J-POWER Group

SUSTAINABILITY REPORT 2010

Harmonizing energy supply with the environment

Harmonizing Energy Supply with the Environment

Following our corporate philosophy "to ensure constant supplies of energy to contribute to the sustainable development of Japan and the rest of the world," the J-POWER Group aims to harmonize our energy supply and the environment in our various business activities.

Editorial Policies

- The J-POWER Group operates under its corporate philosophy of contributing to the sustainable development of Japan and the rest of the world. Accordingly, this report is titled Sustainability Report to express our intention of achieving sustainable growth and development of both the Group and society. It summarizes and reports on the Group's corporate activities under the headings of Governance, Social Responsibilities, and Environment.
- This report includes all consolidated subsidiaries and is representative of the entire J-POWER Group.
- The J-POWER Group's overseas operations are the subject of this year's Special Feature.
- All environmental load and other data, such as the figures for inputs and outputs given in the "Business Activities and the Environment" section, have been calculated for the J-POWER Group as a whole. Joint investments have been accounted for according to the percentage ownership.
- To ensure objective credibility, this report has been independently assured by Ernst & Young Shin-Nihon Sustainability Institute Co., Ltd. (for details, see p. 73).
- Opinions on issues that exist toward the fulfillment of J-POWER's corporate social responsibilities have been drawn from a wide spectrum of experts and journalists with the goal of improving corporate management so that it may contribute to building a sustainable society and of increasing the reliability and transparency of our operations.

Period covered:
April 2009 - March 2010
(January - December 2009 for those companies with a January - December fiscal year. Also, some articles may include content from April 2010 or thereafter.)

Scope: J-POWER and J-POWER Group companies (consolidated subsidiaries)
Note: If other than above, this is indicated in the appropriate place.

Guidelines referred to:
Ministry of the Environment, Environmental Reporting Guidelines: Fiscal Year 2007 Version
Global Reporting Initiative (GRI), Sustainability Reporting Guidelines 2006

Report issued since: 1998

Next report due: July 2011

Note concerning forecasts:
The plans, strategies, and forecasts set out in this report have been formulated based on currently available information. Unforeseeable changes in various factors may cause results to differ from projections.

This report is also available at J-POWER's website as "J-POWER Group Sustainability Report 2010."
Information on business plans and financial data are provided in its Annual Reports.

http://www.jpower.co.jp

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Orange Grove Power Station (U.S.A)

Making full use of half a century of overseas project results and know-how, the J-POWER Group carries out international consulting projects for technical cooperation to develop power sources and protect the environment. Meanwhile, we invest capital and technology in overseas power projects in which we take part.

Governance

Social Responsibilities

Environment

External Evaluation and Outside Opinions

Reference Data

J-POWER Group Overview (As of the end of March 2010)

Company name	Electric Power Development Co., Ltd.
Communication name	J-POWER
Date of incorporation	September 16, 1952
Headquarters address	6-15-1, Ginza, Chuo-ku, Tokyo, 104-8165 JAPAN
President	Masayoshi Kitamura
Capital	¥152.449 billion
Employees	J-POWER: 2,257
	J-POWER Group: 6,701
Business category	Electric Utility

Overview of facilities

● Wholesale power supply

Power generation facilities (output)		
Hydropower stations	59	8.56 GW
Thermal power stations (including 1 geothermal)	8	8.43 GW
	Total 67	16.99 GW
Transmission lines		2,408km
AC power transmission lines		1,973km
DC power transmission lines		267km
Substations	3	4.29 million kVA
Frequency converter station	1	0.3 GW
AC/DC converter stations	4	2 GW

● Other electricity businesses (includes equity method affiliates, but percentage ownership is not taken into account.)

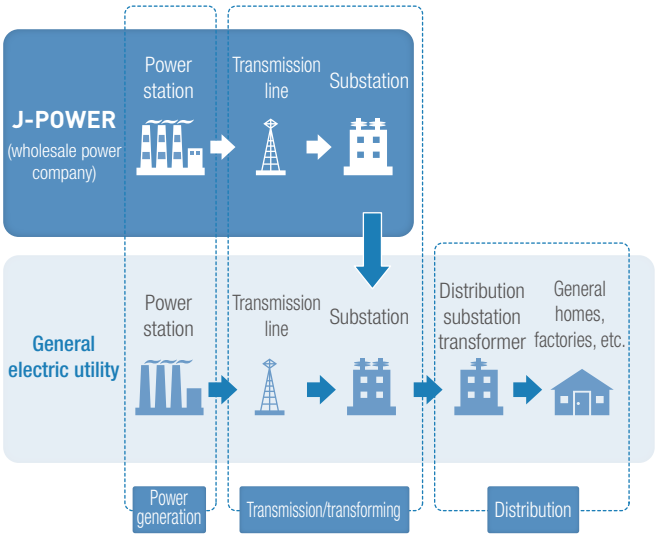
Power generation facilities (output)		
Wind farms	15	0.27 GW
Via independent power producers (IPP)	3	0.52 GW
Wholesale power supply to power producers and suppliers (PPS)	3	0.32 GW
	Total 21	1.11 GW

Profile

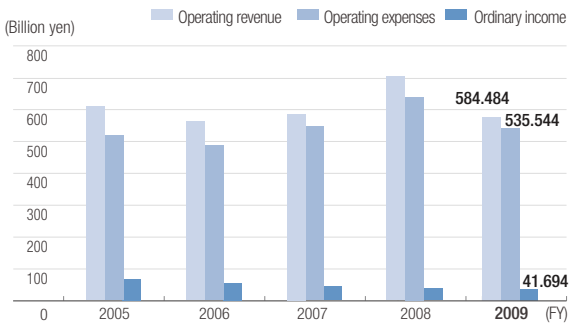
J-POWER was founded as an electricity wholesaler by the Japanese government in 1952 and has a nationwide network of transmission and substation facilities that play a key role in the generation and supply of electricity throughout Japan. Since its establishment, J-POWER has contributed to economic growth and the improvement of everyday life in Japan by providing moderately priced and stable electricity supply to general electric utilities (10 regional power companies).

J-POWER was fully privatized in October 2004, and currently wholesales hydroelectric and thermoelectric power, provides wheeling services through its transmission and substation facilities, and uses its technology and know-how to develop its business in electric power generation overseas and in new energy.

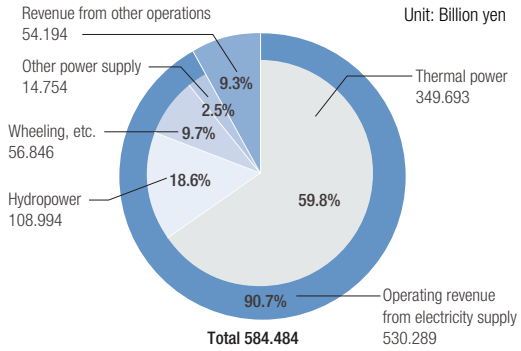
How J-POWER differs from general electric utilities



Consolidated business results

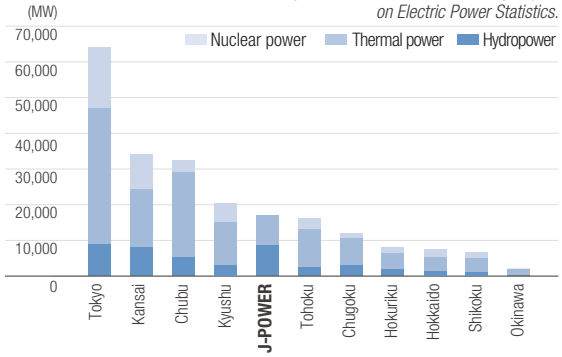


Breakdown of Consolidated Sales

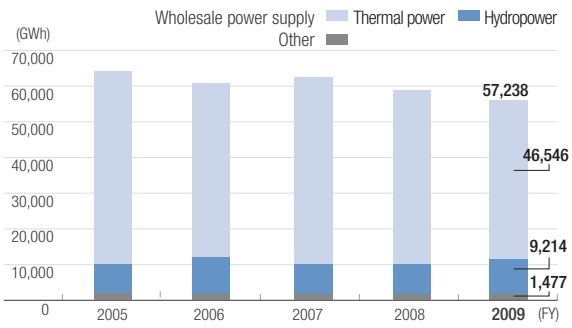


Output of J-POWER and 10 Electric Power Companies

Source: Japan Electric Association, *Monthly Report on Electric Power Statistics.*



Electric Power Sold



Note: Percentage ownership is not taken into account.

Facilities in Japan

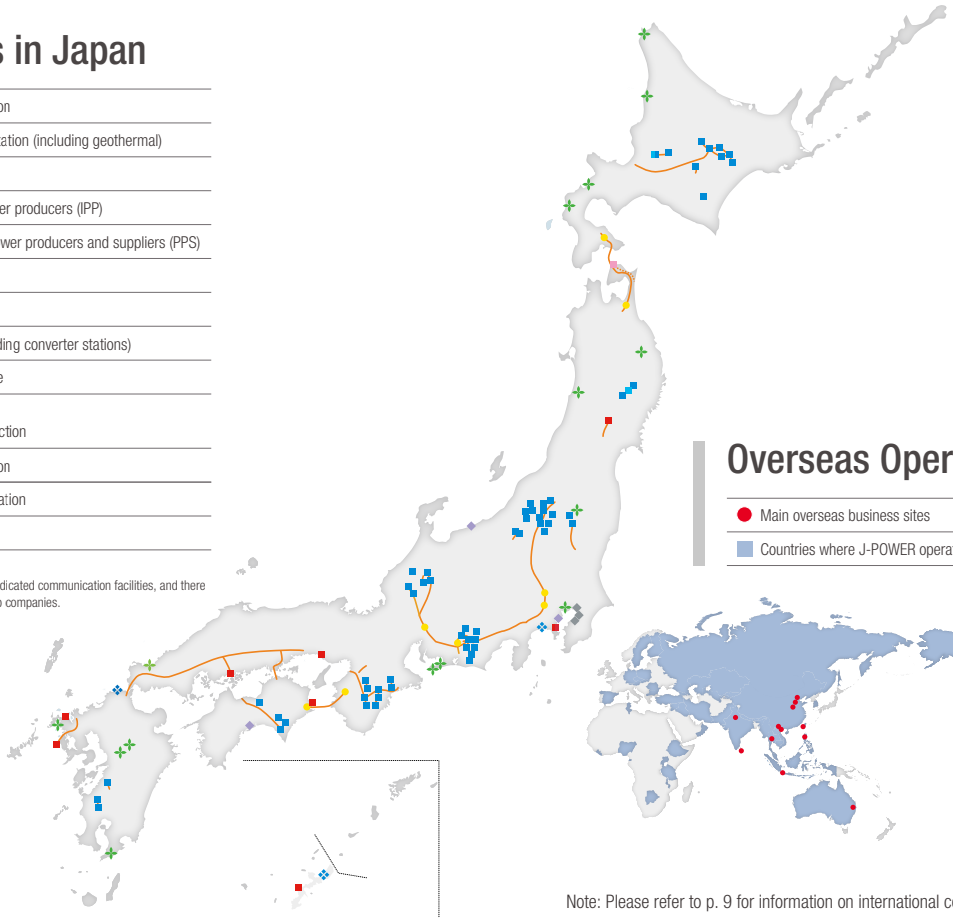
- Hydropower station
- Thermal power station (including geothermal)
- Wind farm
- Independent power producers (IPP)
- Generation for power producers and suppliers (PPS)

- Transmission line
- Substation (including converter stations)
- Research institute

Planned/Under construction

- Hydropower station
- Nuclear power station
- Transmission line

Note: The group also has dedicated communication facilities, and there are facilities owned by group companies.



Overseas Operations

- Main overseas business sites
- Countries where J-POWER operates (including completed projects)

Note: Please refer to p. 9 for information on international consulting and power generation projects.

Major consolidated subsidiaries

Facility design, building and maintenance

JPec Co., Ltd. (Chuo-ku, Tokyo)
JPHYTEC Co., Ltd. (Chiyoda-ku, Tokyo)
KEC Corporation (Bunkyo-ku, Tokyo)
JP Design Co., Ltd. (Chiyoda-ku, Tokyo)
and 10 other companies

Electricity business

Bay Side Energy Co., Ltd. (Chuo-ku, Tokyo)
ITOIGAWA POWER Inc. (Itoigawa-shi, Niigata)
Ichihara Power Co., Ltd. (Ichihara-shi, Chiba)
Green Power Koriyama Nunobiki Co., Ltd. (Koriyama-shi, Fukushima)
and 17 other companies

International business

J-Power Investment Netherlands B.V. (Netherlands)
J-POWER North America Holdings Co.,Ltd. (U.S.A.)
J-POWER Holdings(Thailand)Co.,Ltd. (Thailand)
J-POWER Consultings(China)Co., Ltd. (China)
and 28 other companies

J-POWER Group

84 consolidated subsidiaries

Environment and energy

Omuta Plant Service Co., Ltd. (Omuta-shi, Fukuoka)
and 2 other companies

Affiliated company control

JPOWER GENEX CAPITAL Co., Ltd. (Chuo-ku, Tokyo)

Supply of power generation fuel and equipment

J-POWER AUSTRALIA PTY.LTD. (Australia)
J-POWER RESOURCES CO., LTD. (Chuo-ku, Tokyo)
and 5 other companies

Telecommunications

Japan Network Engineering Co., Ltd. (Chuo-ku, Tokyo)

Service

JP Business Service Corporation (Koto-ku, Tokyo)
and 1 other company

Other

KAIHATSU HIRYOU Co., Ltd. (Takehara-shi, Hiroshima)
and 2 other companies

Message from the President

With the aim of "harmonizing energy supply with the environment" we will put our corporate philosophy into practice, constantly taking up the challenge of developing new technologies and aiming for sustained growth as a global electricity utility that underpins a sustainable society.

Returning to our corporate philosophy

While the world economy has begun to show some signs of recovery, especially in Asian demand, recovery is still unstable in Japan, America and Europe. Moreover, the debate about forming a new international framework to deal with global warming, which would have a deep impact on world economic activity over the long term, failed to yield an effective agreement at the Copenhagen Summit late last year, increasing the confusion.

I believe that the more uncertain the environment outside the J-POWER Group, the more we need to return to our corporate philosophy of aiming "to ensure constant supplies of energy to contribute to the sustainable development of Japan and the rest of the world." The J-POWER Group is constantly enhancing its power generating technologies to be more sustainable, but it is our view that the J-POWER Group will only be able to develop sustainably if society can do so first. To this end, we constantly consider whether we are helping society and whether the members of society believe that we are playing an essential role.

Harmonizing energy supply with the environment is the essential task of the J-POWER Group

Producing electricity inevitably has an impact on the environment. In carrying out our business we have always asked ourselves what we can do to minimize that impact.

The problem of global warming that confronts us today has never before been experienced by humankind. Accordingly, to continue producing energy by exercising knowledge and ingenuity so as to avoid damaging the Earth's environmental capacity, its great ability to tolerate the burdens we place on it, it is essential to pursue the goal of "harmonizing energy supply with the environment." We understand that this task is not only essential, it is the most challenging and chronic problem we face, and as such we are putting every effort into dealing with it.

Deploying knowledge and technologies in a frontier and pioneering spirit to achieve a low carbon society

Humanity is grasping for a new international framework to counter global warming, the ultimate goal of which is the creation of a sustainable low carbon society. To deal with an issue like this with which humankind has no past experience, we need a "frontier spirit" to venture into the unknown and a "pioneer spirit" to open that frontier by being the first to develop new technologies. For the past 50 years, J-POWER has taken on new technologies in its business pursuits. With the frontier and pioneering spirit handed down by our predecessors, we accept the challenge of achieving a low carbon society through knowledge and technologies.

To that end, the first task for the J-POWER Group is to radically enhance the efficiency of coal use for power generation. Among fossil energy resources, coal is the most abundant and stable fuel for power generation, accounting for around 40 percent of power produced worldwide. To ensure a global energy supply-demand balance, it will remain essential to use coal. In view of this, we must transfer Japanese high-efficiency coal-fired thermal power generation technologies, which rank among the finest in the world, to countries that are obliged to depend upon coal for a considerable portion of their energy requirements, while continuing to refine our own technologies in domestic power stations. I believe that this will contribute to the reduction of CO_2 emissions on a global scale.

In addition, I consider nuclear power, which produces no CO_2 emissions during actual generation, to be of decisive importance for mitigating global warming. In view of its immense power

output, the Ohma Nuclear Power Station (Shimokita-gun, Aomori Prefecture), where construction began in May 2008, is expected to make a major contribution to reducing Japan's CO_2 emissions. With operations scheduled to start in 2014, we continue steadily building the station while making scrupulous efforts to ensure safety and conserve the surrounding environment.

Assuring facility reliability and strengthening our business foundation

Stable operation of our power plants and other electric power facilities is essential to stable profitability in the domestic wholesale electricity business—our Group's main profit center—and mandatory if we are to fulfill our responsibility for a stable supply of electric power. In light of physical problems that are on the rise in recent years as our facilities age, we must do all we can to better diagnose facilities and practice preventive maintenance. J-POWER Group is working to optimize facility maintenance economically over the long term and strengthening its business foundation so that we may simultaneously attain facility reliability and cost competitiveness.

Earning greater trust from our stakeholders

To meet the expectations of the diverse stakeholders who support us, it is our duty to continue to give close consideration to their interests and to ensure that they benefit from the fruits of our business activities. One means of gaining their confidence is to genuinely share with all Group employees the J-POWER Group's corporate philosophy of ensuring constant supplies of energy to contribute to the sustainable development of Japan and the rest of the world and to put it into action. The new value that is to be returned to stakeholders is created by our employees, who are also stakeholders. I pledge that by putting the corporate philosophy into action, I, together with all Group employees, will make every effort to win the even greater trust of all stakeholders.

To earn your greater trust by deepening communication with you and to enhance the quality of our business efforts, we are making this Sustainability Report widely available. We would be delighted to receive your frank opinions.

July 2010

President

北村雅良

Masayoshi Kitamura

J-POWER Group's Corporate Social Responsibility

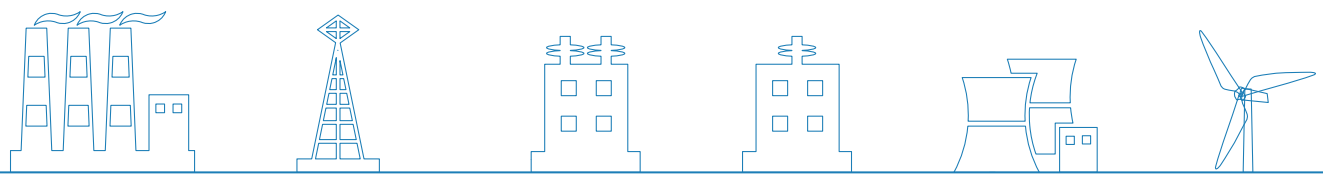
Our corporate philosophy calls for ensuring constant supplies of energy to contribute to the sustainable development of Japan and the rest of the world. This is fundamental to our ongoing efforts to deliver efficient, reliable electricity while conserving the environment. It is this corporate philosophy that forms the basis of our social responsibility. In addition, the J-POWER Corporate Conduct Rules have been laid down as standards for the conduct of business grounded in our corporate philosophy. Individual Group companies also have policies relating to their own responsibilities to society.

We endeavor to fulfill our corporate social responsibility by adhering to our corporate philosophy and Corporate Conduct Rules as we press forward in our operations.

J-POWER Group Corporate Philosophy (Established September 11, 1998)

We aim to ensure constant supplies of energy to contribute to the sustainable development of Japan and the rest of the world.

- Sincerity and pride underlie all our corporate activities.
- We build community trust by harmonizing our operations with the environment.
- Profits are a growth source, and we share the benefits with society.
- We continuously refine our knowledge and technologies to be a leader in these areas.
- We meet the challenges of tomorrow by harnessing our unique skills and enthusiasm.



J-POWER Group Corporate Conduct Rules (Established January 1, 2001)

» Reliable supply of energy
We will put forth every effort to reliably supply energy both in Japan and abroad utilizing our experienced personnel and cutting-edge technology.

» Safety assurance
In conducting operations we will constantly work to raise safety awareness and give the highest priority to public and worker safety.

» Environmental conservation
Based on an awareness that our business operations are deeply linked with the environment, we will actively engage in environmental conservation activities.

» Communication with society
To establish communication with society we will conduct information disclosure and public relations activities in a fair and transparent manner.

» Contribution to society
Aiming to be a good corporate citizen we will undertake activities to contribute to society and assist in the development of local communities both in Japan and abroad.

» Creation of a rewarding corporate culture
In addition to providing safe and comfortable work environments, we will respect the individuality of our employees and endeavor to establish a rewarding corporate culture that encourages them to take on new challenges.

» Compliance with laws, regulations, and corporate ethics
We will conduct business in good faith and in a fair manner with a strong commitment to compliance and ethics. We will stand firm against anti-social forces that undermine the order and security of civil society.

» Role of top management
Recognizing their responsibility in putting into practice the spirit of these Corporate Conduct Rules, our top management must set an example for others and work to spread awareness of these Rules.

Should an event occur that violates the spirit of these Rules, top management must take the initiative in dealing with the problem to determine the causes and prevent recurrence. Top management must also identify and take disciplinary action against those responsible, including themselves.

J-POWER Group's Corporate Social Responsibility and Principal Themes of Action Taken

The J-POWER Group carries out its responsibilities to society in line with its corporate philosophy, living up to the expectations of the diverse stakeholders who support it. The following is an outline of the principal themes of the action it has been taking.

Corporate Philosophy	Theme	Principal Action Taken	Ref.
Sincerity and pride underlie all our corporate activities.	Stable supply of electric power	Ensuring availability by proper facilities maintenance	Social Responsibilities
	Enhancement of internal controls	Enhancing the corporate governance structure Thorough regulatory compliance	Governance
	Gaining of the trust of society	Conducting appropriate information disclosure Giving attention to safety in all business activities	Governance Social Responsibilities
We build community trust by harmonizing our operations with the environment.	Efforts Relating to Global Environmental Issues	Reducing CO_2 emissions intensity Maintaining and improving thermal efficiency of thermal power generation	Environment
	Efforts Relating to Local Environmental Issues	Reducing emissions of SOx, NOx, etc. Promoting waste recycling Initiatives to protect biodiversity	
Profits are a growth source, and we share the benefits with society.	Return of value to shareholders	Maintaining stable dividends and raising them in line with growth performance	Social Responsibilities
	Contribution to society as a whole	Instituting the J-POWER Group Approach to Social Contribution Activities	
We continuously refine our knowledge and technologies to be a leader in these areas.	Nurturing of human resources	Enhancing ability to conduct business by improving basic knowledge and professional capabilities	
	Promotion of innovation	Human-resource development and organizational structure to foster creation of new concepts	
We meet the challenges of tomorrow by harnessing our unique skills and enthusiasm.	Enhancement of workplace environments	Promoting work-life balance	
	Active participation by diverse human resources	Creating workplace environments and systems that facilitate active participation by senior citizens and women	

Notes:
1. The J-POWER Group fiscal 2010 management plan is on the Company website.
   (Japanese) http://www.jpower.co.jp/annual_rep/ann20000
   (English) http://www.jpower.co.jp/english/news_release/news/news100331_2.pdf
2. The J-POWER Group's environmental management targets are set out on pp. 41- 42 of this report.

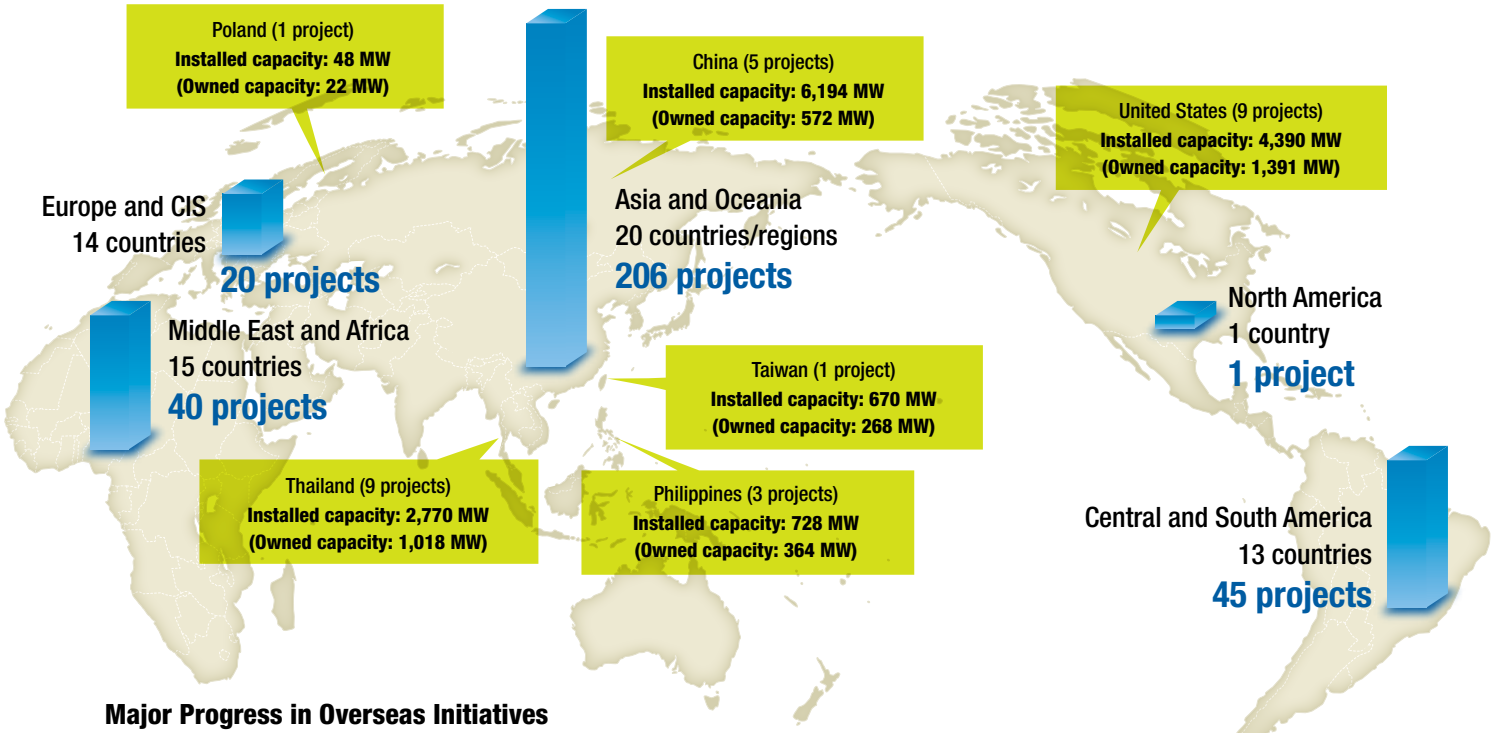
Overseas Operations

Making full use of half a century of overseas project results and know-how, the J-POWER Group carries out international consulting projects for technical cooperation to develop power sources and protect the environment. Meanwhile, we invest capital and technology in overseas power projects in which we take part.

International Consulting Projects
312 in 63 countries/regions .....

Overseas Power Projects
28 in operation in 6 countries/regions .....

Note: As of March 31, 2010



Major Progress in Overseas Initiatives

1960	Overseas Technology Cooperation Department established
1962	Tacna Hydropower Project (Peru)
1967	Quae Yai No.1 (Srinagarind) Hydropower Project (Thailand)
1969	Hasan Ugurlu Hydroelectric Power Project (Turkey)
1987	1,000 MW Coal-Fired Thermal Power BOT Project (Turkey)
1990	Lam Ta Khong Pumped Storage Power Project (Thailand)
	Masinloc Coal-Fired Thermal Power Project (Philippines)
1994	Ham Thuan Hydroelectric Power Project (Vietnam)
1997	Establishment of International Power Development Office in International Activities Department
	Investment in small-scale projects in Thailand and China
2002	Establishment of holding company in Netherlands
	Equity participation in Chiahui Power Corporation (Taiwan)
2003	Start of commercial operation of Rayong Gas-Fired Thermal IPP* Project (Thailand)
2005	Establishment of local corporation in US
	Purchase of share of CBK Power Plants (Philippines)
2006	Acquired equity in Tenaska Frontier Power Plant (US)
	Establishment of local corporation in Thailand
	Acquired equity in Elwood Energy Power Plant (US)
2007	Start of operation of Kaeng Khoi 2 Power Station No. 1 unit (Thailand)
2008	Start of operation of Kaeng Khoi 2 Power Station No. 2 unit (Thailand)
	Establishment of local corporation in China
	Decision to participate in large-scale Xinchang Coal-Fired Power Generation Project (China)
	Acquired equity in Birchwood Power Station (US)
	Establishment of Department of International Business
2009	Acquired equity in Nhon Trach 2 Power Plant (Vietnam)
	Acquired equity in two Long Island Power Plants (US)
	Started construction on Orange Grove Power Station (US)
	Acquired equity in Gemeng International Energy Co., Ltd. (power generating business in Shanxi Province) (China)
	Concluded Power Purchase Agreement for seven SPP* Projects (Thailand)
	Accepted joint consulting assignment concerning decision on hydropower development master plan (Uganda)

* IPP (Independent Power Producer)
A business, other than a wholesale power supplier, that supplies electricity to general electric utilities.

* SPP (Small Power Producers)
A system that guarantees purchases of power from small-scale power producers; it promotes the introduction of cogeneration and other energy-efficient equipment.

International Consulting Projects around the World

— J-POWER Technology Earns Trust Overseas —

The J-POWER Group's overseas operations began with our entry into the field of international technology cooperation, which was prompted by revisions to Japan's Electric Power Development Promotion Law in 1960. All along, we have used the technology and trust developed in Japan to support sustainable development.

Starting with the Tacna Hydropower Project in Peru in 1962, our track record in international consulting projects over nearly 50 years stands at 312 total projects in 63 countries/regions as of the end of fiscal 2010.

For many years and in countries around the world, our international consulting projects have drawn on our technologies and experience in hydropower and thermal power to assess environmental impacts, transfer technology for removing sulfur and nitrogen during coal-fired power generation, and plan, design and supervise the construction of hydropower plants.

Recent jobs in new markets and fields include work on Photovoltaic System Demonstration Project in Brunei and an energy-saving survey for Asia and the Middle East. In 2009, we won a commission from the Japan International Cooperation Agency (JICA) to provide support for the process of setting a Project for Master Plan Study Hydropower Development in Uganda, Africa.

These international consulting projects will help our host countries develop a stable supply of energy into the future and reduce environmental burdens by first surveying socioeconomic conditions and energy consumption and demand trends in the countries and then transferring technology from our experience and knowledge through individual projects.

Upper Kotmale Hydropower Project

The Upper Kotmale Hydropower Project is currently under construction in the Nuwara Eliya District in the center of Sri Lanka, a country famous for its tea. The project is scheduled for completion in 2011. J-POWER is providing engineering services such as plant construction supervision with a staff of 60, including 10 Japanese on long-term assignment and local engineers and staff members.

An intake dam under construction

With few fuel resources like coal, oil or natural gas, Sri Lanka has to depend on imports of these commodities. In the mountainous center of the country, however, Sri Lanka long ago began developing hydroelectric power as a valuable domestic resource.

J-POWER's staff explaining their plan to the president of Sri Lanka (center)

In recent years, along with the country's economic development, Sri Lanka's demand for electric power is growing rapidly, at an estimated 8% annually. To meet this demand, the Upper Kotmale Hydropower Project will channel water through a 12 km headrace tunnel from a dam upstream of the existing Kotmale power plant and generate a maximum of 150 MW using a head of about 500 m.

Together with a 900 MW coal-fired thermal base power source under construction in the west of the island nation, this ranks as one of the most important national projects for the future of Sri Lanka.

● Recent Major International Consulting Projects

Country	Project	Type	Description
India	Thermal Power Plant Operational Improvement Project	Thermal	Facility and thermal efficiency diagnostics at existing coal-fired thermal power station
Indonesia	Keramasan Thermal Power Station Expansion Project	Thermal	Construction bidding support and construction supervision for combined cycle power station
Indonesia	Demand Side Management Promotion	Other	Energy-saving promotion study
Uganda	Project for Master Plan Study Hydropower Development	Hydropower	Hydropower development master plan decision support
Cambodia	The Project for Operation and Maintenance of the Rural Electrification on Micro-Hydropower in Mondul Kiri	Hydropower	Operating technology advice for two small-scale hydropower stations and one diesel power station
Sri Lanka	Upper Kotmale Hydropower Project	Hydropower	Bidding support and construction supervision for dam and power station
Sri Lanka	Colombo Transmission and Substation Development Project	Power transmission and transformation	Construction of additional substations, establishment of new distribution lines, construction supervision of installation of remote monitoring and control systems, etc.
Sri Lanka	Energy Conservation Promotion	Other	Support for deciding on and implementing policies for promoting sustainable energy-saving activities
China	Thermal Power Plant Facility Diagnosis Project	Thermal	Performing facility diagnostics at existing coal-fired thermal power station, proposing efficiency improvement measures, etc.
Brunei	1.2MW Photovoltaic System Demonstration Project	Solar	Procurement support and construction supervision for solar power facilities
Vietnam	Son La Hydroelectric Power Project	Hydropower	Hydropower station and dam construction supervision
Vietnam	Bac Ai Pumped Storage Hydropower Project	Hydropower	Support for designing a pumped storage power station construction feasibility study
Vietnam	Nghi Son Thermal Power Plant Project Phase 1	Thermal	Construction bidding support and construction supervision for thermal power station
Vietnam	Electric Power Technology Standards Promotion Project	Other	Support for amending/establishing electric power technology standards and deciding on guidelines
Myanmar	Ministry of Agriculture and Irrigation In-House Consultant	Hydropower	Design and construction supervision for Kyeon Kyeewa dam and nine other dams and power stations

An Active Part in Overseas Power Generation

— Building a "Second Pillar" of Management —

We began our business in overseas power generation in 1997 with the establishment of the International Power Development Office. Using the experience, trust and networks the J-POWER Group has built up in its consulting projects and responding to the subsequent deregulation of the electricity business around the world, we participate in a variety of overseas power generating projects. We use technologies for boosting power station efficiency and protecting the environment to pursue our business in environmentally friendly and economical ways.

Through our overseas power generating business, we contribute to the sustainable development of nations and regions like Thailand, the US, China, Taiwan and the Philippines. Moreover, we are helping to use resources more efficiently and reduce CO_2 emissions through China's Tianshi Power Plant (running on waste coal), Thailand's Roi-Et Power Plant (using rice chaff as fuel) and Yala Biomass Power Plant (using waste from rubber-wood sawmills), and Poland's Zajaczkowo Windfarm.

As of March 31, 2010, we have 28 international power generation projects in six countries or regions with owned capacity of about 3,630 MW.

Thailand

Steadily Pursuing Projects to Keep up with Growing Demand

Thailand has allowed private capitalization in the power generating sector since 1992 as it seeks to diversify its electricity business. Starting in 2000, the J-POWER Group has been working with independent power producers (IPPs) in Thailand to keep up with the power demand in that country, which continues to grow from both industry and citizens. By taking part in numerous IPP*1 and SPP*2 projects, we are improving the electric power situation in Thailand and promoting its economic development with both funding and technology.

Roi-Et Power Plant burning rice chaff as fuel

Particularly, the Kaeng Khoi 2 Power Station (output 1,468 MW, high-efficiency gas-turbine combined-cycle generation*3), which began commercial operation in Thailand in 2008, is helping to provide a continuous, stable supply of electric power as one of the most important electricity providers in the country (currently providing about 8% of all electric power consumed).

Kaeng Khoi 2 Power Station

And in addition to the conventional electricity business, we are developing and advancing biomass*4 power generation to make effective use of untapped resources and reduce CO_2 emissions at the Roi-Et Power Plant using rice chaff as fuel (Northeast Thailand, output 10 MW) and Yala Biomass Power Plant using waste from rubber-wood sawmills (Southern Thailand, output 20 MW).

We are currently developing IPPs in two locations (with 1,600 MW of output each) and SPPs in seven locations (about 110 MW each).

U.S.A

Yielding Steady Results in an Environment Totally Different from Asia

The J-POWER Group has been wholeheartedly pursuing business in the US since we set up a local affiliate in 2005. We currently have nine power stations in the country with owned capacity of about 1,400 MW, accounting for some 40% of our operating assets outside Japan.

Although most of our overseas power generating business has been in the high-growth region of Asia, the US offers features different from the Asian market, such as the relatively advanced state of its electricity business system, the universality of its currency, and the maturity of its generating assets sales markets. Having business in the US as part of our portfolio is significant also for our business pursuits in Asia.

Orange Grove Power Station

Also, being relatively unknown in the US at the time of our market entry there made it more of a struggle for the J-POWER Group than in Asia. In the process, we had to work hard to gain access to many projects, build networks with other enterprises and bring talent on board, but these efforts have paid off well.

Recently, we finished our first construction project in the US, the Orange Grove Power Station in California, a state with very stringent environmental protection rules. This has been a valuable experience for us. We will use this asset to conduct our next project in a sustained initiative to provide a stable supply of electric power in the US.

China

Using High-Efficiency Coal-Fired Thermal Power Technology to Reduce Environmental Burdens

With its rapid economic development, China has brought some 60,000 - 100,000 MW of new power sources online since 2002, and most of this has come from coal-fired thermal power plants. Most of the conventional thermal power stations, however, have been of very small scale (100 MW or less), making them inefficient and unsatisfactory for protecting the environment. To improve the situation, the Chinese government has adopted a policy of building larger power stations and reducing the number of small ones to increase generating efficiency and mitigate environmental burdens in the nation as a whole.

The J-POWER Group has done consulting projects in China for over 30 years and is also a partner in power generating projects. Using our track record and advanced power generating technology, we are currently involved in the development and operation of many power stations.

The J-POWER Group is working to expand high-efficiency coal-fired thermal power in China. The coal-fired Tianshi Power Plant (Shanxi Province) is operating stably at a high usage rate. The coal-fired Xinchang Power Plant (Jiangxi Province) using ultra super critical (USC)*5 technology, built cooperatively with the Chinese state electric company, began commercial operation in FY 2009. We have also invested in the Gemeng International Energy Co., Ltd. (Shanxi Province). Also, in the area of renewable energy, commercial operation has begun at the Shuhe Hydropower Plant (Shaanxi Province) No. 1 turbine in the Han River Basin.

Because some environmental problems have no borders, the J-POWER Group will continue to spread its technology to contribute to sustainable development.

The coal-fired Tianshi Power Plant

Asia

Projects Underway in the Philippines, Taiwan, Vietnam and Beyond

CBK Power's Kalayaan pumped-storage hydropower station (Philippines)

Aside from Thailand and China, the J-POWER Group is also undertaking overseas power generating projects in the Philippines, Taiwan, Vietnam and other parts of Asia.

CBK Power in the Philippines is the J-POWER Group's first hydropower IPP project, consisting of three facilities: the Caliraya and Botocan ordinary hydropower stations and the Kalayaan pumped-storage hydropower station. The Group is an investor in this project and additionally in charge of operations and maintenance. As such, we instruct local engineering staff and endeavor to run the project stably. As the Philippines' only pumped-storage power plant, Kalayaan in particular helps adjust supply to demand fluctuations and plays a big role in stabilizing the power system.

Chiahui Power of Taiwan is a high-efficiency gas-turbine combined-cycle power generation project we are undertaking jointly with Asia Cement Corporation of Taiwan. In this project the J-POWER Group helped to build the plant and gave technical support during its early operation, and since then we have continued to post staff locally. Through our active engagement for the company's sound management and stable operation, we are contributing to the stable supply of electric power in Taiwan.

Gas-fired Chiahui Power Plant (Taiwan)

In Vietnam, we invested in the Nhon Trach 2 power station in 2009. This gas-turbine combined-cycle power generation project is currently under construction. We are providing technical and other support with the aim of beginning commercial operation in 2011.

References

*1 IPP (Independent Power Producer)
A business, other than a wholesale power supplier, that supplies electricity to general electric utilities.

*2 SPP (Small Power Producers)
A system that guarantees purchases of power from small-scale power producers; it promotes the introduction of cogeneration and other energy-efficient equipment.

*3 Gas-turbine combined-cycle generation
A power generation method combining gas turbines and steam turbines. The pressure of the exhaust gas created when the fuel is burned within compressed air drives the gas turbine, and the residual heat is used to run the steam turbine. Combining these two processes results in high generating efficiency.

*4 Biomass
Renewable organic resources of plant and animal origin other than fossil fuels regarded as CO_2-free.

*5 USC (Ultra Super Critical)
A steam turbine technology that makes use of advanced steam conditions, beyond those used in conventional super critical turbines (pressure 22.1 MPa; temperature 566ºC), to improve the efficiency of thermal power stations.

For Global Sustainable Development

— Pursuing Our International Business Hereafter —

The J-POWER Group is stepping up the effort to turn our overseas power generating business into our "second pillar" of management. This reflects the trend toward privatizing and deregulating the electricity business around the world in recent years. As IPP systems become mainstream, there are increasing opportunities for participating in overseas power generation in places like Asia where demand is expected to grow sharply.

In addition to our experience in the electricity business for more than half a century in Japan, the J-POWER Group has built up experience, trust and networks in overseas consulting projects in 63 countries and regions over some 50 years, and we actively use these to discover and develop projects in this field.

So far, we have 28 IPP projects in commercial operation in six countries and regions with owned capacity of about 3,630 MW, and in the future we will continue to step up these business activities, especially in Thailand and other parts of Southeast Asia as well as the US and China.

Our international consulting also includes ongoing planning of studies on building new hydropower and thermal power plants in Vietnam, India and other Asian nations, conducting an electric power technology standards writing study, hosting trainees from abroad and dispatching government specialists to Laos and Nepal as well as working on effective energy conservation projects as a way to reduce CO_2 emissions.

As a stable supply of energy and countermeasures to global warming become more important worldwide, we will continue to follow our corporate philosophy "to ensure constant supplies of energy to contribute to the sustainable development of Japan and the rest of the world," and use the environmental conservation measures technology and high-efficiency operation know-how that we have developed as the largest coal-fired thermal power generator in Japan to transfer our technology in the fields of overseas power generation and international consulting.

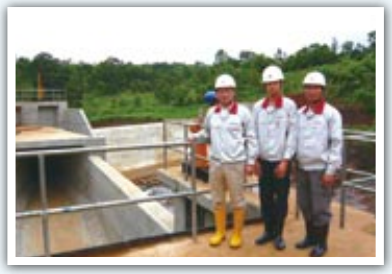
In Japan, we will continue to develop and prove the latest high-efficiency power generating technology and operate working facilities, and will use the results of those efforts overseas, especially in Asia, to help reduce world emissions of CO_2.

COLUMN

The Project for the Rural Electrification on Micro-Hydropower in Mondul Kiri

Cambodia's long internal turmoil destroyed much of its existing facilities, slowing down the nation's development, so that even now only about 20% of all households there receive electricity. One of the least developed regions is Mondul kiri Province, 400 km from the capital. In Sen Monorom (population approx. 9,000), though it is the provincial capital, the local private enterprise is only able to supply electric power to a limited number of shops for a few hours in the morning and evening, and most residents have to depend on lamps and batteries. Since 2004, with support from the Japanese government, the J-POWER Group has not only been designing and building a project to use renewable small-scale hydropower generation to electrify entire villages but also has given technical instruction in electric power operation and maintenance, which is primarily done by local citizens.

Diversion weir at O'Romis power station



J-POWER employee (left) and local staff

Isogo Thermal Power Station (Yokohama)

Governance

Enhancing Corporate Value

Enhancing Corporate Value

The J-POWER Group is committed to addressing changes in society and being worthy of the trust held in it by its diverse stakeholders. To that end, we are taking steady steps to build and operate a structure needed to ensure enhanced corporate governance.

Corporate Governance

Based on its corporate philosophy of aiming "to ensure constant supplies of energy to contribute to the sustainable development of Japan and the rest of the world," the J-POWER Group recognizes that the enhancement of corporate governance and thorough implementation of regulatory compliance are highly important management issues for achieving long-term corporate growth and enhanced corporate value and winning the trust of its stakeholders.

Corporate Governance Framework

In accordance with the J-POWER Group corporate philosophy, J-POWER directors and corporate auditors take the initiative in giving guidance on honest and fair activity based on an unswervingly law-abiding spirit and ethical attitude in accordance with the J-POWER Corporate Conduct Rules. At the same time, they promote efforts to instill this attitude in all J-POWER employees.

At J-POWER, directors who are thoroughly familiar with our operations are put in charge of executing those operations, while non-executive outside directors who take part in management decisions from an independent point of view attend meetings of the Board of Directors. Under this system, directors supervise each other. We also believe that our corporate governance functions extremely well, as our corporate auditors, including outside auditors with a wealth of experience managing some of Japan's leading public companies and working in fiscal policy, attend meetings of the Board of Directors and other management meetings and therefore constantly monitor the execution of duties by the directors.

Going further, in March 2010 following changes in the Tokyo Stock Exchange's securities listing rules, we designated one external director and all three external auditors as independent officers. The high level of independence of these officers keeps them from having any conflict of interest with ordinary shareholders.

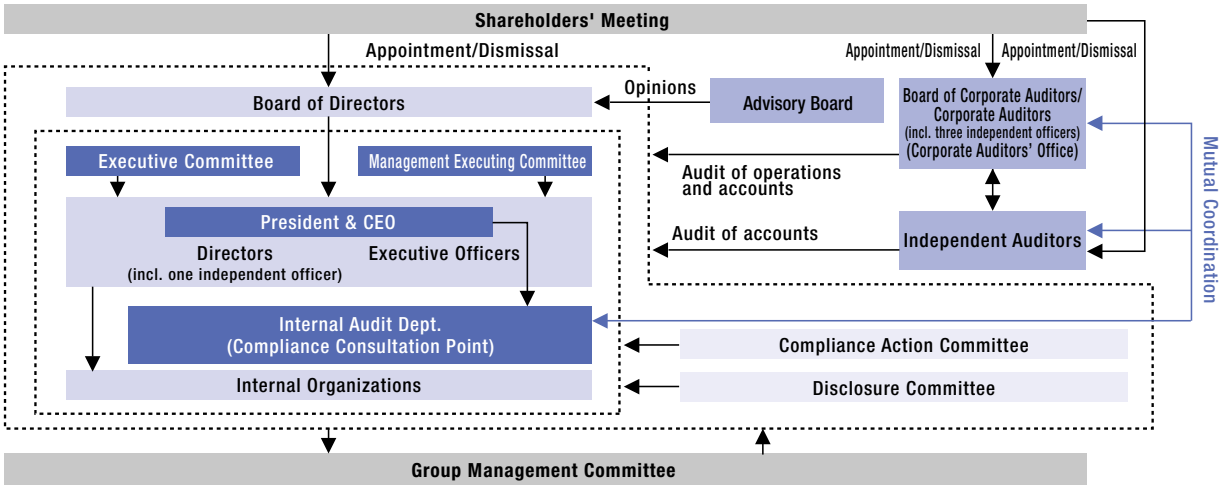
■ Execution of Business and System of Audits and Supervision

To ensure that directors' duties are carried out efficiently, functions have been allocated to bodies other than the Board of Directors. Specifically, the Executive Committee has been established to deliberate on specific matters, in particular matters of key importance to the Company as a whole from among those being handled by the president in accordance with policies decided on by the board, and the Management Executing Committee deliberates on important matters relating to specific aspects of business execution. In addition, the system of executive officers has apportioned the execution of business among directors and executive officers. This has clarified responsibilities and authority, enabling precise and prompt decision-making and efficient corporate management.

J-POWER's Board of Corporate Auditors comprises five auditors. Three of these are outside auditors, and since July 2008, one of these has had the status of a standing auditor, in order to enhance still further the oversight functions of the Board of Corporate Auditors.

To ensure that the corporate auditors' auditing is carried out effectively, the directors have created an environment in which corporate auditors attend and state their opinions at meetings of the Board of Directors, the Executive Committee, and the Management Executing Committee, hear descriptions from directors and others concerning the state of business execution, inspect internal Company organizations and major subsidiaries, and engage in smooth mutual coordination with accounting auditors and others.

● The J-POWER Group's Corporate Governance Framework



References

In addition to these supervisory and oversight functions, J-POWER's Internal Audit Department conducts internal auditing independent of other Company units. On top of this, each Company unit conducts periodic voluntary audits of its own operations.

■ Other Structures

With regard to disclosure, to improve the accountability and transparency of its corporate activities the Company has established the Disclosure Committee, chaired by the president, which ensures that the disclosure of the Company's information is vigorous, fair, transparent, and timely.

The J-POWER Advisory Board was established in September 2008 as part of the Company's measures to enhance corporate governance. The Advisory Board allows outside experts to provide diverse and objective opinions and uses them to enhance corporate value.

With regard to the administration of subsidiaries and affiliates, J-POWER's basic policy calls for Group-wide development in accordance with the Group's management plan. In addition to the administration of subsidiaries based on company regulations, we have set up a Group Management Meeting to enhance the fairness of business activity within the corporate group.

■ Response to Internal Control Reporting System on Financial Reporting

In the J-POWER Group, our Accounting & Finance Department and Internal Audit Department head up our "Internal Control Reporting System on Financial Reporting" as required under the Financial Instruments and Exchange Law, preparing, operating and evaluating the internal control system.

In FY 2009, as in the year before, executives evaluated the state of preparation and operation of the items "company-level internal control," "business process internal control" and "IT-based internal control" as based on the implementation standards set by the Financial Service Agency. The results indicated that our internal control on financial reporting was effective.

The evaluation results were summarized into an internal control report, examined by an auditing firm and submitted to the Kanto Local Finance Bureau Director-General at the end of June 2010.

The whole Group is committed to ongoing enhancement of its internal control systems and to ensuring the reliability of its financial reporting.

Emergency Management Structure

The risks inherent in J-POWER's business environment are becoming increasingly diverse and complex, requiring us to take responsibility for forecasting the various risks accurately and to manage them appropriately in the event they emerge. In view of this, J-POWER has prepared itself for risk by putting the following structure in place.

1. Emergency Response Team

(1) To deal with emergency management during periods of normality, the Emergency Response Team made up mainly of the General Affairs Dept. and Secretarial Affairs & Public Relations Dept. and other related departments is established permanently at the head office to predict emergencies, conduct rapid first response when they do occur, and take overall charge of emergency management.

(2) The Emergency Response Team manages the following matters.

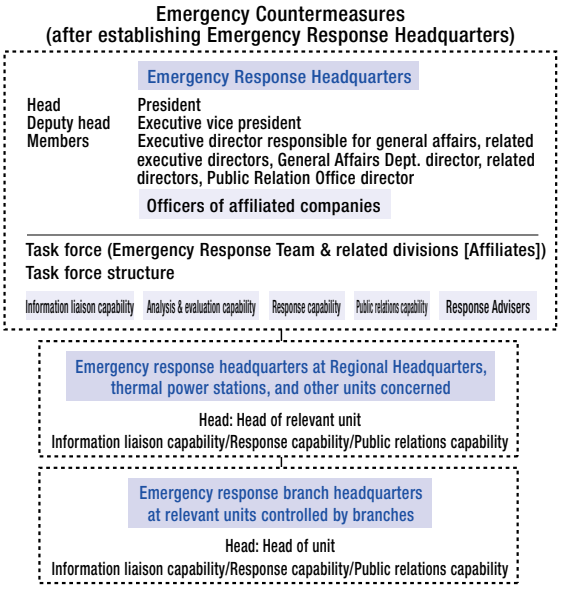
- Prediction of emergencies and rapid first response when they do occur
- Risk identification, gathering and management of risk information
- Education and training

2. Emergency managers and emergency duty personnel

Emergency managers and duty personnel are appointed in each head office division and local unit, and these undertake rapid first response and transmission of information.

3. Emergency Response Headquarters and branches

When emergencies are predicted and occur, and their seriousness warrants emergency countermeasures, the Emergency Response Headquarters (and branches) are established promptly (see chart below).



4. Overseas emergency response task force

The overseas emergency response task force has been established under the Emergency Response Team in line with the expansion of the scale of J-POWER's business outside Japan. Its activities also include the gathering of information relating to emergencies overseas.

What Emergencies Mean for J-POWER Group

For the J-POWER Group, a variety of events are regarded as being emergencies.

As a wholesale power company the greatest emergency for J-POWER is the malfunctioning of equipment that produces electricity, its product upon which companies depend for their very existence. The causes of equipment malfunctions include natural disasters, man-made causes, and physical causes.

(1) Malfunctions caused by natural disasters

Natural disasters such as earthquakes, typhoons, lightning strikes, tsunami, and volcanic eruptions are not able to be prevented by artificial means, though it is possible to minimize the damage they cause through the use of appropriate equipment and systems for disaster recovery. J-POWER takes precautions against the risk of natural disasters by such means as having systems in place to restore equipment functions as rapidly as possible when such natural disasters affect the maintenance and operation of facilities such as those for power generation and transmission, substations, and control centers (for remote operation of power stations), and conducting reinforcement engineering works that incorporate state-of-the-art earthquakeresistant design concepts. In addition, the Company fosters emergency-management awareness among its employees by conducting regular disaster-prevention drills.

(2) Malfunctions from man-made causes

With the exclusion of crises that it is impossible for a single company to address alone, the Company addresses warfare, terrorism involving acts of destruction, malicious acts, and other forms of crisis caused by human activity to avoid them as much as possible by such means as making every effort to gather relevant information, liaising with relevant authorities, and building a liaison structure for times of crisis. In addition, power transmission pylons close to public thoroughfares are fenced off and inspected and examined regularly.

(3) Malfunctions from physical causes

J-POWER's electricity generation, transmission, substation, and communications equipment was in some cases installed more than 50 years ago, and thus a significant proportion of it is aging. Equipment whose functioning deteriorates and suffers damage is repaired or renewed as necessary, and daily inspections and examinations are conducted to ensure that they do not give rise to significant obstacles to power supplies. In addition, risk is avoided by means of regular overhauls and meticulous inspections to check the performance of key parts and equipment, and the implementation of preventative maintenance to avoid equipment malfunctions.

Disaster Prevention Measures

In recent years, natural disasters such as major earthquakes and torrential rains due to abnormal weather have been occurring frequently. J-POWER is an electric power supplier with responsibility for the nation's vital lifelines, and has the status of a designated public institution under the Disaster Countermeasures Basic Act and the Civil Protection Law.

In view of this, the Company has long been developing disaster prevention measures and has formulated and announced operational plans for disaster prevention and plans for measures to protect the people. In this way, J-POWER has aimed to be a company that is resilient to disasters.

In-house manuals for responding to disasters, including a set of rules on disaster countermeasures and protection measures for the people, have been prepared, and the Company has built a disaster prevention structure that encompasses head office and all Group units in each region systematically. In addition to the creation of this structure, disaster drills are held regularly in every unit to improve its practical ability to deal with actual disasters so that emergency situations can be handled appropriately.

Response to New Strains of Influenza

J-POWER adopted a "New Strains of Influenza Action Plan" in April 2007 and has devised countermeasures to new strains of influenza based on this.

New Strains of Influenza Action Plan (excerpt)

1) Purpose of action plan

The purpose of this action plan is to help J-POWER accurately and promptly respond, as based on the national government's "Guidelines for Pandemic Influenza Preparedness at Business Entities and Establishments," in the event of an epidemic of a new strain of influenza, so that we can continue to supply electric power stably with safety as the top priority.

2) Risk management system and information gathering

3) Business operations system in the event of an epidemic of a new strain of influenza

4) Measures for preventing infection of employees, etc.

5) Measures for preventing spread of infection in offices, etc.

COLUMN

Activities of the Disaster Prevention Task Force

Given the frequent occurrence and growing severity of natural disasters since the Chuetsu Earthquake in Niigata Prefecture in 2005, the Disaster Prevention Task Force was established as a cross-functional organization straddling all related divisions. It brings together the Company's knowledge in a broad range of spheres such as civil engineering and construction, studying and implementing measures to protect Company power generation, transmission, substation and communications equipment from such disasters. Specifically, with regard to potential large-scale earthquakes under such areas as the Tokai, Tonankai, and Nankai regions and the Tokyo Metropolitan Area in the near future, the task force is studying their impact on J-POWER facilities and is implementing necessary countermeasures that include reinforcement works for earthquake resistance.

Emergency drills

(Above: Takehara Thermal Power Station, Hiroshima Prefecture; below: J-POWER head office)

References

Compliance

Compliance Promotion Structure

In accordance with its corporate philosophy, J-POWER has instituted its Corporate Conduct Rules, serving as the model for action in the conduct of business that accords with corporate ethics and reflects a law-abiding spirit, and has also instituted its Compliance Code (see p. 75) to provide specific decision-making standards in daily business activities. To ensure that the tenor of the Rules and the Code is constantly effective in practice, the Company has established the Compliance Action Committee, chaired by the chairman, to determine policy for Company-wide compliance activities and to evaluate and modulate how they are being applied, and also the Compliance Promotion Headquarters, headed by the executive vice president responsible for compliance, whose task is to formulate and implement activity plans. Since FY 2009, we have also had an Independent Security Group under the Compliance Promotion Headquarters to provide general oversight of independent security initiatives in departments that build, maintain or operate electrical facilities for business use. In addition, compliance committees have been established in individual branches, thermal power stations and other key units. These organizations and units work through cooperation and liaison to ensure that compliance becomes firmly rooted in our corporate culture.

Compliance Consultation Points

J-POWER has established "Compliance Consultation Points" within our Internal Audit Department and at an outside law office for employees to seek advice when they are facing or have noticed a compliance problem. These consultation centers are careful to protect privacy and ensure that persons seeking advice do not suffer consequences for doing so.

Enhancing Employee Compliance Awareness

J-POWER provides compliance training and lectures as well as inter-occupational exchange programs*1 as needed. In addition, during FY 2009, we designated October as a special month for raising compliance awareness, with events such as contests for compliance slogans.

We also conducted a compliance questionnaire survey in January to learn the state of compliance awareness among J-POWER Group employees and use the results for future compliance activities.

Inter-occupational exchange program

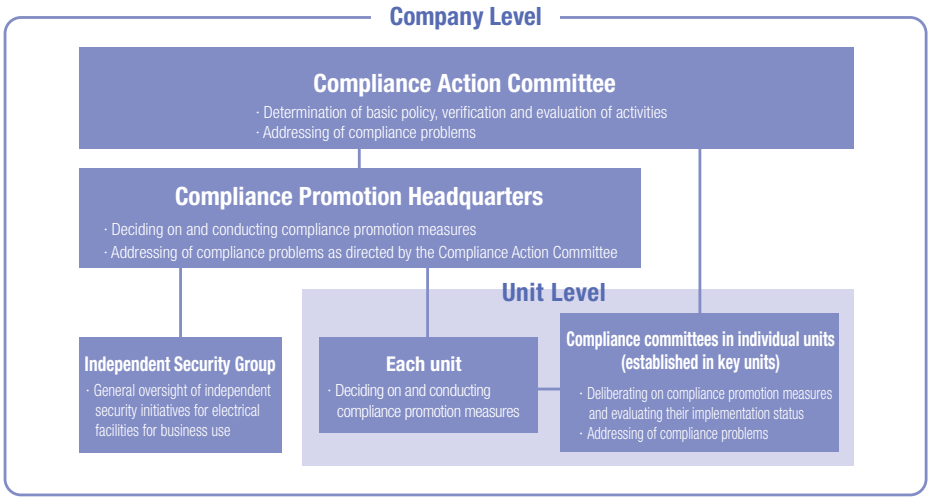
Measures to prevent out-of-compliance issues

J-POWER has had a concrete action program for promoting compliance since FY 2007. This program works to prevent compliance problems. While updating generating station and transformer substation equipment in FY 2009, inadequacies were discovered in the required administrative procedures. The problems were reported to the relevant agencies and corrected without delay.

In any incident like this, we study the facts and investigate the causes, and based upon the results we draft and carry out measures to prevent recurrence. We also make other departments of J-POWER aware of the situation and work to prevent similar incidents from happening there. We also make company personnel aware of any amendment or abolishment of relevant laws when these occur. Furthermore, we regularly monitor implementation of these measures to verify their effectiveness and reflect the results in the action program in the future.

Note: See p. 68 concerning environmental incidents.

● Compliance System Diagram



Compliance is promoted in partnerships between the company-level and unit-level organizations.

*1 Inter-occupational exchange program
Events reaching beyond occupational boundaries; employees in each geographical area meet at a local unit to observe other departments and trade views about compliance.

Information Security Activities

As companies have become increasingly informationoriented and are making ever-greater use of IT, the significance of information security is growing. J-POWER has the duty to build vital national infrastructure in the form of nuclear power stations and to provide stable supplies of electricity. Given this important duty, it seeks to enhance information security and maintain it at a higher level and is implementing a variety of measures to achieve that.

■ Basic Policy on Information Security

J-POWER has formulated its Group-wide "Basic policy on information security", and publicizes it on its website. The information security measures outlined below are implemented throughout the Group in accordance with this basic policy.

In addition to existing operations, the J-POWER Group's business activities are expanding continuously, including the development of nuclear power at Ohma and of power generation business overseas. In tandem with this it is becoming increasingly important to conduct proper information management that earns the trust of society while ensuring the stability of business operations. In view of this, the assurance and enhancement of information security is regarded as an important theme of management, and steps to upgrade the level of security still further are being taken throughout the Group.

http://www.jpower.co.jp/english/privacy/privacy_003_e.html

■ Collaboration in Core Electric Power Systems

J-POWER is also making efforts in the field of IT to help ensure the stability of electric power systems. To position ourselves to deal rapidly and properly with IT problems in core systems for electric power operations, we are strengthening the structure of collaboration with the government and electric power industry as a whole.

Specific Measures

(1) Organization and structure

- Establishment of Information Security Committee as a lateral organization whose membership comprises the heads of all J-POWER head-office divisions
- Designation of the J-POWER IT & Telecommunications Office of the Corporate Planning & Administration Department as the unit in overall charge of information security to promote the development of rules and the implementation of concrete countermeasures
- Quick response by risk management system at any time an information security incident arises
- Joint assessment by all J-POWER Group companies of information security status at individual companies, and implementation of improvements
- Countermeasures involving third-party inspections using external experts

(2) Personal measures

- Instruction and education for all Group employees, including e-learning and seminars

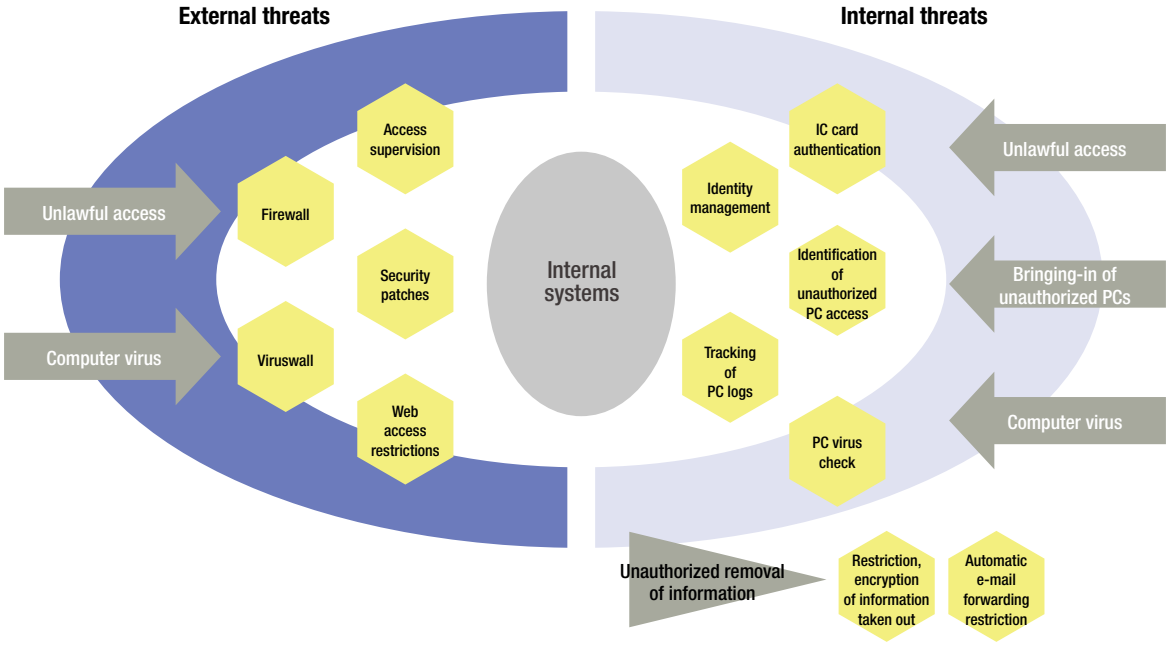
(3) Physical measures

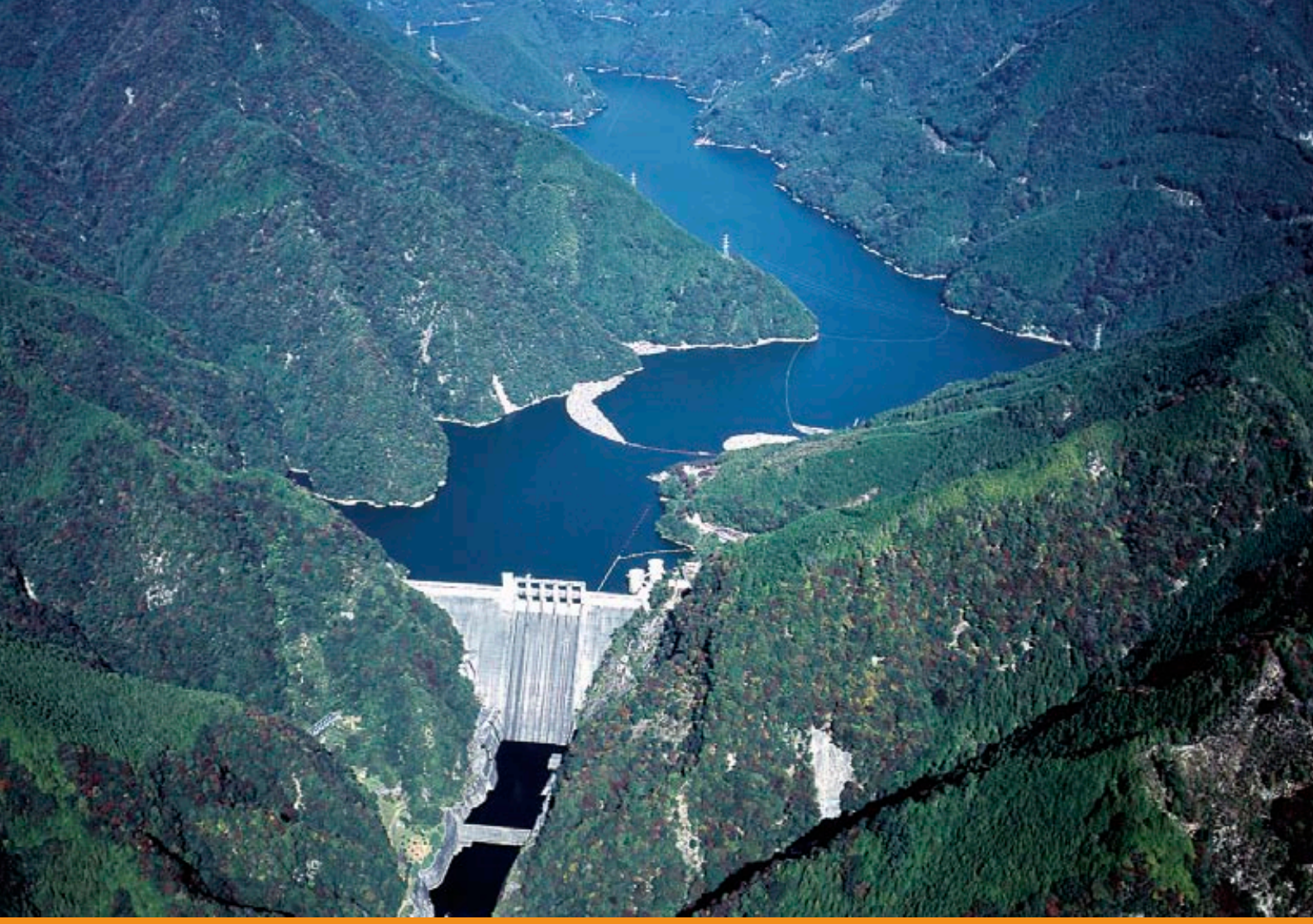
- Locking control (J-POWER head office) when people enter or leave the premises, by means of IC cards (for employee identification)
- Separation of business areas from meeting and reception space

(4) Technical measures

- Prevention of unlawful intrusion through the Internet
- Access management (user authentication) for all business systems by means of IC cards (for employee identification)
- Approval by senior staff for removal of electronic information, and encryption of files
- Encryption of e-mail attached files
- Creating password to PCs for business trip
- Management of collation and analysis of operating logs

● J-POWER Group Information Security Countermeasures





Sakuma Dam (Shizuoka Prefecture)

Social Responsibilities

Social Responsibilities

Part 1

Measures for a Stable Supply of Electricity

The J-POWER Group produces electricity at hydroelectric, coal-fired thermal and wind power stations throughout Japan and transmits it through its power transmission and substation facilities, supporting people in their daily lives. Backed by a highly trustworthy technical capability, it will continue to supply electric power in a stable and efficient manner, bringing peace of mind to people's daily lives.

Toward Nuclear Power Stations that are Safe and Trusted Locally

Japan depends on imports for almost all its energy resources. In order to stabilize the supply of energy into the future, it will be essential to go forward with use of the nuclear fuel cycle. A distinctive strength of nuclear power generation is that it does not emit CO_2 in the course of generating electricity. Assuring safety is the top priority in building the Ohma Nuclear Power Station, a full MOX-ABWR, and construction is proceeding steadily to make this a power plant that the people of local communities have trust in.

Artist's rendering of completed Ohma Nuclear Power Station

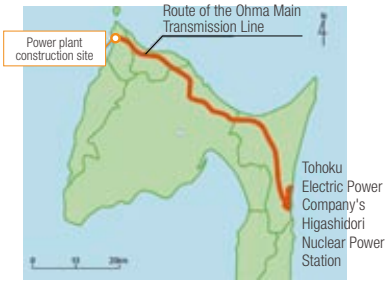


Diagram of Ohma Nuclear Power Station position
(Aomori Prefecture)

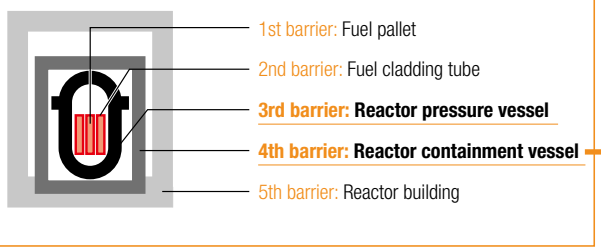
Significance of the Full MOX-ABWR

Most of the uranium that exists in nature is uranium-238, which is not readily fissionable. There is very little of the fissionable uranium-235 to be found. However, even the not readily fissionable uranium-238, when it absorbs some of the neutrons inside a nuclear reactor, will convert into fissile plutonium-239. When this plutonium-239 is reprocessed, removed, and used again in a nuclear power station, the utilization of uranium resources can be made more efficient.

The use of uranium and plutonium mixed oxide (MOX) fuel in nuclear power stations (light water reactors) for the purpose of using plutonium as nuclear reactor fuel is called "pluthermal" in Japan.

Ohma Nuclear Power Station is a full MOX-ABWR that is aimed at loading MOX fuel in all the reactor cores. This follows Japan's conceptual approach to the peaceful use of plutonium by not possessing surplus plutonium. Based on the policy of building broader foundations for the flexibility of the pluthermal program, this method plays an important role by contributing to the conservation and effective use of valuable uranium resources.

● Five barriers encasing radioactive materials



Plan and Background of the Ohma Nuclear Power Station

The J-POWER Group has been carrying out surveys and studies concerning nuclear power development since 1954, and since 1976 it has been pursuing plans to build the Ohma Nuclear Power Station in Ohma-machi, Shimokita-gun, Aomori Prefecture. The Ministry of Economy, Trade and Industry (METI) granted permission to build this nuclear reactor in April 2008. Construction began in May of that year and is currently proceeding with the aim of starting commercial operation in November 2014.

● Overview of the Ohma Nuclear Power Station

Location		Ohma-machi, Shimokita-gun, Aomori Prefecture
Construction begins		May 2008
Commercial operation begins		November 2014 (scheduled)
Output		1,383 MW
Reactor	Type	Advanced Boiling Water Reactor (ABWR)
	Fuel: Type	Enriched uranium and uraniumplutonium mixed oxide
	Fuel assembly	872 elements

The nuclear reactor containment vessel being assembled

References

Status of Construction Work

The site underwent a government bedrock inspection, which is one of the basic foundation tests that checks the strength of the rock foundation, over October 28-29, 2009. This confirmed that the bedrock was entirely safe enough as the foundation for a facility housing a nuclear reactor.

The construction gained momentum after the bedrock inspection, and work on the foundation of the nuclear reactor building began in the spring of 2010. The nuclear reactor building, which houses the nuclear reactor containment vessel[*1], the nuclear reactor pressure vessel[*2], and other key equipment, is a crucial structure in terms of seismic safety, as well, and the steel-reinforced concrete foundation was therefore laid 5.5 m thick.


The bedrock inspection being performed

The mechanical and electrical work of assembling and installing large pieces of equipment is also being performed in order. The use of five barriers is a key element in containing radioactive materials, and the nuclear reactor containment vessel is one of those barriers. On-site assembly of the interior steel plate lining of this vessel is moving forward, and installation will begin in the summer of 2010.

The Status of MOX Fuel Procurement

Procurement of MOX fuel to use in the Ohma Nuclear Power Station is proceeding steadily in parallel with construction of the power plant. A contract for processing MOX fuel was concluded in April 2009, and a contract to take possession of the necessary plutonium was concluded with an electric utility in November.

Quality Assurance Activities

Quality assurance is indispensable to the construction of a safe power plant that can earn the trust of surrounding communities and give them peace of mind. We have established a quality assurance organization headed by the President, and implement quality assurance measures based on the Quality Policy for Nuclear Safety.

Quality Policy for Nuclear Safety

Basic Policy

With sincerity and pride underlying all our corporate activities, and with safety as our first priority, each of us shall be involved in quality assurance activities by making ourselves fully aware of our duties and roles, as well as their importance. In this way we will build the Ohma Nuclear Power Station as a facility worthy of the local community's trust and peace of mind.

Conduct Rules

1. We will perform high-quality design and construction work, giving top priority to assuring safety.
2. We will observe the requirements in laws and regulations, as well as the company's own rules.
3. We will strive for smooth communication with the surrounding communities, the national government, and other related institutions.
4. We will work continuously to improve the effectiveness of quality assurance activities.

Coexistence with Local Communities

We at the Ohma Nuclear Power Construction Office are engaged in a variety of activities directed at residents of the surrounding communities, seeking to gain their understanding of the nuclear power station and trust.

Published monthly, the public information magazine is distributed to every household.

The public information magazine we publish for the residents of local communities has entered its 20th year of covering topics of local interest while providing information on construction status and plans.

We provide educational assistance in cooperation with schools by holding field trips to geological formations and supplemental instruction in science classes. Programs for participation in local festivals and other events of various kinds are also being carried on continuously.


One of the field trips to geological formations being conducted for local elementary and junior high school students

http://www.jpower.co.jp/bs/field/gensiryoku/index.html (Japanese only)

COLUMN

Ohma Main Transmission Line

The electric power generated by the Ohma Nuclear Power Station being built in Ohma-machi, Shimokita-gun, in Aomori Prefecture will be transmitted over the Ohma Main Transmission Line. This 500-kV line extends a distance of 61.2 km over 129 pylons from this power station to the No. 1 Pylon of the Mutsu Main Transmission Line of the Tohoku Electric Power Co., Inc., located on the grounds of the Higashidori Nuclear Power Station in Higashidori Village. Construction of the Ohma Main Transmission Line was completed at the end of January 2010. We have been paying very careful attention to the surrounding environment when building transmission lines (see p. 59, "Northern Japanese Macaque"). We will carry out maintenance of power transmission facilities accurately in the future so as to provide a stable supply of electricity under the harsh climatic conditions of the Shimokita Peninsula.


The Ohma Main Transmission Line (Aomori Prefecture) after construction was completed

*1 Nuclear reactor containment vessel
A structure that contains the nuclear reactor and its cooling system and other such equipment and is important for the safety of the nuclear reactor. Even in the unlikely event of an abnormality such as damage to the nuclear reactor cooling system, this prevents the discharge of radioactive materials to the outside.

*2 Nuclear reactor pressure vessel
A strong vessel made of thick steel to contain the core portion of a nuclear reactor. Inside it are the reactor core with the fuel assembly, the control rods and other core internals, the primary coolant (light water), and so on. During operation, the vessel is under high temperature and high pressure.

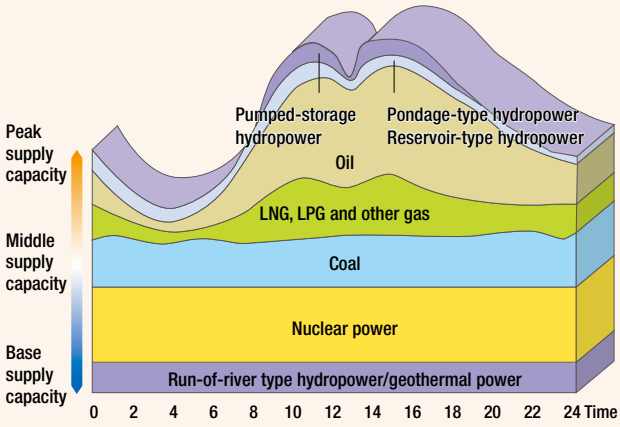
Helping Ensure the Stable Supply of Electricity

The power generating facilities of the J-POWER Group constitute a stable supply capacity, while the company's transmission, substation, and communications equipment bear a portion of the load for the nationwide system of power companies. The company also contributes to the stable supply of electricity as a system of wide area interconnection that connects different regions.

Fulfilling Our Commitment to Stable Supply

Drawing on Different Power Sources to Help Ensure Stable Power Supply

● Combining sources of power to match changing demand



Daily electricity demand varies substantially from daytime to night, and during the course of a year, demand in summer and winter differs greatly from spring and fall. During a single day, factories, offices, and so on use a large amount of electricity in daytime, while the amount used diminishes at night because there is not very much industrial activity. During a year, there is a great difference in power consumption between the summer and winter, when air conditioning and heating see heavy use, and the spring and autumn, when that use is lighter.

There are also differences among nuclear, thermal, hydropower, and other power generating facilities in their economy of use and their operating characteristics. Therefore, J-POWER and other electric power suppliers provide stable power by combining electricity from different sources to create an optimal balance that is matched to demand as it fluctuates day by day and minute by minute.

As Japan's largest wholesale power supplier*1, J-POWER owned and operated domestic power generating facilities with a capacity of approximately 17 GW, as of March 31, 2010. These facilities were mainly hydropower, which is purely domestic energy, and coal-fired thermal, which is economically efficient. The company is thus responsible for approximately 7 percent of Japan's electric power supply. The electric power we generate is delivered to consumers via general electric utilities*2 throughout the country.

Unifying Electric Power in Japan

■ Electric power distribution on a nationwide scale

J-POWER owns and operates approximately 2,400 kilometers of transmission lines and eight substations and converter stations that link Japan's disparate regional power companies together. In this way it plays a major role in the overall operation of Japan's electricity grid. It also operates essential facilities that support power transmission over a wide area in Japan, including extra-high-voltage transmission lines that connect Japan's main island of Honshu with the other main islands of Hokkaido, Shikoku, and Kyushu, and the Sakuma Frequency Converter Station, the first facility in Japan that has made possible the transmission of electricity between the differing frequencies of Eastern Japan (50 Hz) and Western Japan (60 Hz) (see p. 4).

Sakuma Frequency Converter Station (Shizuoka Prefecture)

Additionally, the Central Load Dispatching Center issues appropriate operating instructions (load dispatching) on a 24-hour basis to power stations and other facilities in order to help keep the electricity grid stable while maintaining stable, efficient operations at domestic power facilities owned by J-POWER.

At the same time, stable grid operations are supported by remote monitoring and operations that utilize the latest in information technology. We possess a communications network that includes highly reliable microwave radio circuits, fiber-optic cable, and other such components that we employ to conduct high-precision operation.

Central Load Dispatching Center

References

*1 Wholesale electric power suppliers
These are operators that possess more than 2 GW of power generating facilities and provide electricity to general electric utilities.

*2 General electric utilities
These are operators that provide electricity to meet general demand. The ten regional power companies belong in this category.

Facilities Maintenance and Technology Transmission

The J-POWER Group possesses various facilities in fields such as power generation, power transmission, transformation of electrical energy, telecommunications, civil engineering, and construction. We engage in high-quality facilities maintenance in order to prevent accidents or other incidents before they occur in these facilities and to minimize their environmental load. These maintenance activities maintain the functionality of the facilities, help stabilize the power grid, and contribute to the stable supply of electric power throughout Japan.

Efforts are being made to pass down facilities maintenance skills that have been accumulated through work in these various fields through on-the-job training*1 and training programs conducted at training centers and other locations, with the goal of developing personnel and raising technical skill levels.

On-the-job training in session

Ensuring Stable Facility Operations

In addition to 24-hour monitoring of power generation facilities, the J-POWER Group works to detect equipment abnormalities as early as possible through daily patrols and strives to maintain reliability and prevent accidents and other incidents via such measures as regular overhaul inspections of facilities.

For example, undersea DC cable connecting Hokkaido and Honshu and large-capacity cable linking Honshu and Shikoku, which crosses a bridge connecting the two islands (Seto-Ohashi Bridge), must be managed while taking into account two extreme locations, the bottom of the ocean and the top of a bridge. Recently, J-POWER has worked to make its DC facilities connecting Hokkaido and Honshu more functionally advanced and reliable by upgrading control equipment and other components.

Also, because transmission and substation facilities are located in various environments, from mountainous regions to urban cities, and subjected to harsh natural conditions such as wind, snow, lightning, and sea salt contamination, surroundings must be taken into account when addressing aging facilities and changes in local environments.

Tadami Main Transmission Line (Gunma Prefecture)

Response to Emergency

In addition, J-POWER strives to promptly and accurately respond to emergency situations and has conducted the following measures to prepare for the event of a natural disaster or accident.

1) Establishment of information contact routes with regions where its power generation and substation facilities and transmission lines are located
2) Operation of a mutual assistance structure with all related units
3) Stockpiling of supplies for post-accident recovery
4) Training for dealing with accidents

Improving and Passing Down Technical Skills

The J-POWER Group works to improve and pass down technical skills accumulated in various fields, including facilities maintenance.

In order to maintain stable operations at hydropower and thermal power facilities, the Hydropower Division's Kawagoe Training Center in Saitama Prefecture and the Thermal Power Division's Thermal Power Training Center in Kitakyushu City conduct technical training aimed at maintaining and further developing the practical capabilities of operators and onsite maintenance staff through the use of simulators and other training tools. In the IT & Telecommunications Division, the information technology training facility in Saitama Prefecture is equipped with microwave telecommunications systems and other devices used on actual communications networks. The facility conducts practical technical training to sharpen response capabilities, including training for maintenance workers on how to respond to malfunctions. In the Civil Engineering Division, the Chigasaki Research Institute in Kanagawa Prefecture runs practical training on dam operations using dam simulators located onsite as well as Civil Engineering Technology Training, a comprehensive training program for J-POWER Group employees involved in the field.

Thermal Power Training Center (Kitakyushu City)

Scenes of training with the dam simulator (Chigasaki Research Institute, Kanagawa Prefecture)

*1 On-the-Job Training
Educating and training employees through actual work at the workplace.

Stable Procurement of Coal

Coal Mining Projects in Australia

J-POWER Group is working toward long-term stable procurement of coal to use in coal-fired thermal power stations, and owns stakes in four coal mining projects in Australia for that purpose. The Blair Athol Coal Mine, the key project among those four, will be closing down after 25 years or more since it began exporting coal, while the new Clermont Coal Mine and Narrabri Coal Mine will begin producing in 2010. We are engaging steadily in project management of the development and operational stages of these existing coal mining projects in order to realize stable coal procurement and assure our revenues.

Blair Athol Coal Mine (Australia, open cut mine)

Narrabri Coal Mine under development (Australia, pit mine)

In order to diversify coal procurement sources and secure revenues at the upstream end of the coal business, we are also studying new coal mine investment projects that are relatively cost competitive, paying careful attention to the coal supply-and-demand balance and competitor activity. We will continue taking steps to participate in new coal mining projects with a focus on Australia, where export coal reserves are abundant and the investment environment is well developed.

Stable Transportation of Coal

The J-POWER Group uses many different types of coal, and transporting them to the various power plants requires 200 or more voyages per year. Measures we take for stable transportation include the long-term engagement of specialized vessels to carry purchased coal and the conclusion of contracts of affreightment with the shipping companies.

Voice

Toward the Stable Procurement of Coal

Kouta Yasue
Fuel Group
Energy Business Department

The coal that J-POWER uses as fuel in coal-fired thermal power stations is imported primarily from Australia, Indonesia, and other countries on 200 or more ships per year. When scheduling these shipments, we monitor the schedules of ships that are already at sea and project the amounts and times of coming coal shipments, coordinate shipment times with the coal suppliers, and then request the assignment of vessels by international maritime shipping companies.

When shipments are arranged, there is normally a lead time of one to two months from the start of the process to actual delivery of the coal at the power plant. Even when an extra margin of time is allowed, the actual arrival of coal at the power plant is sometimes significantly delayed by weather at the loading port or production circumstances at the coal mine. Therefore, the stable transportation of coal to every power plant does not simply require coordination with the people in our company who handle coal procurement, transportation, scheduling, and the power plants. Coordination with the people concerned in shipping companies, trading companies, call centers, agencies, and other parties outside the company is also essential. The pursuit of these duties on a day-to-day basis from a variety of perspectives, as required, is what makes it possible to realize the stable transportation of coal 365 days a year (see p. 34).

Coal unloaders at work

References

Contributing to Stable Supply over the Long Term — Topics for FY 2009 —

■ Recognition as Future Technology Heritage (Numappara Power Station)

The pump turbine at Numappara Power Station (Tochigi Prefecture) was recognized for its value to the history of technology as "the world's first high-head high-volume pump turbine to exceed 500 m in pumping capability (528 m)." In October 2009, it was designated "essential historical materials for science and technology" (popularly referred to as a "Future Technology Heritage" and so referred to below) by the National Museum of Nature and Science.

Pump turbine registered as a Future Technology Heritage

This power station was built to help satisfy the rapidly growing peak demand for electricity in the Tokyo metropolitan area. Construction was begun in December 1969, and commercial operation started in June 1973. With a total output of 675 MW, it is a high-capacity pure pumped storage power station*1.

The Miyama Dam upstream on the Naka River forms the lower reservoir, while the Numappara Regulating Pond was constructed up on a prominence on the east side of it as the upper reservoir. The vertical distance between the two is 500 m or more. At the time, the single-stage pump turbine with the highest head drop in the world was capable of pumping water to a height of approximately 400 m. It was even said that 450 m was the technical limit, so that pumped hydropower using the highly economical single-stage pump turbine with a greater head drop than that was considered impossible to achieve.

However, a detailed study based on our engineering capability and experience in the construction of hydroelectric power plants accumulated since the company's founding led to the conclusion that it was possible to achieve. We therefore began joint research with a manufacturer that had abundant experience building pumping machinery. Numerous technical issues were overcome, such as the design of a pump turbine that could realize unprecedented performance and the development of steel for penstock pipe capable of withstanding high pressure. These efforts yielded the first high-head high-volume pump turbine in the world capable of pumping water higher than 500 m.

The engineering success achieved at the Numappara Power Station greatly enhanced the economic efficiency of pumped hydropower, and it also expanded the range of sites capable of development. This power station therefore played an epochal role in the history of pumped hydropower development in Japan.

■ 50 Years Since Commencing Operation (Tagokura Power Station)

Tagokura Power Station (Fukushima Prefecture)

Tagokura Power Station celebrated its 50th anniversary of operation in May 2009. This facility was developed as part of the Okutadami-Tagokura-Miboro (O.T.M.) Project, which was one of the next greatest hydropower development projects after the construction of the Sakuma Power Station. Tagokura is a flagship hydroelectric power plant for J-POWER.

The facilities have reached a stage of growing deterioration due their 50-some years of operation. A comprehensive overhaul of the Tagokura Power Station is therefore underway. (See p. 48.)

We will continue to take action to exist in harmony with local communities, aiming for another 50 years of sustained stability in the supply of power.

Voice

The Mission of Providing a Stable Supply of Electricity

Ikuo Nakamaru
Director, Tagokura Power Administration Office
East Regional Headquarters
Hydropower & Transmission System Department

Celebrating the 50th anniversary of commencement of operations at Tagokura Power Station has renewed my commitment to making this power plant continue contributing a stable supply of electric power for another 50 years, and then 100 years.

As the power plant ages, what supports its operation is steady maintenance work. We are focusing our undivided attention on our daily work with this understanding ever in mind.

Many of J-POWER's hydroelectric power plants are, like the Tagokura Power Station, now approaching their 50th year since starting operation. We consider it the mission of the J-POWER Group to make maximum use of hydropower generation, which is purely domestic energy and which also contributes to curbing global warming.

Everybody in the J-POWER Group joins in the work of improving our hydropower maintenance techniques and steadily engaging in the work of renovation, which no doubt will be increasing in the future. In this way, we will all support the work of providing a stable supply of electricity.

*1 Pure pumped storage power generation
Pumped storage is a method of power generation in which water stored in a lower reservoir is pumped up to an upper reservoir at night, on weekends, or during other time periods when the demand for electricity is low. The stored water in the upper reservoir is then guided and dropped back down to generate power during time periods when the demand for electricity is greater. Pure pumped storage power generation is a particular type in which the upper reservoir receives virtually no inflow from rivers, so that pumping water up from the lower to the upper reservoir is essential in order to generate power.

Developing Technologies for Stable Power Supply

In order to support the stable supply of electricity, the J-POWER Group engages in technology development related to the stable operation and maintenance of electric power facilities, the reduction of the environmental load, and the effective utilization of limited resources.

Ensuring Safe, Secure Power Facility Operations

J-POWER has the Chigasaki Research Institute and the Wakamatsu Research Institute set up under the Technology Development Center. These facilities promote the development of technology to support the stable supply of electricity, working in coordination with the actual sites concerned and with the relevant departments. The Chigasaki Research Institute was founded in 1960 as a civil engineering testing center to support large-scale hydropower development. Its organization was subsequently expanded to keep up with J-POWER business developments, and the institute presently has Civil Engineering Laboratory, Thermal Plant Engineering Laboratory, Material Science Laboratory, Power System Engineering Laboratory, as well as Administration group. This institute engages in various kinds of technology development in addition to the kinds described below, including development of various technologies involved in the construction, operation, and maintenance of hydropower, thermal power, wind power, and transmission facilities. Its other activities include hosting civil engineering workshops, dispatch of instructors to universities, committees, and other such organizations, study tours for members of the public, outreach science classes, and other activities that make advantageous use of institute facilities and personnel resources. The Chigasaki Research Institute will celebrate its 50th year of operation in 2010, and we intend to hold steadfastly to our work of J-POWER technology development intended to achieve the continuing harmony of energy and the environment.

Technology Development Center Chigasaki Research Institute (Kanagawa Prefecture)

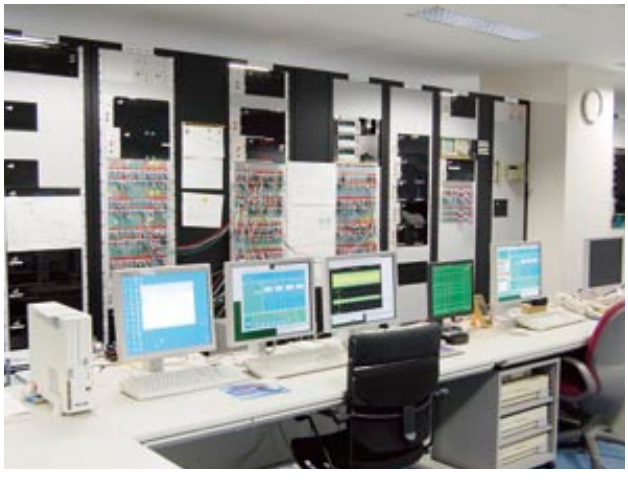
A study tour for members of the public

An outreach science class in session

Increasing the Reliability of Grid Facilities

■ Power Grid Analysis

With the object of maintaining stable operation of electric power facilities as well as the voltage, frequency, and other aspects of power quality, the Chigasaki Research Institute runs Power System Engineering Laboratory where power grid analysis simulators are used to verify and analyze the operation of control systems for electric power sources, direct current substations, and other such facilities. These analyses aid in improving the operational reliability of facility control systems and enable a more precise response in case of lightning strikes and other such events, as well.



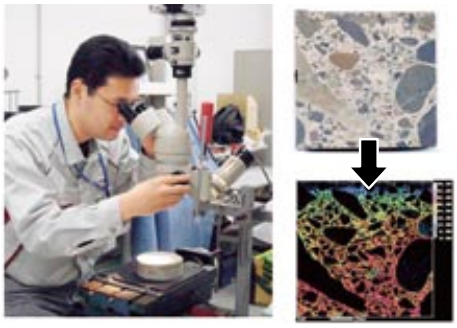
Power grid analysis simulator

References

Maintaining Power Generating Facilities

Technology for Assessing the Health of Concrete Structures

J-POWER's older power generating facilities have passed the age of 50 years or more, and some of the facilities have undergone damage. The questions of when and how much it would be optimal, from a long-term perspective, to spend on maintenance in order to keep providing a stable supply of electricity, must be answered. The Civil Engineering Laboratory at Chigasaki Research Institute has worked on techniques for predicting the deterioration of concrete structures by combining prediction methods proposed at academic conferences with survey data on J-POWER facilities. The result was the proposal of a deterioration prediction technique unique to J-POWER, and it is being used at J-POWER's hydropower generating facilities.



Examining a concrete surface (left)
Determining the extent of concrete deterioration (right)

Supporting Large-Scale Thermal Power Plants

Accurate Determination of the Lifespan of High-Temperature Equipment

The equipment and piping at power plants includes large items that cannot be easily replaced. At thermal power plants, the soundness of heat-resistant steel that is exposed to an environment of high temperatures and high pressures is critical to stable operation. Accurate lifespan assessment is therefore required. Lifespan assessments of heat-resistant steel have been conducted from long ago. However, the mechanisms of deterioration can change as the development of materials progresses, so the goal is to establish accurate assessment technologies that are permanently geared to the type of steel involved. The top world level of power generating efficiency achieved by J-POWER's coal-fired thermal power stations, in particular, is supported by high chrome ferrite heat-resistant steel. The Thermal Plant Engineering Laboratory at the Chigasaki Research Institute is working to establish assessment technology for this type of steel with CO_2 reduction in mind, as well.

Large uniaxial creep tester (maximum load: 200 kN)

Toward the Effective Use of Water Resources

Technology for Increased Efficiency of Mountain Stream Intake Structures

The J-POWER dams used for hydropower generation include large-scale dams such as the Sakuma Dam that are well known. These, however, do not tell the whole story. Our predecessors built small intake structures along mountain streams and channels, and made effective use of the limited water resources. These facilities sometimes become clogged with fallen leaves and branches so that they are unable to take in the designated amount of water. When that happens, somebody goes to that place and clears out the fallen leaves. Almost all the facilities are located deep in the mountains, so that maintenance is difficult. The Civil Engineering Laboratory of the Chigasaki Research Institute built models and conducted experiments with imitation fallen leaves drifting on the current. They have developed techniques for making simple modifications to the facilities so that fallen leaves and branches do not clog the intake and the designated water intake can be achieved without the need for human labor to clear debris away.

Mountain stream intake structure (Miboro No. 2 Power Station, Azukidani intake structure)

Aiming for Diversification of Fuels

Evaluating Fuel Suitability for Thermal Power Plants

The main fuel for J-POWER's thermal power plants is coal. Recent years have brought increasing demand for the high-grade bituminous coal and sub-bituminous coal that have relatively high heating value and low moisture content. Consequently, expectations have turned toward the use of lignite and other low-grade coal. Attention is also turning to expanded use of biomass in order to contribute to reduction of CO_2 emissions.

Since these kinds of low-grade fuel yield low heating value per weight, it is necessary to transport them to the power plants efficiently. There are some fuels that undergo spontaneous combustion more readily, and these must be safely transportable and storable. It is also necessary to maintain good combustibility and environmental properties in the boiler, and to avoid ash deposition, corrosion, and other such problems. These are the purposes we have in mind in seeking to establish technology for assessing fuel suitability.

Electrically heated drop tube furnace (DTF) used to measure fuel combustion properties

Part 2

Enhancing Communication

The J-POWER Group is supported by a wide range of stakeholders. In order to continue earning the trust of stakeholders, we will continue conducting business activities rooted in sincerity and striving to enhance communication.

Harmony between the J-POWER Group and Society

J-POWER Group Approach to Social Contribution Activities

"We build community trust by harmonizing our operations with the environment. Profits are a growth source, and we share the benefits with society." Under this corporate philosophy, the J-POWER Group has long engaged in social contribution activities as a member of society to help society develop soundly and sustainably.

Our activities largely fall into two categories: community involvement and harmonizing energy supply with the environment. We place high value on open communication with local community members and people working to harmonize energy supply with the environment and on sharing knowledge and learning with one another. We will steadily engage in activities on this basis as well as support the volunteer activities of our employees. http://www.jpower.co.jp/company_info/kouken/index.html (Japanese only)

Community Involvement

J-POWER Group's activities are supported by the communities where our power stations and other facilities are located. Every employee is committed to being a good resident in these local communities. In addition, our business sites and offices strive to be good corporate citizens that benefit communities and society as a whole. We will strive to exist harmoniously with local communities and grow together with society through activities that are accepted and trusted by local residents.

J-POWER Community Concerts

"J-POWER Community Concerts" are voluntary social contribution programs that have been held throughout the country since 1992.

"Community Concerts" are held with the cooperation of currently active performers. They bring the performers and audience into close contact to enjoy authentic classical music in a relaxed atmosphere. The programs are centered on the classics, and efforts are made to incorporate old familiar songs, pieces that highlight the characteristics of the musical instruments, songs from anime and other entertainment music that everybody has heard, to appeal to a wide range of ages. J-POWER is pursuing business throughout Japan, and we hold these concerts as an expression of gratitude for the daily understanding and cooperation of community members in areas and other regions where we are operating power plants, etc. They also reflect our commitment to earning further trust and friendship as a member of the local community.

A community concert (Chigasaki Research Institute, Kanagawa Prefecture)

http://www.jpower.co.jp/concert/index.html (Japanese only)

Salvia Road (Hokkaido)

On June 15, 2009, the members of the Togeshita District Council in Nanae-cho together with the teachers and children of Togeshita Elementary School and J-POWER Group employees planted about 30,000 salvia seedlings along a 2-km length of National Highway No. 5 near the Kitahon Power Administration Office.

This is popularly known among local residents as "Salvia Road" and at its peak in the autumn, it becomes a continuous stretch of flaming red salvia flowers.

The salvia flower that colors the national highway was designated the second official flower of Nanae-cho in November 1997.

Planting salvia (Kitahon Power Administration Office and others, Hokkaido Prefecture)

Lake Wakasato Sawayaka Festival (Fukushima Prefecture)

The "Lake Wakasato Sawayaka Festival (organizer: 10 Days for Contact with Forests and Lakes Organizing Committee)" was held on July 25, 2009. This year marks the 21st time for this event, and J-POWER Group again offered the Shimogo Power Plant and its exhibition pavilion as a relay point in the stamp rally.

The power plant was visited by 146 people. They viewed actual hydropower facilities and gained a better understanding of how they work.

Lake Wakasato Sawayaka Festival (Shimogo Power Administration Office, Fukushima Prefecture)

References

Rice Planting at Maruyama Senmaida (Mie Prefecture)

A "Rice Planting Gathering (organizer: Kiwa-cho, Furusato Kosya)" was held at the Maruyama Senmaida paddy fields in Kiwa-cho, Kumano City, Mie Prefecture, on May 17, 2009. Participants included 27 volunteer employees and family members from the Kitayamagawa District, the West Regional Headquarters, and other offices of the J-POWER Group.

Maruyama Senmaida, one of the major locations of terraced rice paddies in Japan, is a scenic area that has been included in the 100 Selected Terraced Rice Paddies of Japan. Local residents started an owner's association in 1996 to maintain these precious terraced rice paddies, and the J-POWER Kitayamagawa Power Administration Office and West Regional Headquarters are among its members.

The weather was unfortunately rainy, but the participants all wore rain capes and joined in planting the rice seedlings.

Maruyama Senmaida (West Regional Headquarters, Mie Prefecture)

Harmonizing Energy Supply with the Environment

In order for people to lead enriching lives, both energy, which supports enriching lives, and a better environment are needed. Leveraging environmental knowledge acquired through our business activities to date, we partner with people seeking to harmonize energy supply with the environment and conduct activities to raise awareness and develop technologies for energy and the environment in an effort to facilitate the sustainable development of Japan and the rest of the world.

J-POWER Experiential Learning Project for Ecology and Energy

The Experiential Learning Project for Ecology and Energy is a social contribution activity that the J-POWER Group is engaging in with the aim of "Harmonizing Energy Supply with the Environment."

People's lives are enriched by energy and the natural environment. In order to achieve a society of sustainable growth that makes effective use of limited energy resources and the bounties of nature, we must cultivate the technology and the state of mind that treats both energy and the natural environment with care as "connections" rather than as antagonistic entities. The company joins with people who are aiming for a sustainable society and cooperates in organizing the "Ecology and Energy Experiential Learning Tour" and the "Ecology and Energy Café."

• Ecology and Energy Experiential Learning Tour

This is an experiential study tour conducted with the cooperation of specialists in environmental education. Participants experience a power plant and nature using all their senses, and enjoy themselves together while learning about the connections between the environment and the energy that supports people's lives.

There are programs geared to ordinary parents and their children in the higher grades of elementary school and to university students.

• Ecology and Energy Café

This is a new forum for learning where topics suggested by guests are used to stimulate relaxed and earnest thinking about ecology and energy as things that are concerned with themselves. Participants learn from each other through dialogue, become aware of the ways that "Ecology and Energy" connect with people's lives, and gain deeper knowledge.

People at the Ecology and Energy Café

http://www.jpower.co.jp/ecoene/index.html (Japanese only)

Initiatives at the Wakamatsu Operations & General Management Office (Fukuoka Prefecture)

An energy and environmental learning program called "An Experience of Rice-Growing" was held for fifth-grade students of the Hanabusa Elementary School, which is located in the same Wakamatsu District as the Wakamatsu Operations & General Management Office. The program was held on the rooftop greening facility of that office on October 9, 2009. Various other programs are also offered by the office to make it easier to learn about energy and environmental issues, including study tours of facilities on the grounds, nature observation tours in the neighboring woods, and "outreach classes" held at schools.

This rooftop greening facility is designed to have excellent functionality as a "locus for environmental education." In 2006, therefore, it received the "Rooftop Greening Prize of the Minister of Environment Award" from the Organization for Landscape and Urban Green Technology Development of Japan.

Rooftop greening (Wakamatsu Operations & General Management Office, Fukuoka Prefecture)

Initiatives at the Miboro Power Administration Office, Chubu Regional Headquarters (Gifu Prefecture)

A COP10*1 Partnership Project ("Message from Miboro: An Ensemble of Water, Nature (Animals, Plants), and Human Beings") was held at Miboro Dam Side Park*2 on August 22, 2009

Professor Osawa of the Faculty of Economics, Aichi University, chaired the event, and Mr. Yamada of the Toyota Shirakawa-Go Eco-Institute, Mr. Hoshino of the Chubu ESD*3-RCE Promotion Network, and the Director of the J-POWER Miboro Power Administration Office were the panelists for a discussion covering the keywords Miboro, Shirakawa-Go, and COP10.

This was followed by an environmental quiz put on by students from Aichi University, live environmentally related performances against the backdrop of Miboro Dam, a grand rock-fill dam, and other events. Many parents with children visiting the Miboro area were invited to attend, and they obtained a deeper understanding of COP10 and environmental issues.

Round-table discussion on the environment (COP10 Partnership Project) (Miboro Power Administration Office, Gifu Prefecture)

*1 COP10
This refers to the "10th Conference of the Parties to the Convention on Biological Diversity" to be held in Nagoya in October 2010. COP is an abbreviation of Conference Of the Parties.

*2 Miboro Dam Side Park
A J-POWER PR facility where a video of the transplantation of the Shokawa cherry trees, famous from the "Cherry Blossom Way," is shown.

*3 ESD
An abbreviation of Education for Sustainable Development.

Asahi J-POWER Kazenoko Juku (Children of the Wind School) (Kumamoto Prefecture)

The "Asahi J-POWER Kazenoko Juku (Children of the Wind School)" was held in Nishihara-mura in Kumamoto Prefecture from September 24 to 25, 2009. Asahi Breweries, Ltd., and J-POWER engaged in a joint venture to operate the "Aso Nishihara Wind Farm," a wind power generating station in Otsu-cho and Nishihara-mura. The cooperation of the Japan Environmental Education Forum, the Communet Association, and other such groups was obtained to conduct this school in connection with the wind farm starting in 2006.

On the 24th, 52 fifth- and sixth-graders from the two elementary schools in Otsu-cho were the participants, and on the 25th, it was 72 fifth-graders from the two elementary schools in Nishihara-mura. The school this time offered kite making and kite flying as a way to experience the wind, followed by opportunities for the children to observe, touch, and enjoy the natural environment and actual wind power generating facilities in Aso while learning.

The Kazenoko Juku (Aso Nishihara Wind Farm, Kumamoto Prefecture)

Initiatives as a Global Citizen

TAKAKURA Compost (Indonesia, Surabaya City)

The J-POWER Group's JPec Wakamatsu Environmental Research Center has been using the TAKAKURA Method*1 to contribute to resolution of the trash problem in developing countries.

The lack of adequate trash treatment facilities and lack of development of collection systems in the countries of Southeast Asia have made garbage a major problem for society. Solving the problem of waste will require measures taken by government authorities and the populace working in unison, from the separation of waste at the point of generation to collection, transportation and treatment. A project covering the city of Surabaya, Indonesia, used the "experience relating to waste administration" possessed by the city of Kitakyushu, the "know-how in international environmental cooperation" possessed by that city as well as by KITA*2 and IGES*3, and the "guidance in compost technology" provided by JPec Co., Ltd., to introduce efficient, sanitary composting of raw waste. Two methods are used, one for compost centers and another for households, and these have taken root as local community technologies.

This compost program contributed to heightened environmental and sanitary awareness on the part of both government administration and the public, and began to develop as an independent activity. As a result, there has been success in reducing the volume of waste and the program has also contributed to environmental improvement throughout the city. The program has also spread to five metropolitan districts in Indonesia, to Sibu City in Malaysia, and to Cebu City in the Philippines.

The compost program in Surabaya City received the "Minister of the Environment Award for Fiscal Year 2006 Programs to Prevent Global Warming" in the "International Contribution Division" and has received a plaque of appreciation from the Surabaya City mayor. The program has been covered by the mass media*4, as well, and has been highly acclaimed as a corporate social contribution activity that resolves a social issue in the developing countries using appropriate technology.

Takakura Home Method Compost (Indonesia, Surabaya City)

Environmentally Considerate Power Plant Construction

The coal-fired Tianshi Power Plant in Shanxi Province, China, is a waste coal-fired thermal power plant established as a joint venture by J-POWER and Chinese partners.

The coal-fired Tianshi Power Plant is sited in a coke*5-producing region. Illegal dumping of coal waste*6 given off by coke production there had caused local environmental conditions to deteriorate, which had become a problem for the region. J-POWER made the decision to participate in this project in part because the power plant would make effective use of low-grade coal and coal waste as fuel.

The power station was established as a comprehensive utilization-type power generation project designed to conserve and effectively use resources in an environmentally considerate manner. The first power station of its kind in China involving foreign capital, the power station has been operating smoothly since it went online in May 2001.

We have been working to provide a stable supply of electricity by the operation of power stations like this, and have sought out ways to make a social contribution in the regions where the power stations are located.

Support for Neighboring Elementary Schools

Like Japan, China has established an official "Children's Day," which falls on June 1 of each year.

There are four towns in the vicinity of the Tianshi Power Plant and they each have elementary schools. To help celebrate Children's Day, every year since fiscal 2005 the Tianshi Power Plant has invited children from one of the local schools to the facility for a tour, Q&A and other activities. The power plant is also donating stationery items to the other elementary schools in the village. The power station's entryway features drawings of the facility made by the children, which is a great source of enjoyment.

References

*1 TAKAKURA Method
A method of resolving waste problems developed using technology and system construction related to composting of raw waste in the city of Surabaya, Indonesia, where it was begun in 2004.

*2 KITA
An acronym for the Kitakyushu International Technocooperative Association.

*3 IGES
An abbreviation for the Institute for Global Environmental Strategies.

*4 Covered by the mass media
"Dawn of Gaia" (TV Tokyo broadcast on December 30, 2008), "The Best House 123" (Fuji Television broadcast on March 3, 2010)

We intend to continue pursuing this kind of positive activity in the future, as well, and will work to make a contribution to neighboring areas.

Local elementary students on a tour of the power station

Implementing Internships

Three companies of the J-POWER Group (J-POWER, JPHYTEC Co., Ltd., and JPec Co., Ltd.) are offering summer internships for science students in graduate school, university, or technical college. The internships provide experience in part of the operations at power plants and other facilities where J-POWER makes its contribution to the stable supply of electricity in Japan. The purpose is to help the interns confirm the results of their learning, stimulate their motivation to learn, and assist them in making future occupation choices. In FY 2009, 54 interns from all areas of Japan took up the challenge of practical training in the maintenance and operation of electric power facilities.

Toward the Steady Facilitation of Social Contribution Activities

We Asked at the Office

Eisuke Minami (left) Youichi Kobayashi (right)
Public Relations Office, Secretarial Affairs & Public Relations Dept.
(Social Contribution Activities Promotion Office)

Q What was the thinking that lay behind the formulation of conceptual approaches for the J-POWER Group's social contribution activities (see p. 29 and p. 30)?

A There was the thought that we want to take past local coexistence program initiatives as the foundation and make the company one that contributes to the sound growth of the local region and community and that actively continues the programs implemented to date.

Q Looking back at the activities of 2009, how does it look?

A We covered activities in every location and placed articles in the Group information magazine "J-POWERs" and in the information magazine "GLOBAL EDGE" for general audiences in such a way that the value of activities could be increased by the collection and dissemination of information. (See p. 39.) We intend to make the dissemination of information about social contribution activities implemented by the J-POWER Group a priority topic in which we will engage again in 2010.

Q What kinds of ingenious measures are being used to share information in the Group?

A We set up an in-house blog in the Group called "CO-COB*7" in order to share information regarding social contribution activities. In the blog, we carry a wide range of information, from the activities of the various agencies down to individual volunteers, and are sharing it. On J-POWER Day*8, which comes once a year, we hold a "social contribution activity case study presentation session" for lectures on the topic of corporate social contribution activities and presentations on the activities of the various agencies, and we conduct meetings on the volunteer experience, and other such events. For the future, we would like the meaning of activities to be shared by everyone from management down to young new employees by means of communication with a recognizable human face.

Q It seems that the Public Relations Office has also become the consultation desk for social contribution activities.

A We provide support mainly on information aspects of the activities in which the various agencies are engaged. During FY 2009, we received five inquiries, and we provided cautions regarding tree planting programs, provided information on volunteer activities, and so on.

Q How were activities in the voluntary programs going?

A I'm glad to say that we managed to hold the customary "Community (Mini) Concerts" (five concerts) and the "Ecology and Energy Experiential Learning Tour" (five tours) as before, without incident. In 2009, we also held the new event called "Ecology and Energy Café" (three times). Our many participants enjoyed themselves, and that was also energizing for us. In 2010, we are slated to augment these offerings with an added event, an Ecology and Energy Experiential Learning Tour to be held at the Miboro Power Plant in Shirakawa-Go.

*5 Coke
A greyish-black, porous solid formed when coal is dried by distillation at high temperatures to remove the volatile portions.

*6 Coal waste
The debris and poor-quality coal remaining at coal mines after the coal has been selected out.

*7 CO-COB
This is the acronym for the Community Contribution Blog.

*8 J-POWER Day
October 6, the day when J-POWER shares were listed in the market, is treated as a second anniversary of the founding, when the J-POWER Group made a new start.

Promoting Business Activities

The J-POWER Group works to earn the trust of shareholders, investors, and business partners by promoting its business activities, which are rooted in sincerity. We are also working to deepen trust by facilitating understanding of our activities and seeking views and opinions on them through enhanced communication.

Communicating with Shareholders and Investors

The J-POWER Group conducts timely disclosure of corporate information as well as a range of activities to deepen understanding of our business operations, reflecting the importance we place on communicating with shareholders and investors.

Communicating with Institutional Investors

For institutional investors, we hold briefings on management plans and financial results, actively hold meetings as the need arises, and work to provide opportunities for direct dialogue with management and other company members. In addition, we provide a range of investor relations tools, including an annual report and fact book, and make information available on our website in order to convey messages from management and other detailed information.

http://www.jpower.co.jp/english/ir/index.html

Communicating with Individual Investors

For individual investors, we hold corporate presentations, publish a corporate newsletter aimed at individual investors, provide information via our website and make efforts to enhance disclosure. A section called "Communicating with Individual Investors" has been added on the J-POWER website, and we are improving the environment to allow easy access to the information that individual investors want.

Briefing for individual investors

Communicating with Individual Shareholders

For individual shareholders, we issue a biannual shareholder newsletter ("Kabunushi Tsushin") to further shareholder understanding of our business activities. We also conduct regular questionnaire surveys and constantly work to improve our communication based on the responses we receive. Starting in October 2009, we have been offering a new information service called the "J-POWER Club" that sends pamphlets and other such material and distributes e-mail newsletters on a membership basis.

Toward Further Improved Communication

We intend to continue enhancing communication with shareholders and investors.

IR Tools

We provide information to shareholders and investors using our website and a variety of other investor relations tools.

Annual Report/Shareholder Newsletter/Fact Book/
Notice of "J-POWER Club" opening for applications

Tour of Power Station

We conduct tours of power stations around the country several times a year to help institutional investors and shareholders become more familiar with the J-POWER Group and deepen their understanding.

Tour of Power Station (Koriyama-Nunobiki Kogen Wind Farm/Fukushima Prefecture)

References

Committed to Business Partners

The business activities of the J-POWER Group are supported by a large number of business partners.
Rooted in good relations with business partners, we will contribute to the sustainable development of Japan and the rest of the world.

Coal Carrier Operations

The coal used as fuel by J-POWER's coal-fired thermal power stations is imported from Australia and other coal-producing countries. That coal is transported using bulk carriers*1 operated by Nippon Yusen K.K. and other Japanese shipping companies. Since the coal-exporting countries and Japan are separated by several thousands of nautical miles, the time that coal spends en route to the power plant is affected by circumstances at the port where the coal is loaded and shipped, oceanographic conditions in the navigation sea area, and weather conditions, so that the scheduled date of arrival at the J-POWER plant changes constantly. Factors in assuring the stable operation of J-POWER's power plants include, of course, the stable operation of ships carried on by the shipping companies, as well as day-to-day contact and coordination between the J-POWER representatives who arrange shipping schedules and shipping company dispatchers. This communication is extremely important. (see p. 25)

Bulk coal carrier "SOUTHERN CROSS"

Voice

Commitment to Stable Transportation of Coal

Tatsuya Shimomura
Steaming Coal Team Manager
Steaming Coal Group
Nippon Yusen K.K.

We are proud to serve J-POWER, which is engaged in the day-to-day work of providing a stable supply of electricity in Japan, by shipping the coal that is crucial to their endeavors.

Our company, for its part, will fulfill this weighty responsibility by continuing our efforts to provide safe and stable transportation services into the future. We will do this by making effective use of close communications, a shipping system capable of finely tailored support of the customers' needs, ships of superior quality in terms of hardware as well as in terms of expertise and experience, and our land-based support system.

Project for Domestic CO_2 Emissions Reduction by Fuel-Switching

The United Linen Supply Co., Ltd., is a group company under Hakuyosha, the largest of the cleaning companies, and it provides hotel linen supplies and uniforms to domestic luxury hotels, hotel chains belonging to private railway companies, major family restaurants, and other such customers. Energy conservation and environmental issues have become major topics for the linen supply industry, and the Tokyo plant (Ota-ku, Tokyo) carried out a fuel-switching project in December 2009, using technology provided by J-POWER to change over from oil-fired boilers to gas-fired boilers.

This project is expected to have an annual CO_2 reduction effect equivalent to about 250 t. In January 2010, therefore, the project acquired Ministry of Economy, Trade and Industry certification as a CO_2 emissions reduction project based on the domestic credit system (see p. 55). The certified domestic credits are all to be transferred to J-POWER.

Interior of a United Linen Supply Co., Ltd., plant

Voice

Projected 250-t CO_2 Reduction Effect

Yoshimitsu Nakamura
President & Chief Executive Officer
United Linen Supply Co., Ltd.

Our company declares a corporate philosophy of "offering people services that provide untiring technological innovation and inspired emotion to create living spaces that are clean and comfortable, and so to contribute to society." We therefore engage actively with environmental and sanitary issues. The CO_2 reduction project in our Tokyo plant represents our company's first domestic credit project. As J-POWER's business partner in this, we intend to contribute to the reduction of emissions by J-POWER and also to engage actively with energy conservation and environmental problems in the future.

*1 Bulk carrier
A ship that loads coal or other such cargo into its hold and carries it not in sacks or cartons but in loose form.

Developing Human Resources and Creating a Dynamic Workplace

The J-POWER Group strives to ensure safe, comfortable working environments while endeavoring to create a corporate culture that respects the character and individuality of employees and inspires them to constantly meet new challenges with a high level of motivation.

J-POWER Group's Basic Philosophy on Human Resources

Building a Human Resources Foundation for Sustainable Group Growth

Human resources are the key to a company's sustainability. For the sustainable growth of business, all employees must cultivate their skills and abilities in order to continually create added value with new ideas.

Under our new medium-term management plan that started in fiscal 2008, we have placed the highest priority on securing and developing human resources in order to strengthen the foundation of the company for the purpose of ensuring sustainable growth. We intend to reinforce the foundation for career development, centering on CDP*1 programs, establish working environments and systems that harness diversity in values and in the workforce, which includes experienced employees and women, and improve both individual skills and workforce productivity by promoting work-life balance.

Developing Group Human Resources and Creating Dynamic Workplaces

Securing Human Resources

In order to grow continuously while harmonizing energy supply with the environment, the J-POWER Group aims at stably recruiting new employees from various fields and age groups and creating opportunities that enable them to thrive.

With regard to personnel hiring and utilization, J-POWER's Compliance Code (see p. 75) has provisions stipulating respect for individuality and human rights and prohibiting discrimination. Awareness-raising on these matters is conducted in level-specific training and in human rights training conducted by each unit.

We are currently creating systems and working environments that enable our diverse personnel to fully demonstrate their capabilities, without regard for gender, age or other such distinctions.

● Employment of New Graduates (J-POWER)

	FY 2008	FY 2009	FY 2010
Men	40	60	75
Women	8	5	5
Total	48	65	80

■ Promoting the Employment of the Elderly

Under our system of continuing employment for workers who have reached retirement age, starting in FY 2010 we are expanding the period of employment to age 65 so that the elderly can engage in still greater activity. In combination with the personnel registration system, which introduces job opportunities in the Group, we will harness the experience, technology, and motivation to work possessed by older people in the Group and make use of it for the sustained growth of our business. As of March 31, 2010, 262 employees had taken advantage of the continuing employment system and related programs.

■ Employing People with Disabilities

Our employment ratio for people with disabilities was 1.87 percent as of June 1, 2010, thereby exceeding the legal requirement. A "consultation desk to provide employment assistance and information on working environments to employees with disabilities" has been established, and we will continue to enhance working environments through such initiatives as making office buildings barrier-free and promoting greater understanding among all employees.

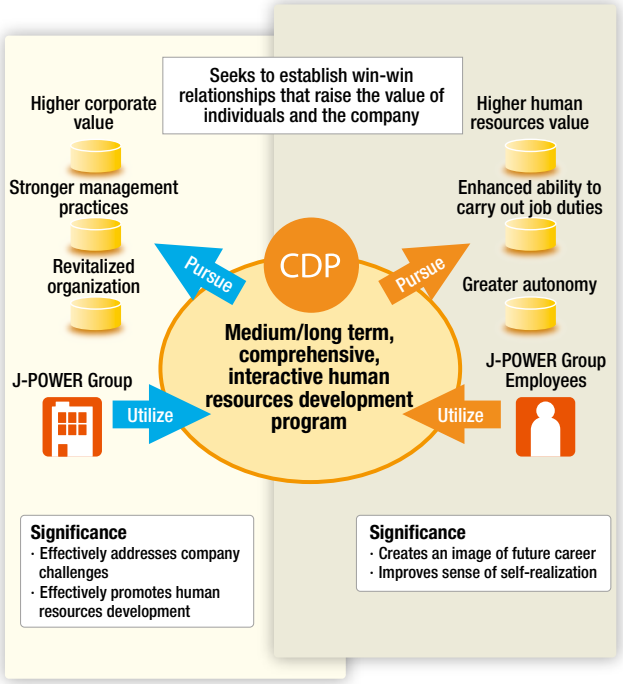
References

*1 CDP: Career Development Program
CDP refers to programs for developing human resources and specific skills through career development.
CDP programs seek to effectively promote human resources development by combining skill development based on knowledge and experience accumulated in performing daily work activities (on-the-job training) and skill development based on training (including self-study) that takes place away from daily activities (off-the-job training).

Human Resources Development

The J-POWER Group aims to develop all of its employees into independent, highly talented personnel (professional human resources) who refine a multiplicity of specialized skills and knowledge so as to contribute to achievement of organizational objectives from a broad perspective. We have adopted CDP as an education and training program that is effective for that purpose. The program provides management with specific guidelines for fostering personnel. It provides employees with an interactive development tool that helps them think about their own career trajectories and take the initiative in developing their abilities and raising their value to the company. We encourage employees to make active use of the program.

● CDP Overview



Human Resources Development Programs

The J-POWER Group believes in the importance of using work itself, particularly on-the-job training (see p. 24), to enable employees to improve their job performance and facilitate their growth. At the same time, as the scope of our business activities has expanded, we have established programs to systematically train personnel through a well-designed plan so that their abilities are fully utilized.

Evaluation and Assessment System

The J-POWER Group established an evaluation system in 2004 that is rooted in goal management. Through initiatives aimed at achievement of specific goals, the system encourages employees to perform work autonomously, motivates them to achieve the goals and improves work performance. We also seek to realize our organizational strategies through unit- and goal-based collaborative action.

Various Training Programs

We run level-specific training courses designed to provide employees with business knowledge and management skills that match their qualifications and age. Career training is also provided for employees to review their careers to date and consider their next steps. We also conduct divisional training, objective-specific training, and other off-JT*1 courses to enhance employee knowledge, skills, and specialization in order to meet divisional requirements and ensure we are capable of quickly accommodating changes in business conditions.

We have established technical training facilities in Chigasaki, Kanagawa Prefecture for civil and architectural engineering divisions; Kawagoe, Saitama Prefecture for hydropower, transmission, and telecommunications divisions; and Kitakyushu, Fukuoka Prefecture for thermal power divisions. We systematically conduct training for engineers in technical divisions at these facilities. Level-specific training is held at the Human Resources Development Center in Tokyo's Chuo Ward. These initiatives are aimed at fostering personnel in line with our career development programs.

● Participation in Level-Specific Training and Career Training (J-POWER)

	FY 2007	FY 2008	FY 2009
New assistant managers	65	64	74
New managers	120	129	106
Career plan training	55	80	68
CLDS*	91	82	108
Total	331	355	356

* CLDS: Career & Life Design Seminar
A training course on life design and financial planning to help employees develop post-retirement career and life plans.

Training for new Thermal Power Division employees

Combined business leader training

Helping Employees Voluntarily Develop Their Careers and Abilities

J-POWER introduced a self-assessment system for employees to convey their career intentions to the company once a year and discuss them with their immediate superiors. The system was introduced to facilitate career-related discussions between employees and management. We also have a voluntary training incentive program and an academic training program that provide financial assistance to employees who attend foreign language classes or business school or take a correspondence course after work or on weekends. These programs are aimed at helping employees develop their abilities on their own initiative.

● Participation in the Voluntary Training Incentive Program (J-POWER)

	FY 2007	FY 2008	FY 2009
School attendance	74	76	66
Correspondence	101	78	75

*1 Off-JT
This is the abbreviation for Off-the-Job Training. It is a method of developing capabilities by having employees engage in study away from the workplace so they will acquire knowledge and skills.

Improving the Environment to Achieve Invigoration

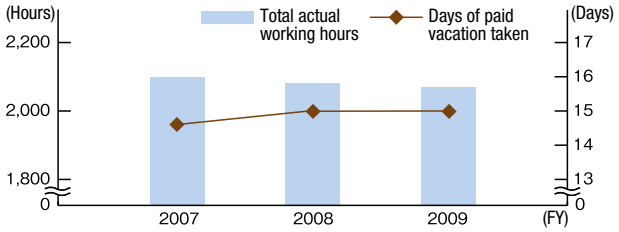
Toward Realization of a Work-Life Balance

The J-POWER Group believes that a better work-life balance can help ensure labor productivity and lead to improved efficiency. We are actively developing working environments and cultures that enable every employee to autonomously enhance their work and personal life and focus on highly creative work.

Creating Time

Appropriate working hours has been established as a common goal for all units in order to properly manage hours and improve employee productivity. The company is promoting strengthening of the practice of making employees leave the workplace by a fixed time at business sites and offices, and inviting outside instructors to give lectures on work-life balance. Other activities we are promoting include introducing case studies of initiatives and holding workshops.

● Change in Total Actual Working Hours and Paid Vacation Taken



Moral Harassment Consultation Desk

A consultation desk has been established for employees to discuss working hours and the working environment as well as sexual harassment, power harassment, and other issues. We have also developed in-house regulations, manuals, and other such resources, and we have implemented education for increased awareness in level-specific training courses as measures to resolve problems as well as to prevent them. Our goal is a working environment where human rights and individuality are respected and where diverse personnel are completely at ease in going about their work.

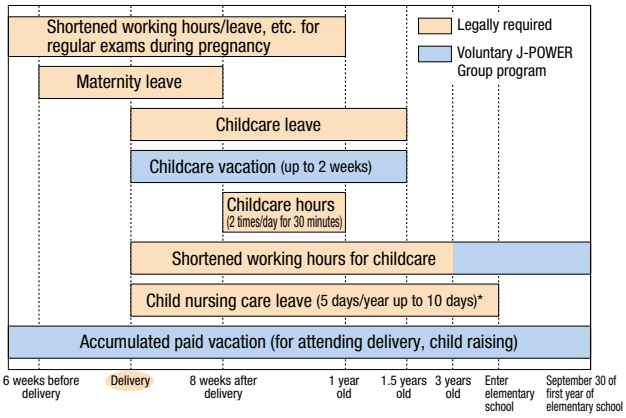
Programs to help employees work in diverse ways

J-POWER has established multiple options in its working and leave programs in order to enable employees facing differing life circumstances to fully demonstrate their abilities. We are making particular efforts to improve the system for supporting a healthy work-life balance by granting leave, shorter working hours, or other such measures for employees who are involved in child-rearing or caring for elderly family members. We are also developing a framework to support employee engagement in a wide range of activities by a leave system and other measures to allow voluntary participation in local exchange activities, volunteer programs, and the like.

● System Utilization

	FY 2007	FY 2008	FY 2009
Childcare leave	20	19	13
Childcare vacation	19	26	27
Shortened working hours for childcare	10	19	21

● Overview of Childcare Programs



* Child nursing care vacation: Up to 5 days/year/child can be taken, with an annual limit of 10 days for two or more children (revised in 2010)

Caring for Elderly Family Members

Legally required (93 days)	Elderly family member care leave: 365 days/person	(including the legally required 93 days)
	Shortened working hours for elderly family member care: 2 years/person	(including the legally required 93 days)
	Elderly family member care vacation: 5 days/person/year with an upper limit of 10 days/year*	

* Elderly family member care vacation: Up to 5 days/year for one family member can be taken, with an upper limit of 10 days/year for two or more family members (newly instituted in 2010)

Voice

We are Using the Volunteer Vacation System

Takao Araki
Facility & Environment Management Group,
Wakamatsu Operations & General Management Office

At the Wakamatsu Operations & General Management Office and the Wakamatsu Research Institute, volunteers have been registering with the Wakamatsu-ku Volunteer Center in Kitakyushu City and continuing with programs there since 2006. Their activities mainly involve using the welfare-purpose vans owned by volunteer groups to drive local (Wakamatsu-ku) elderly people to and from hospitals, shopping, and the like.

Encouraged by colleagues here who had actual experience as volunteers, I decided I would like to try helping out, if I could. The volunteer vacation system was also in place, so I started on activities. When I see the elderly people smile, or hear them say, “Thank you,” I feel a sense of relief to think that I have been able to help even a little bit.

I am interested in activities to raise awareness among our employees, and would like to expand the circle of volunteers here.

References

Enhancing Working Environments

J-POWER Group "always seeks to heighten safety consciousness in expediting work, and gives highest priority to assuring the safety of the public and of the workers." In addition, we aim for "creation of a safe, healthful workplace that provides job satisfaction as the foundation for business activities." We operate occupational safety and health management systems within the Group and promote overall safety management, thus working to prevent workplace accidents and maintain or improve employee health.

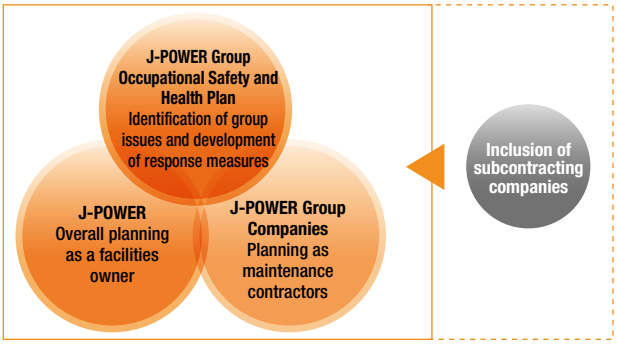
Planning Based on Mutual Cooperation

At the J-POWER Group, common issues pertaining to the Group as a whole and approaches to addressing them are compiled into a "J-POWER Group plan for occupational safety and health." Based on this overall plan, each Group company formulates its own plan for occupational safety and health that takes into account its own positions and responsibilities, and each company promotes J-POWER Group activities for occupational safety and health.

In drawing up the Group plan, J-POWER comprehensively checks to ensure that safety management is being conducted appropriately from the perspective of a facilities owner and outsourcer. At the same time, J-POWER's group companies formulate their plans based on the perspective of an organization with direct responsibility for maintenance work or other operations.

The majority of accidents in recent fiscal years have been workplace accidents involving contractors connected with construction and other work. In order to prevent occupational accidents, it is essential that our activities are unified and collaboration takes place with partner companies on the front lines. To this end, we work toward more vigorous communication between the workplaces and the people concerned, to include subcontractors, so that they will be permeated by safety consciousness. We also implement safety promotion councils, safety patrols, safety training, traffic safety workshops, and other safety activities, and with the cooperation of the parties involved, we are engaged in continuous efforts to prevent recurring workplace accidents and traffic accidents.

● Operational Safety and Health Planning through Mutual Collaboration



J-POWER Group Safety and Health Initiatives

The J-POWER Group has established the following priorities as common themes in safety and health activities.

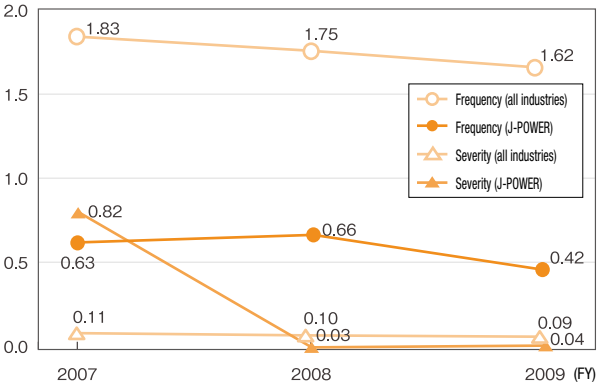
1. Safety Priorities
   1) Enhance communication
   2) Prevent recurring workplace accidents
   3) Prevent traffic accidents resulting in injury or death and other commuting-related accidents
2. Health Issues
   1) Promote mental and physical health

● Incidence of workplace accidents*

	FY 2007	FY 2008	FY 2009
Deaths	2	0	1
Serious Injury	5	8	6
Minor Injury	8	9	5

* Incidence of workplace accidents: Accidents involving J-POWER employees and accidents involving contractors (principal contractors and subcontractors) doing construction and other work ordered by J-POWER

● Accident Frequency* and Severity*



* Frequency: Accident frequency index (Number of deaths or injuries caused by occupational accidents per one million working hours)
* Severity: Accident severity index (Number of days of work lost per 1,000 working hours)

Maintaining the Health of Employees and Their Families

The J-POWER Group conducts initiatives designed to help employees and their families maintain or improve their health. We encourage employees and their families to undergo health checkups, provide guidance in the area of health maintenance, and promote prevention of communicable diseases. We also place emphasis on measures to prevent mental health disorders and metabolic syndrome that can lead to lifestyle diseases, which have both become major social issues. Since fiscal 2008, we have conducted special institutionalized exams and health-related guidance as well as THP activities*1 to promote physical and mental health.

THP activities put priority on physical health, mental health, and communication with Group employees and others. Every workplace provides guidance on health, nutrition, and exercise, fitness measurement, mental health care in the form of lectures and experiential counseling, and other related activities.

We also hold activities and events to promote communication and development of good exercise habits, including walking events.


THP yoga class

*1 THP Activities
Activities aimed at total health, both physical and mental, based on Ministry of Health, Labour and Welfare guidelines on Total Health Promotion Plans.

Communicating with Employees

The J-POWER Group communicates through an intranet in order to reliably convey management information to each and every employee. It also issues a monthly periodical for the Group, called *J-POWERs*, that provides detailed information to employees, for example, by explaining particularly important information in straightforward feature articles.

Exchange that transcends differences in age and job category is carried out by means of cultural and athletic activities as well as THP activities (see p. 38). This serves to further heighten the sense of unity in the J-POWER Group.

In the area of industrial relations, adequate communication occurs and cooperative relationships are being built up on those measures that require labor and management to work together, such as the development of stable working conditions and matters of work-life balance.

Voice

Representing Employees

Yasushi Oono
The J-POWER Group Worker's UNION Chairman

Our union was initially established as the J-POWER Group Worker's Union (JPGU) in 1956 and has worked over the years to improve wages and other working conditions. It took on the role of representing group employees in 2004 in order to represent labor in this age of group management.

Specifically, we strive to be a democratic organization that represents the collective will of our members, and we seek to maintain or improve employment stability and working conditions through negotiations with the Group Labor Committee.

In addition, through administrative meetings, labor related discussions and other avenues, we fulfill a monitoring function that helps maintain the soundness of J-POWER Group management, and thereby contribute to the Group's development. In terms of day-to-day activities, we have a number of consultation desks*1 to support union members in need of help and resolve everyday problems. The consultation desks are managed with appropriate cooperation from the corporate organization.

Communication Tools

The J-POWER Group publicizes its environmental activities and other initiatives and communicates a range of information through its public relations activities. We convey information on harmonizing energy and the environment in an easy-to-understand manner through pamphlets, informational videos, television commercials, newspaper advertisements and other channels.

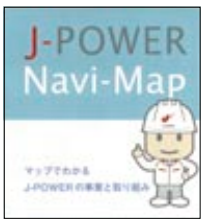
● J-POWER Website

We strive to maintain two-way communications with all stakeholders. The "Contact Us" page of our website provides an email address and phone number.

● Corporate Brochure

Provides an overview of J -POWER' s overall business activities

● J-POWER Navi-Map



J-POWER businesses and initiatives are presented on a map so they can be understood at a glance.

● J-POWER Card

J-POWER initiatives and related matters are introduced in a form suitable for children.

● Global Edge

This informational magazine introduces the Group's technologies and business activities. It features contributed articles and interviews on the topic of harmonizing energy and the environment.

● Sekitan Power

Provides information on the importance of coal and coalfired power stations as well as the J-POWER Group's initiatives to address global environmental problems

References

*1 Consultation Desks
Consultation is offered on general issues, including legal issues, labor matters, sexual and moral harassment, financial planning, and compliance.

Aso-Nishihara Wind Farm (Kumamoto Prefecture)

Environment

Environmental Management in the J-POWER Group

The J-POWER Group believes that energy production and the environment can coexist in harmony. In light of this corporate philosophy, our environmental management aims to promote greater environmental responsibility while enhancing the economic value of our operations in order to further contribute to the development of a sustainable society.

J-POWER Group Environmental Management Vision

In keeping with the Basic Policy of the J-POWER Group Environmental Management Vision, which was formulated in 2004, the J-POWER Group has adopted an Environmental Action Program laying out specific tasks and goals and the means to achieve them. The Group as a whole is working to achieve these environmental goals, guided by Corporate Targets* that outline midterm targets for our efforts and Environmental Action Guidelines that clarify the focus of our efforts for each fiscal year.

* In addition to Group-wide corporate targets, business divisions and affiliates set their own targets tailored to their operations.

Environmental Management Vision

Basic Policy		Item	Target	Base-year performance, etc
Basic Stance	As an energy supplier, we will contribute to the sustainable development of Japan and the rest of the world by harmonizing our operations with the environment and ensuring the constant supply of energy essential to human life and economic activity.			
Part 2 Efforts Relating to Global Environmental Issues	In accordance with the principles of the United Nations Framework Convention on Climate Change, we will costeffectively address issues relating to climate change on a global scale. We will continue to reduce CO_2 emissions per unit of electric power sold through an economically rational combination of measures including maintenance and improvement of the efficiency of energy use; development of low CO_2 emission power sources; development, transfer, and dissemination of new technologies; and utilization of the Kyoto Mechanisms. Furthermore, we will continue to work toward our ultimate goal of achieving zero emissions through the capture and storage of CO_2.	· Reduce CO_2 emissions per unit of electric power sold (domestic and overseas operations) (*1)	Approx. 10% reduction from FY 2002 level (in FY 2010)	FY 2002 0.72 (kg-CO_2/kWh)
		· Maintain/improve thermal efficiency of thermal power stations (HHV [higher heating value])	Maintain current level (about 40%) (FY 2008 and each FY thereafter)	—
		· Reduce SF_6 emissions; increase recovery rate during inspection and retirement of equipment	Inspection: at least 97% Retirement: at least 99% (FY 2008 and each FY thereafter)	—
		· Reduce electric power consumption at offices	At least 4% reduction from FY 2006 (in FY 2010) At least 1% annual reduction	FY 2006 22.82 (GWh)
		· Reduce fuel consumption by offices (gasoline equivalent)	At least 4% reduction from FY 2006 (in FY 2010) At least 1% annual reduction	FY 2006 1,644 (kl)
Part 3 Efforts Relating to Local Environmental Issues	We will take measures to reduce the environmental impact of our operations by saving, recycling, and reusing resources to limit the generation of waste and foster good community relations.	· Reduce SOx emissions per unit of electric power generated(point of generation, thermal power stations)	Maintain current level (about 0.2 g/kWh) (FY 2008 and each FY thereafter)	—
		· Reduce NOx emissions per unit of electric power generated (point of generation, thermal power stations)	Maintain current level (about 0.5 g/kWh) (FY 2008 and each FY thereafter)	—
		· Increase recycling rate for industrial waste	97% (by the end of FY 2010)	—
		· Increase paper recycling rate	At least 85% (by the end of FY 2010) At least 1% annual increase	FY 2006 87%
		· Increase rate of green purchasing of office supplies (stationery, etc.)	At least 80% (by the end of FY 2010)	—
		· Increase percentage of recycled copy paper purchased	At least 99% (by the end of FY 2010) At least 1% annual increase	FY 2006 95%
		· Increase percentage of low-emission vehicles	At least 90% (by the end of FY 2010)	—
Part 4 Ensuring Transparency and Reliability	We will ensure that our business activities comply with all laws and regulations, disclose a wide range of environmental information, and enhance communication with stakeholders.	· Raise level of environmental management	Continuous improvement of EMSs (FY 2008 and each FY thereafter)	—

Efforts to protect biological diversity are introduced on page 59.

*1: "Reduce CO_2 emissions per unit of electric power sold" concerns both domestic and overseas operations. (see p. 45)

50th anniversary of the replanting of the Shokawa Zakura (2010 marks 50 years since the replanting of two old cherry trees that would have been flooded by the construction of the Miboro Dam in Gifu Prefecture)

Action Program

Corporate Targets

	FY 2008 performance	FY 2009 performance	FY 2009 evaluation and next steps	Further Information	Fiscal Year Guidelines
	0.69 (kg-CO_2/kWh)	0.66 (kg-CO_2/kWh)	The volume of power sold decreased by approximately 2% against the previous fiscal year owing mainly to a decrease in the operating rate of thermal power stations, and CO_2 emissions were reduced by about 5%, reducing emissions intensity to 0.66 kg-CO_2/kWh, roughly 8% below the FY 2002 level. We will continue to strive to meet our 2010 target.	p. 45	Environmental Action Guidelines, p. 76 (Reference Data)
	40.1 (Reference: LHV = 41.1) (*2)	40.3 (Reference: LHV = 41.4)	The J-POWER Group maintained a total thermal efficiency of 40.3% (HHV) for thermal power generation in FY 2009 thanks to efforts to maintain highly efficient operation in existing thermal power stations and adopt high-efficiency technologies when upgrading facilities. We will continue working to maintain and improve efficiency of energy use in our thermal power stations.	p. 48	
	Inspection: 99% Retirement: 99%	Inspection: 99% Retirement: 99%	The FY 2009 target was met, with a recovery rate of 99.2% during inspections and 99.1% at retirement, thanks to efforts to curb emissions during equipment inspection through careful and consistent recovery and reuse. We will continue to stress careful and consistent recovery and reuse to curb atmospheric emissions of SF_6 from gas insulation equipment.	p. 57	
	21.86 (GWh) 2% annual decrease	21.07 (GWh) 4% annual decrease	Thanks to energy-saving efforts including turning lights off during lunch break, reducing power supply to equipment on standby, and adjusting air conditioner settings, the FY 2009 target was met with a reduction of 4% against the previous fiscal year, representing a reduction of 8% against 2006 figures. We will continue our energy conservation efforts with the help of office energy-saving checklists and other tools.	p. 58	
	1,310 (kl) 2% annual decrease	1,348 (kl) 3% annual increase	Office fuel use increased by 3% against FY 2008, but this represented a decrease of 18% against FY 2006 figures, and our target was therefore met. We will continue working to reduce fuel consumption by making maximum use of public transportation, making more efficient use of company vehicles, using green driving techniques, etc.	p. 58	
	0.20 (g/kWh)	0.16 (g/kWh)	Thanks to fuel control and correct operation of flue gas desulfurization systems, we were able to curb SOx emissions to maintain the level of emissions per unit of power generated. We will continue our efforts to curb emissions through good management practices.	p. 62	
	0.50 (g/kWh)	0.44 (g/kWh)	Thanks to fuel control and proper operation of flue gas desulfurization systems, we were able to curb NOx emissions to maintain the current level of emissions per unit of power generated. We will continue our efforts to curb emissions through good management practices.	p. 62	
	98%	98%	The target for the end of the FY 2010 was exceeded thanks to steps to promote recycling of coal ash and reduce industrial waste generated by maintenance and operation of power stations. We will continue working to maintain our high recycling rate.	p. 63	
	91% 5% annual increase	85% 6% annual decrease	Our rate of recycling paper declined by 6% against FY 2008, but we achieved the targets set for the end of FY 2010. We will continue to promote recycling to reduce disposal of non-industrial waste.	p. 64	
	73%	77%	Thanks to efforts to promote green purchasing in accordance with the J-POWER Group Green Purchasing Guidelines, the rate rose by 4% from the previous fiscal year. We will intensify our efforts and continue working toward the FY 2010 target.	p. 64	
	98% 3% annual increase	99% 1% annual increase	The FY 2009 target was met thanks to efforts to maximize use of recycled copy paper. We will continue to promote such efforts to further boost the percentage of recycled paper used.	p. 64	
	91%	93%	Thanks to efforts to promote green purchasing in accordance with the J-POWER Group Green Purchasing Guidelines, the rate rose by 2% from the previous fiscal year, exceeding the target for the end of the FY 2010. We will continue such efforts so as to maintain this level and meet our target.	p. 64	
	Consistent use of PDCA cycle	Consistent use of PDCA cycle	Efforts were made to raise the level of environmental management through consistent implementation of the PDCA cycle. We will remain diligent in striving for continual improvement.	p. 67	

*2: LHV (lower heating value) estimated from actual HHV (higher heating value) using conversion coefficients supplied in the Agency of Natural Resources and Energy's Comprehensive Energy Statistics (FY 2004 edition).

Business Activities and the Environment (Fiscal 2009)

The charts below detail the resource consumption and environmental load of J-POWER Group operations within Japan.

Note: Figures represent the aggregate of all J-POWER Group companies (J-POWER and consolidated subsidiaries); in the case of joint investments, figures are prorated according to the ratio of capital contribution.

INPUT

Thermal Power Generation

● Fuel

Coal (wet)	18.33 million tons
Heavy oil	42,000 kl
Light oil	51,000 kl
Natural gas	71 million Nm^3
Biomass	3,000 tons
● Industrial-use water	7.71 million m^3

Notes:
1. Apart from waste water, almost all industrial-use water used in thermal power stations is released into the atmosphere as steam.
2. River water used in hydroelectric stations is not included in the input figures, as all such water is returned to the river after power generation.
3. While steam is used in geothermal power stations, hot water is returned underground after power generation via an injection well.

● Major Chemicals Consumed (undiluted equivalents)

Limestone ($CaCO_3$)	138,000 tons
Ammonia (NH_3)	13,000 tons

Hydropower Generation

● Power for pumped storage	800 GWh

Geothermal Power Generation

● Steam	1.05 million tons
● Hot water	4.99 million tons

Internal Use at Business Sites and Offices

● Electricity (purchased)

Business sites	56.78 GWh
Offices	17.11 GWh

● Fuel (gasoline equivalent)

Business sites	14,118 kl
Offices	1,348 kl

● Drinking water

Business sites	160,000 m^3
Offices	450,000 m^3
● Copy paper (A4 equivalent)	57 million sheets

Business Activities

Electric Power Generated

Thermal
50,600 GWh

Hydroelectric
10,000 GWh

Geothermal/Wind
500 GWh

Auxiliary power for operation and transmission loss 3,600 GWh

Volume of electric power sold 57,000 GWh

Pumped storage hydroelectric power output 600 GWh

Total **57,500** GWh

Supply

Note: Due to rounding, figures may not add up to totals.

The electricity generated at our power stations is supplied through regional power companies to end users throughout Japan. The 57,000 GWh of wholesale electric power we sold last year is equivalent to approximately 7 percent of total electric power sold by regional power companies.*

* Total electric power sold in FY 2009 was 858,500 GWh, according to confirmed figures on electricity demand published by the Federation of Electric Power Companies of Japan.

Major Resources Recycled

Coal ash	1.66 million tons (99.4%)	Other industrial waste	24,000 tons (72.5%)
Sludge (excluding gypsum)	8,000 tons (28.8%)	Waste paper	406 tons (85.4%)
Gypsum (desulfurization byproduct)	260,000 tons (100%)	Driftwood from dam reservoirs	14,000 m^3 (97.8%)
Sulfuric acid (desulfurization byproduct)	27,000 tons (100%)	Percentages indicate recycling rate.	

Effective Utilization (cement plants, etc.)

OUTPUT

Thermal Power Stations

● Emissions into the Atmosphere

CO_2	40.88 million t-CO_2
SOx	8,000 tons
NOx	22,000 tons
Soot and dust	1,000 tons

● Emissions into Bodies of Water

Waste water	3.34 million m^3
Waste water COD	12 tons

Geothermal Power Station

● Hot water	5.26 million tons

CO_2 Emissions from Business-Site and Office Activities

● Business sites	46,000 t-CO_2
● Offices	10,000 t-CO_2

Waste

● Industrial waste

Coal ash	9,000 tons
Other	29,000 tons

● Specially controlled industrial waste

Specially controlled industrial waste	100 tons

● Non-industrial waste

Waste paper	69 tons
Driftwood from dam reservoirs	600 m^3

Environmental Accounting and Eco-Efficiency

The J-POWER Group regards environmental accounting as an important tool for environmental management. Through ongoing disclosure of environmental accounting data, we aim to further enhance the reliability and adequacy of information on cost and effectiveness. Improving eco-efficiency (production per environmental load) is one of the goals outlined as part of our basic stance in the Basic Policy section of the J-POWER Group Environmental Management Vision.

Note: Additional data provided on p. 81, Reference Data.

Environmental Accounting

To calculate the costs and benefits of the J-POWER Group's environmental conservation activities in fiscal 2009 in keeping with the nature of our business, we referred to the Environmental Accounting Guidelines 2005 issued by the Ministry of the Environment.

Environmental Conservation Cost and Benefit

Total costs for fiscal 2009 were approximately 47.2 billion yen, with pollution control costs for preventing contamination of the air, water, etc., accounting for about 50 percent of the total.

When looking at environmental load, the nature of our business requires that, instead of tabulating total emissions, we assess the overall environmental conservation benefit of our conservation measures on the basis of emissions intensity, thermal efficiency, and reuse/recycling rate, comparing these levels with the fiscal 2005 benchmarks.

Economic Benefit

Efforts contributing to earnings and cost reductions were calculated to have had an economic benefit of approximately 8.4 billion yen.

● Economic Benefits (Unit: billion yen)

Category	Details	Benefit
Revenue	Sales of marketable commodities from coal ash, gypsum, and sulfuric acid	0.4
Cost reduction	Reduction in fuel costs due to improved coal-fired thermal efficiency (introduction of USC)	2.7
	Reduction in disposal costs due to coal ash, gypsum, and sulfuric acid recycling	5.3
Total		8.4

● Conservation Costs and Benefits

Category	Major measures and efforts	Cost (billion yen)	Environmental conservation benefit	FY 2005	FY 2009
Pollution control	Air pollution control (desulfurization/denitrification, soot and dust treatment), water pollution control (waste-water treatment), etc.	23.4	SOx emissions intensity (g/kWh)	0.20	0.16
			NOx emissions intensity (g/kWh)	0.50	0.44
			Soot and dust emissions intensity (g/kWh)	0.02	0.01
Global environmental conservation	Measures to reduce greenhouse gas emissions (maintaining high-efficiency operation of thermal power stations, developing renewable and untapped energy sources, maintaining energy-saving equipment, curbing of greenhouse gas emissions other than CO_2)	2.0	CO_2 emissions intensity (kg-CO_2/kWh)	0.68	0.66
			Average coal-fired thermal efficiency (%)	40.5	40.3
Resource recycling	Waste reduction through reuse and recycling, treatment and disposal of waste	12.5	Coal ash recycling rate (%)	99.4	99.4
			Industrial waste recycling rate (%)	98	98
			Gypsum recycling rate (%)	100	100
			Volume of driftwood recycled (1,000 m^3)	12	13
Other	Research and development, social activities, etc.	9.8			
Total		47.2			

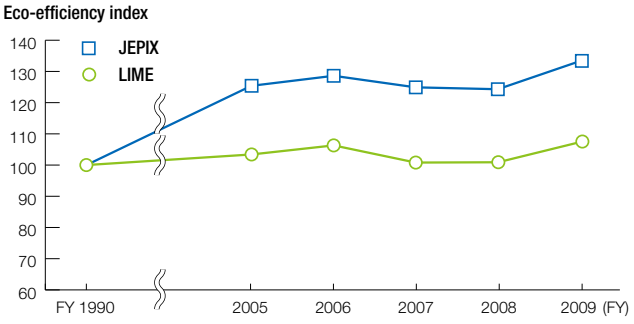
Note: For detailed data regarding each category, see p. 77–78, Fiscal Year Data, in the Reference Data section.

Eco-Efficiency

In the J-POWER Group, we have used JEPIX*1 and LIME*2 to evaluate the efficiency of our efforts to this point. Although the two methods assign different coefficients to various aspects of the environment, both indicate an overall trend of improving eco-efficiency since fiscal 1990.

As our medium- to long-term tasks henceforth, we are working to reduce the environmental load by improving the efficiency of energy use, which is closely tied to increased eco-efficiency, and developing renewable energy sources.

● Integrated Index of Eco-Efficiency (electric power sold per environmental load)



Note: Eco-efficiency: 100 = FY 1990 integrated index (electric power sold per environmental load).

References

*1 JEPIX (Environmental Priorities Index for Japan)
An index that calculates a single score for overall environmental impact using the Ecopoints system, which assigns weights to more than 300 environmental pollutants according to their impact on water and air quality.

*2 LIME (Life-cycle Impact assessment Method based on Endpoint modeling)
An integrated environmental impact assessment method that assigns weights to potentially harmful substances by scientifically analyzing their contribution to such environmental problems as global warming and destruction of the ozone layer and calculating their damage to human health, ecosystems, etc.

Part 2

Efforts Relating to Global Environmental Issues

Global warming is one of the most serious long-term problems humanity will have to grapple with in the present century. As the United Nations continues discussions towards a new international framework to succeed the Kyoto Protocol, Japan is examining the introduction of a variety of systems and measures towards the realization of a low-carbon society. Focusing on the concept of the coexistence of energy and the environment, the J-POWER Group regards measures to combat global warming as a top management priority and is pursuing these initiatives vigorously.

The J-POWER Group's Four Strategies for the Problem of Global Warming

The J-POWER Group in Japan is the source of approximately 3 percent of this country's total CO_2 emissions. This is something we take very seriously. As a leader in the use of coal, we recognize our social responsibility to deal with global warming, making it one of the top priority issues for our corporate management. The four strategies outlined below are helping to shape our short-range, mid-range, and long-range efforts to continue reducing CO_2 emissions intensity.

1 Maintenance and Improvement of Energy Use Efficiency

In addition to promoting increased efficiency in thermal power generation, we are further boosting the power generation efficiency of hydropower facilities, which do not emit CO_2, by continually upgrading them. (p.47–)

2 Development of Low CO_2 Emission Power Sources

The J-POWER Group is working to develop power generation that emits little or no CO_2, including nuclear power, wind power, and solar energy. We are also actively working to take effective advantage of biomass as an energy source. (p.49–)

3 Development, Transfer, and Dissemination of New Technologies

The J-POWER Group is developing coal gasification technology to improve power generation efficiency as well as technology for capturing CO_2. We also intend to continue our quest for next-generation technologies and lead the world in coal-fired power generation, while transferring and promoting the spread of our ultra super critical technology. (p.53–)

4 Utilization of the Kyoto Mechanisms and Other Measures

J-POWER is making use of its technological and financial resources to apply such Kyoto Mechanisms as the Clean Development Mechanism (CDM), which allows member countries to count the amount of emissions reduced by projects they conduct in other countries for cutting greenhouse gases as their own reductions. In this way we are contributing to effective reduction of CO_2 emissions on a global scale. (p.55–)

We are advancing the fight against global warming by effectively combining the four strategies in an appropriate way, from a long-term standpoint.

- Implementing the Ohma Nuclear Power project (See p.21)
- Making older thermal power stations more efficient (See p.47)
- Enhancing hydropower facilities and operation (See p.48, 49)
- Promoting the development of wind power and other forms of renewable energy (See p.50)
- Effective use of biomass fuel (See p.51)
- Technological innovation achieving dramatic gains in power generation efficiency from coal (See p.53)
- Establishment of CO_2 capture and storage technology (See p.54)
- Utilizing Kyoto credits and domestic credits (See p.55)

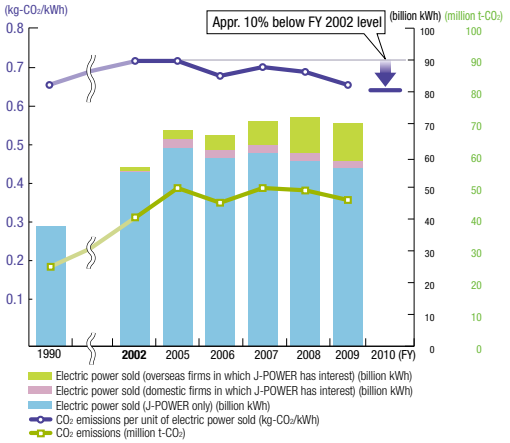
CO_2 Emissions in Fiscal 2009

In fiscal 2009, electric power sold by the J-POWER Group as a whole, calculated by pro-rating sales according to J-POWER's ownership share in each consolidated affiliate in Japan (21 companies) and overseas (21 companies), was 70,000 GWh, representing an annual decrease of about 2 percent. During the same time CO_2 emissions decreased approximately 5 percent, to 46.52 million t-CO_2.

CO_2 emissions per unit of electric power sold fell 4 percent, to 0.66 kg/t-CO_2/kWh, the result of a increase in electricity sold from hydropower facilities and a drop in electricity sold from thermal power stations, reflecting a decline operating rate. This figure is 8 percent below the baseline fiscal 2002 level of 0.72 kg-CO_2/kWh. We will continue working to reach our target through such strategies as the development of low-CO_2-emission power sources* and utilization of the Kyoto Mechanisms.

* CO_2 emissions reduction benefit of wind power and other alternative energy sources (estimated using average CO_2 intensity of all energy sources in Japan): Electricity sold from wind power and geothermal generation in FY 2009 was approximately 400 GWh and 90 GWh respectively, yielding a combined emissions reduction benefit of approximately 180,000 t-CO_2. (For hydropower, see p. 49.) The annual emissions reduction benefit from Ohma Nuclear Power Station since its completion is estimated at around 3.2 million t-CO_2 (based on an 80 percent utilization rate).

● J-POWER Group (Japan and Overseas) CO_2 Emissions



Scope of data included in calculation of CO_2 emissions and electric power sold

In order to ensure compatibility with our financial reporting, from FY 2009 we are no longer including all companies in which J-POWER has an investment in our calculation of CO_2 emissions per unit of power sold (emission intensity), but will confine our focus to consolidated affiliates. In addition to our own figures, for the consolidated affiliates and equity method affiliates among the energy-producing companies in which J-POWER has an investment domestically and overseas, we will aggregate the amount of power sold and the CO_2 emissions for their respective fiscal years in proportion to our investment ratio, and calculate basic units on this basis.

We have also modified aggregates for past figures, but the reduction in the scope of the companies included in the aggregate has resulted in a reduction of less than 1% in these figures.

COLUMN

Coal Use and Measures to Counter Global Warming

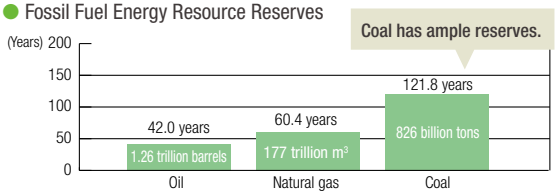
The J-POWER Group is one of the biggest coal users in Japan, consuming approximately 20 million tons of coal per year at eight coal-fired power stations. With a total capacity of 8.55 GW, these stations account for approximately 20 percent of Japan's total coal-fired generating capacity.

We are endeavoring seriously as a leading company in the industry to balance the effective use of coal with responsiveness to global environmental issues.

The Significance of Effective Coal Use in Today's World

The world today depends on fossil fuels for most of its energy needs. Among these fuels, coal has more abundant reserves than oil or natural gas. Moreover, it is available globally including Asia rather than being concentrated in the Middle East, and is therefore used throughout the world as a main energy source. Coal-fired power generation accounts for around 40 percent of the world's current electricity production, and coal is expected to continue to be a major source of energy, helping to meet ever-rising global energy demands in China, India and elsewhere.

● Fossil Fuel Energy Resource Reserves

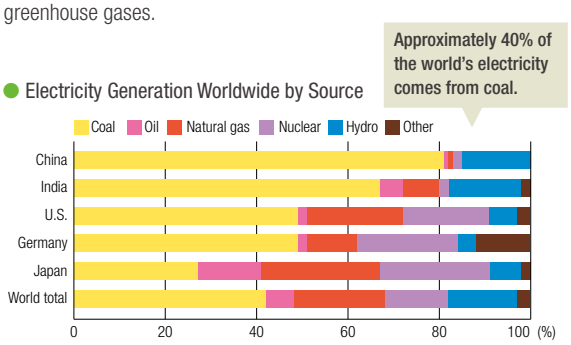


Source: Compiled by J-POWER using data from BP *Statistical Review of World Energy Information 2009*

For Japan, dependent on overseas sources for the majority of its energy resources, coal will continue to be essential in keeping a robust and flexible energy mix.

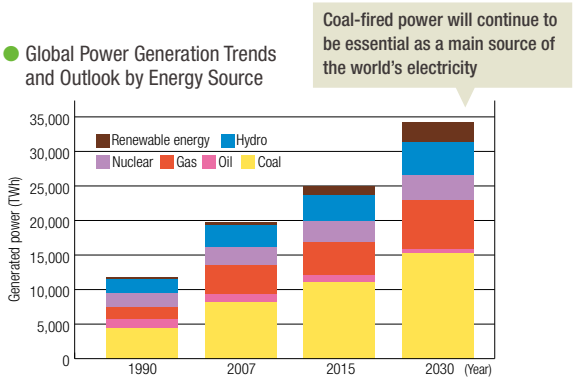
At the same time, when coal and other fossil fuels are burned they generate CO_2, a greenhouse gas. In the midst of growing energy demand, the world faces the issue of how to reduce emissions of CO_2 and other greenhouse gases.

● Electricity Generation Worldwide by Source



Source: Compiled by J-POWER using data from IEA *World Energy Outlook 2009* except the data for Germany which is from IEA *Electricity Information 2009*

● Global Power Generation Trends and Outlook by Energy Source



Source: Compiled by J-POWER using data from IEA *World Energy Outlook 2009*

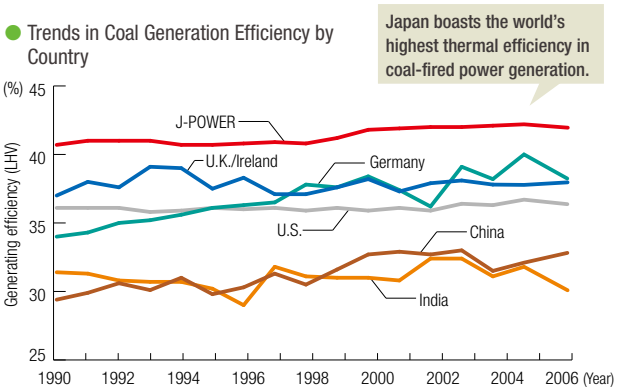
The Significance of Improving Coal-Fired Power Generation Efficiency

Increasing the efficiency of power generation is an effective means of reducing CO_2 emissions from thermal power stations. In Japan, however, coal-fired power stations generate electricity with higher energy efficiency than in Europe or Asian countries by raising the temperature and pressure in steam turbines to ultra super critical (USC) conditions.

If this high-performance technology were introduced in the United States, China, and India, it is estimated that CO_2 emissions in these three countries could be reduced by around 1.3 billion tons annually, an amount equivalent to Japan's annual total of CO_2 emissions and five percent of the world total. It is therefore important to transfer and disseminate these efficient technologies.

In addition, the J-POWER Group is pioneering efforts to develop next-generation coal-utilization technologies aiming at higher energy efficiency, including integrated coal gasification combined cycle (IGCC) and integrated coal gasification fuel cell combined cycle (IGFC) systems.

● Trends in Coal Generation Efficiency by Country



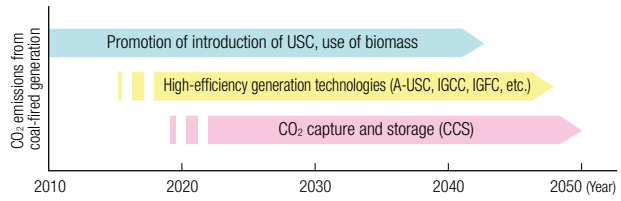
Source: Compiled by J-POWER using data from Ecofys *International Comparison of Fossil Power Efficiency and CO_2 Intensity 2009* (provided by FEPC)

Ultimate Goal: Zero CO_2 Emissions

Projects are under way around the world to develop carbon dioxide capture and storage (CCS) technology, and it is thought that CCS will have a major role to play in fighting global warming in the future.

The J-POWER Group is also conducting R&D towards increasing the efficiency of IGCC + CO_2 separation and capture system (see p. 53) and is participating in the Callide Oxyfuel Combustion Project, which is attempting to verify the viability of a system of CO_2 capture and underground storage using oxyfuel technology (see p. 54).

● Towards zero CO_2 emissions



Maintenance and Improvement of Energy-Use Efficiency

The energy-use efficiency of the J-POWER Group's coal-fired power facilities is among the highest in the world, thanks to our ongoing efforts to develop and actively incorporate our own cutting-edge technology. At our hydropower stations, as at other facilities, we strive for stable operations and work to further improve equipment efficiency during upgrades. In addition, the entire Group is working as a team to improve energy conservation.

Topics Start-Up of Isogo Thermal Power Station New No. 2 Unit

Isogo Thermal Power Station, Pinnacle of Pulverized Coal Technology

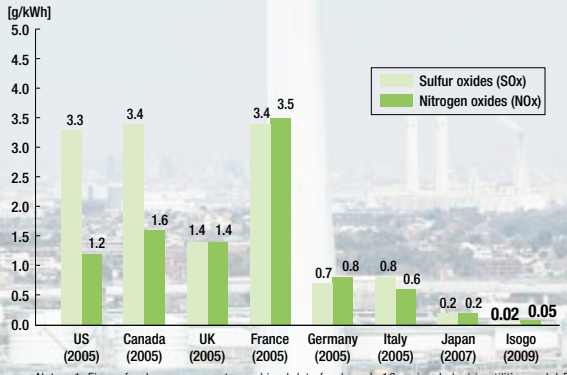
The Isogo Thermal Power Station new No. 2 unit (capacity: 600 MW), under construction since October 2005, began operating commercially in July 2009. With the new No. 1 unit up and running as well, this marks the completion of a massive project to replace the whole generating equipment at Isogo Thermal Power Station. Determined to make Isogo Thermal Power Station a showcase of advanced clean-coal technology, J-POWER boosted the power station's thermal efficiency by applying some of the world's most advanced ultra super critical (USC) technology (main steam at 25 MPa and 600ºC). In the new No. 2 unit, moreover, the reheated steam temperature was raised another 10ºC to 620ºC, to boost heat efficiency even higher and further reduce CO_2 emissions.

Thanks to the installation of cutting-edge anti-pollution equipment, SOx and NOx emissions per unit of electricity generated (intensity) at Isogo Thermal Power Station are extremely low at levels one digit smaller than those of major industrial countries. In this way the Isogo Thermal Power Station has emerged as one of world's most advanced facilities in terms of curbing emissions that impact the environment.

● Overview of Isogo Thermal Power Station

Item	Old No. 1 and 2 Units	New No. 1 and 2 Units
Output	No. 1 Unit 265 MW No. 2 Unit 265 MW Total 530 MW	No. 1 Unit 600 MW No. 2 Unit 600 MW Total 1,200 MW
Fuel	Coal (domestic)	Coal (overseas)
Coal storage	Outdoor storage	Indoor storage (silo)
Boiler	Natural circulation drum-type boiler	Tower-type once-through boiler
Flue gas denitrification system	———	Dry-type flue gas denitrification system (selective catalytic reduction of nitrogen oxide with ammonia) Denitrification efficiency: No.1 Unit 87.5% No.2 Unit 91.9%
Dust precipitator	Electrostatic precipitator Wet-type flue gas desulfurization system Dust-collecting efficiency: 99.75%	Electrostatic precipitator Dry-type flue gas desulfurization system Dust-collecting efficiency: No. 1 Unit 99.94% No. 2 Unit 99.97%
Flue gas desulfurization system	Wet-type flue gas desulfurization system (lime gypsum process) Desulfurization efficiency: 89%	Dry-type flue gas desulfurization system (activated coke adsorption process) Desulfurization efficiency: No. 1 Unit 95.0% No. 2 Unit 97.8%
Smokestacks	No. 1 Unit 120 m No. 2 Unit 140 m	200 m (two-stack centralized type)
Coal ash use	Coal ash utilization rate 90% or more (Amount generated: 170,000 tons/year)	Coal ash utilization rate 90% or more (Amount generated: 380,000 tons/year)
Proportion of greenification to total area	15%	20%
Port facilities	Coal unloading wharf-Oil unloading pier × 1	Coal unloading wharf × 1 Coal ash loading-Oil unloading pier × 1

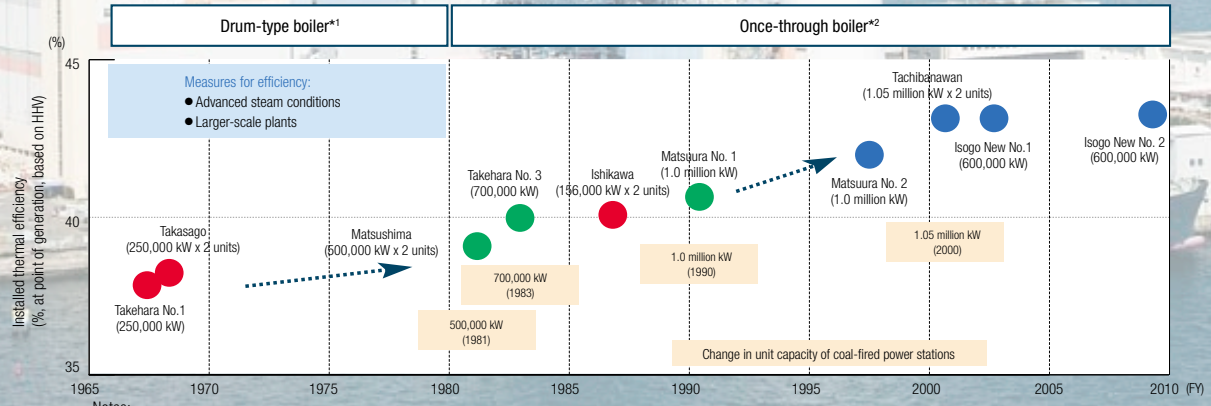
● SOx and NOx Emissions Intensity of Thermal Power Generation by Country



Notes: 1. Figure for Japan represents combined data for Japan's 10 regional electric utilities and J-POWER.
2. Country figures represent combined emissions intensity for coal-, oil-, and gas-fired thermal power.

● Thermal Efficiency of Coal-Fired Power Generation by J-POWER

Strict environmental regulation and quest for economic efficiency ⇒ Steady improvement in thermal efficiency of J-POWER's coal-fired power generation



Notes:
● Sub-critical: Steam pressure less than 22.1 MPa
● Super critical: Steam pressure at least 22.1 MPa and steam temperatures up to 566ºC
● Ultra super critical: Steam pressure at least 22.1 MPa and steam temperatures exceeding 566ºC

*1 Drum-type boiler
These boilers have steam drums in which steam and water are separated, and the steam is released.

*2 Once-through boiler
These boilers do not use steam drums, but produce steam in the flow inside steam pipes.

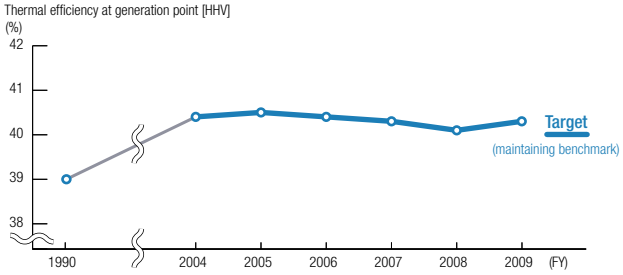
Toward Improving Efficiency of Thermal Power Stations

When the thermal efficiency of a thermal power station declines, it means that more fossil fuel is consumed to produce the same amount of power, resulting in an increase in CO_2 emissions. We replace and upgrade equipment that has aged from years of operation in order to recover or increase its thermal efficiency.

At Matsushima Thermal Power Station, the high- and intermediate-pressure rotors of the steam turbines that powers the generator will be replaced during fiscal 2009 (no.1) and 2010 (no.2) to restore generating efficiency. In the process, we will adopt the latest technology to maintain and improve thermal efficiency, including high-performance blades optimally designed with the help of computer simulation.

High- and intermediate-pressure turbine rotors at Matsuura Thermal Power Station (Nagasaki Prefecture)

● Change in Thermal Efficiency of J-POWER Group Thermal Power Stations



Equipment Replacement at Hydropower Facilities

At hydropower facilities with aging equipment, we have undertaken the total replacement of key system components. The purpose is to prolong the life of the facility and improve the reliability of its equipment, while boosting power generation efficiency and capacity by incorporating the latest advances in design engineering.

At Tagokura Power Station (Fukushima Prefecture), work has been ongoing since 2004 under an eight-year plan to replace four water turbine generators and increase the facility's capacity from 380,000 kW to 400,000 kW. To date, the no. 4, no. 3 and no. 2 generators have been replaced and are operating commercially.

We launched a project to replace two water turbine generators at Nukabira Power Station in Hokkaido in 2006, and this replacement work was completed at the end of November 2009 and the generators commenced commercial operation.

In the future, we will proceed with large-scale upgrading work at other sites as well.

Replacement of key system components at Nukabira Power Station

Voice

RP-LUCID high-performance synthetic lubricant

Mitsuo Miyahara (left)
Kazuhiro Taki (center)
Megumi Sugawara (right)
Planning & Management Group, Thermal Power Engineering Department

RP-LUCID* is a high-performance lubricant perfected by the US firm Royal Purple using advanced additive technology centered on the proprietary additive Synerlec. This unique product achieves the ideal that has eluded previous lubricants by combining film strength, oxidation resistance, and excellent separation from water in one product. The use of RP-LUCID in our thermal power stations has resulted in fewer equipment failures and longer intervals between oil changes.

Use of the lubricant in the multiplying gears of our wind turbines has led to improved output performance, and we intend to expand its use over time.

* RP-LUCID: The original name of the lubricant is Royal Purple.

Okutadami Power (Fukushima Prefecture)

Topics

Development of Low-CO_2-Emission Power Sources

The J-POWER Group is doing its best to curb CO_2 emissions by building low-emission power sources in the form of nuclear power stations (see p. 21) and making effective use of such renewable energy as hydro-, wind, biomass, and geothermal power, while also working to perfect gas-turbine combined-cycle generation, which promises high efficiency of energy use.

J-POWER Group's Hydropower

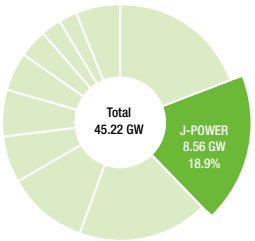
Hydropower uses the force of falling water to turn a water turbine and generate electricity. The typical approach is to build a dam on the upper reaches of a river and use the potential energy of the water stored in the dam reservoir to generate power. Power output can easily be adjusted to match demand by altering the amount of water used; when no electricity is needed, the turbine is stopped and the water stored up in the dam reservoir. In this way water is converted to electricity with a minimum of waste.

J-POWER has a half-century of experience developing, building, and operating hydroelectric power stations, from such large-scale facilities as Sakuma Power Station, which began operating in 1956, to our new pumped storage power stations, noted for their superior ability to adjust output to meet peak demand (see p. 26). Today J-POWER operates 59 hydroelectric power stations with a combined capacity of 8.56 GW, almost 20 percent the total installed capacity of Japan's hydropower facilities.

In fiscal 2009, J-POWER sold 9,210 GWh of electricity from these hydropower facilities for a CO_2 emissions reduction benefit of approximately 3.4 million t-CO_2. Today, the pressing need to combat global warming is stimulating renewed interest in hydroelectric power, a renewable resource.

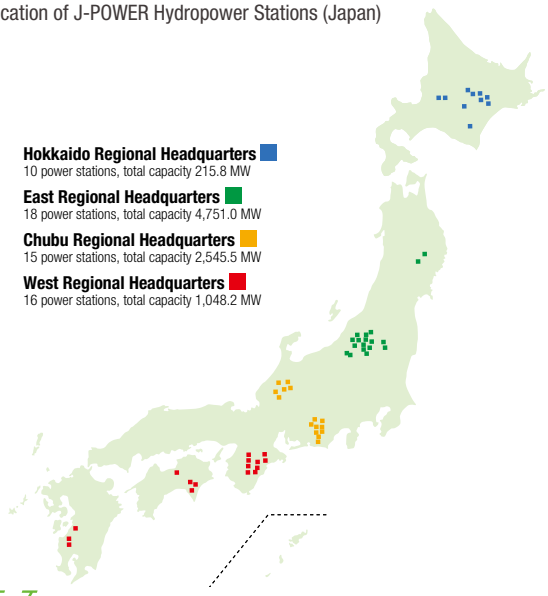
J-POWER is also working to upgrade its aging hydroelectric power facilities using the latest technologies to boost generating efficiency and further reduce the CO_2 intensity of our electric power generation (see p. 48). We are working to redevelop facilities in concert with dam projects being conducted by the government, and we are planning to commence redevelopment of the Isawa No. 1 Power Plant (Iwate Prefecture) from FY 2011.

● J-POWER Share of Japan's Installed Hydropower Capacity (as of March 31, 2010)



Note: Excludes home power systems.
Source: Agency for Natural Resources and Energy, Electric Power Statistics.

● Location of J-POWER Hydropower Stations (Japan)



Voice

Efficient use of water resources
— Maintenance flow generation —

Naoaki Shigetomi
Deputy Director
Koide Power Administration Office
East Regional Headquarters
Hydropower and Transmission System Department

Downstream from dams at hydroelectric facilities, the river flow rate is reduced in the section of the river up to the area where the water used in generation is discharged from the facility outlet. Because of this, following consultation with organizations affiliated with the Ministry of Land, Infrastructure, Transport and Tourism and other ministries, we have introduced river maintenance flow discharge in order to maintain the normal river flow rate.

The establishment of a generator in the river maintenance flow facility at Okutadami has enabled us to produce a maximum output of 2,700 kW while making efficient use of water resources.

References

Koriyama-Nunobiki Kogen Wind Farm (Fukushima Prefecture)

Wind Power Development

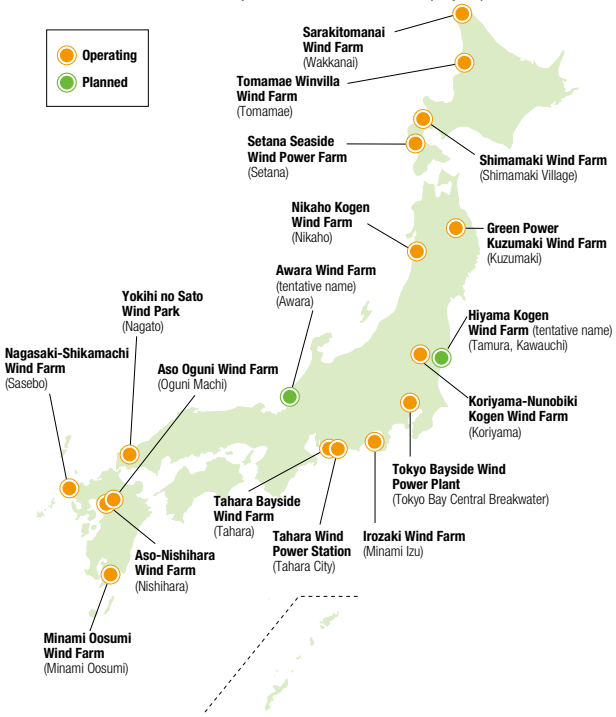
Wind power is a clean, renewable energy source that emits no CO_2 in the electricity generating process. In resource-poor Japan, expectations are high for this valuable, 100 percent domestic energy source.

Making maximum use of know-how accumulated through decades of experience building, operating, and maintaining hydroelectric and thermal power stations and transmission lines, the J-POWER Group is positioned to handle every phase of a wind power project, from the initial study of wind conditions and project planning to construction, operation, and maintenance.

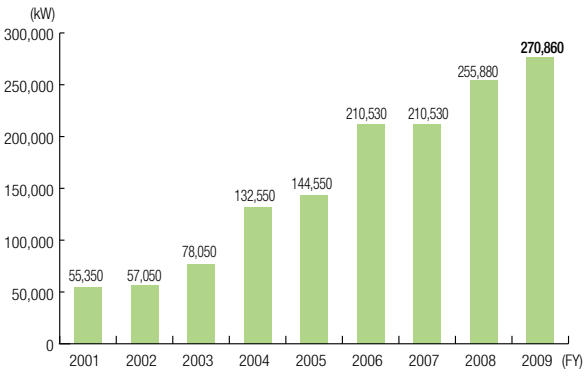
In fiscal 2009, we commenced commercial operation of the Shimamaki Wind Farm, the Tahara Wind Power Station, and the Aso Oguni Wind Farm (12 generators, 14.98 MW), and in April 2010 we commenced commercial operation of the Irozaki Wind Power Station (17 generators, 34 MW), for a total of 16 wind farms nationwide (184 generators, 304.86 MW). Altogether, the J-POWER Group's installed wind power capacity (prorated according to ownership share) accounts for approximately 12% of Japan's total. Overseas, operation of the Zajaczkowo Windfarm in Poland (24 generators, 48 MW) is proceeding smoothly.

Meanwhile, we are surveying and developing new sites in preparation for additional projects to follow. In addition, we are working constantly to improve operation efficiency and stability for even more effective utilization of wind energy.

● Locations of J-POWER Group Wind Power Facilities (Japan)



● Growth in J-POWER Group Installed Wind Power Capacity (Japan)



Note: Figures represent combined installed capacity of facilities in which J-POWER Group has an ownership interest, non-prorated.

Voice

Making Wind Power as Green as Possible

Kentarou Watanabe
Wind Power Engineering Group,
Wind Power Business Office
Environment & Energy Business Department

J-WIND TOKIO (100% owned by J-POWER), participated in the "Light-Down Campaign" instituted by the Ministry of the Environment, and during the campaign period, from June 20 to July 7, 2010, we assisted in efforts to reduce CO_2 emissions by turning off our illumination lights.

Beneficial Use of Biomass

Seeking to reduce emissions of CO_2, the J-POWER Group is working to make efficient use of biomass resources, for example by co-combusting sewage, woody biomass, non-industrial waste and other resources in coal-fired power stations.

Utilization of Sewage Sludge (Biosolid Fuel)

Biosolid fuel, produced by heating a mixture of sludge from sewage treatment plants and discarded cooking oil to remove the moisture (oil-heat depressurization drying method is employed), has approximately the same heating properties as coal. In fiscal 2006 we began cofiring biosolid fuel in the commercial facilities at the Matsuura Thermal Power Station (Nagasaki Prefecture) in the first such undertaking in Japan. Working within the constraints of limited fuel production, the facility co-fired about 650 tons of biosolid fuel in fiscal 2009, yielding approximately 1,500 MWh of electric power.

Biosolid fuel

Development of Biosolid Fuel Production Technology (low-temperature carbonization)

Low-temperature (250ºC–350ºC) carbonization improves the calorific value of sludge from sewage treatment plants by about 40 percent compared with high-temperature (600ºC–800ºC) carbonization processes, in addition to curtailing the amount of N_2O generated during sludge treatment. By pelletizing the dried sludge and adding steam prior to carbonization, this process also reduces the danger of spontaneous combustion while minimizing odor. By enhancing the value of biosolid fuel as a coal substitute, the technology can make a major contribution to the reduction of greenhouse gases. At the J-POWER Group, we are actively working to expand our production of biosolid fuel from sewage sludge, with a focus on its use in the coal-fired power stations owned by J-POWER throughout the country.

Low-temperature carbonization fuel

Utilization of Woody Biomass

Long-term trials of co-firing were begun at Matsuura Thermal Power Station (Nagasaki Prefecture) in fiscal 2008 (scheduled to end in fiscal 2009), in preparation for full-scale generation using woody chips fuel. In fiscal 2008 to 2009, the trials co-fired approximately 4,400 tons of woody biomass fuel and confirmed that plant equipment was not affected by co-combustion. We will commence full-scale generation using the fuel from fiscal 2010, and in the future we intend to co-combust approximately 12,000 tons of wood chips per year (representing a reduction of approximately 18,000 tons of CO_2).

Woody biomass co-firing

Efficient Use of Logging Residue in Japan's Forests

At J-POWER, we are seeking to make effective use of logging residue*1 that at present goes to waste, and to develop and introduce this material as a renewable energy source. Aiming towards the use of domestic logging residue as a fuel for power generation, we have joined together with the Miyazaki Prefecture Federation Forest Owners' Cooperative Association to establish a new company, Miyazaki Wood Pellet Co., Ltd., which will manufacture wood pellets. The new company was established in December 2009 in Kobayashi City, Miyazaki Prefecture. A wood pellet manufacturing facility will be constructed in FY 2010, and will commence operation from the end of the fiscal year. The wood pellets manufactured by the company will be used in the "Logging Residue Biomass-Coal Co-combustion Proving Project (Subsidized by the Ministry of Economy, Trade and Industry)" being conducted at the Matsuura Thermal Power Station.

Wood pellets

Testing Carbonized Fuel from Non-industrial Waste

The J-POWER Group is also working to develop technology for producing carbonized fuel from nonindustrial waste with biomass content with a view to encouraging use of untapped energy sources (for details, see p. 65).

COLUMN

Turning Sewage Sludge into Fuel in Hiroshima

On March 8, 2010, J-POWER jointly established a company called Bio-coal Hiroshima Seibu in order to produce biosolid fuel from sewage sludge at the Hiroshima City Seibu Water Resources Reclamation Center. This project will be Japan's first sewage sludge recycling operation to produce biosolid fuel using low-temperature carbonization technologies. This sewage sludge recycling and fuel manufacture project will be operated under a fully integrated system, from the design, construction, maintenance and operation of the facilities to sale of the fuel produced and co-combustion of the fuel in coal-fired thermal power stations. In recycling an estimated 27,000 tons of sewage sludge each year, 46% of the total amount generated by the city of Hiroshima, the program is expected to aid in the fight against global warming by reducing greenhouse gas emissions equivalent to 15,000 t-CO_2 at the sewage treatment center and the power station combined.

Exterior view of planned biosolid fuel production facilities (artist's rendering)

References

*1 Logging residue
Lumber and wood scraps left over after forestry operations, such as lumber from forest thinning and scraps, branches, etc., left over from clearing.

Tapping a Wide Range of Renewable Energy Sources

Increasing Output at the Onikobe Geothermal Power Station

An unusual number of volcanoes makes Japan a country rich in geothermal resources, with more than 100 hot springs measuring 90ºC or higher. Moreover, this 100 percent domestic, renewable energy source is virtually free of CO_2 emissions. In March 1975, we commenced operation of the Onikobe Geothermal Power Station in Miyagi Prefecture in order to make effective use of this precious and environmentally friendly geothermal energy, and we have worked hard to ensure the stable operation of the facility for 35 years.

We have dug a new producing well to tap the previously unused geothermal reservoir on the east side of the Onikobe facility, and in February 2010 we increased output from 12.5 MW to 15 MW.

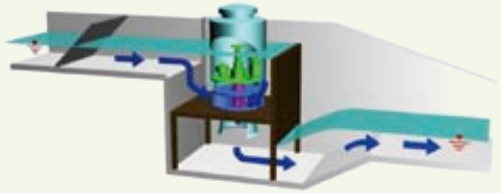
Meanwhile, we are conducting surveys to lay the groundwork for new geothermal projects in Japan and overseas. At present, we are conducting geothermal surveys and studying the feasibility of new geothermal developments in promising areas of Akita Prefecture. The J-POWER Group will go on contributing to cutting down CO_2 emissions via the effective utilization of geothermal energy.

Onikobe Geothermal Power Station (Miyagi Prefecture)

Small Hydropower

J-POWER is also moving forward with development of small hydropower to make beneficial use of an important untapped energy source of 100 percent domestic origin. Thus far we have provided design and construction supervision for a power station that makes use of an existing sediment control dam (Oita Prefecture) and a facility that uses the public water supply system (Mie Prefecture) as well as for the redevelopment of a hydropower station damaged by flooding (Mie Prefecture). We also participated in joint development of a micro hydropower*1 system ("hydro-agri") using falling water in existing irrigation channels, for which we carried out demonstration testing in Tochigi Prefecture and designed and built commercial facilities.

● Diagram of micro hydropower system using irrigation channel



Solar Power

In March 2008 operations began at Hibikinada Solar Power Station, which was built on reclaimed land in the Hibikinada district of Kitakyushu's Wakamatsu Ward. This solar power system, approved by the New Energy and Industrial Technology Development Organization (NEDO) in fiscal 2007 as a Field Test Project on New Photovoltaic Power Generation Technology, has an installed capacity of 1,000 kW (1 MW). It consists of 5,600 solar cell modules of the polycrystal silicon type, each measuring 1.29 by 0.99 meters. The field test is measuring and analyzing various actual-load operating data over a period of four years to evaluate a new type of control system using a high-capacity power conditioner. In one year, the facility generated about 1,150 MWh of electricity, for an emissions reduction benefit of about 500 t-CO_2.

Hibikinada Solar Power Station (Kitakyushu)

Voice

Consideration of the Environment at Our Geothermal Power Station

Masato Sasaki
Director
Onikobe Geothermal Power Station
Thermal Power Department

Expectations are high on geothermal energy as an important element in the realization of a low-carbon society. We are working to ensure stable operation of our station, while also considering the environment in construction work and facility operation, for example by disturbing the natural environment as little as possible (minimizing earthworks, saving the existing vegetation), attempting to harmonize with the environment (considering the size and the color of the facility, minimizing noise), and protecting natural mechanisms (recirculation of hot water underground, prevention of leakage into rivers).

*1 Micro hydropower
Hydroelectric power installations with a capacity of 100 kW or less

Development, Transfer, and Dissemination of New Technologies

The J-POWER Group is working from a variety of directions in attempting to develop new technologies enabling coal, a precious natural resource, to be used as an energy source more efficiently and with less impact on the environment. This special feature discusses our efforts towards the transfer and diffusion of ultra supercritical (USC) pressure technologies (see p. 12).

EAGLE Project Initiatives

External view of EAGLE Pilot Plant test facility (Wakamatsu ward, Kitakyushu)

What is the EAGLE*1 Project?

The EAGLE Project is a technological development project that seeks to develop the ultimate clean coal technology, balancing the efficient use of coal with the achievement of zero emissions of CO_2.

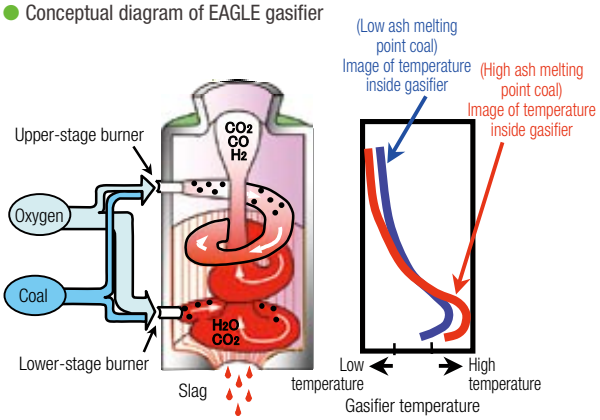
J-POWER has been vigorously pursuing the EAGLE Project in its Wakamatsu Research Institute Technology Development Center, located in Kitakyushu, since fiscal 2002. The aim of the project is to convert coal into a combustible gas (consisting mainly of CO and H_2), and to realize an integrated coal gasification combined cycle (IGCC) system in which this gas is used to drive a gas turbine to produce electricity and, at the same time, the exhaust heat is used to drive a steam turbine to generate electricity. By means of this project, J-POWER has developed an "oxygen-blown coal gasifier that can be used with a wide range of coal types," and has also established the world's first "technology for the separation and capture of CO_2 from coal gas in a coal gasification generation system."

At present, projects of this type are positioned as an important area of development among the development projects being conducted as part of "Cool Earth 50," a Japanese initiative to combat global warming, and the outcomes of the EAGLE Project have been very well received.

Revolutionary CO_2 capture/coal gasification technology

High-efficiency coal-fired generation and carbon dioxide capture and storage (CCS) technologies will be essential to the achievement of the target of Japan's Cool Earth 50 initiative, the halving of CO_2 emissions by 2050. The development of CO_2 capture processes that minimize any decline in generation efficiency will be an important factor in accelerating the practical use of CCS.

● Conceptual diagram of EAGLE gasifier



▶ Control of the temperature in the gasifier results in excellent gasification performance.
▶ The unit is applicable to many coal types, from low ash melting point to high ash melting point coals.

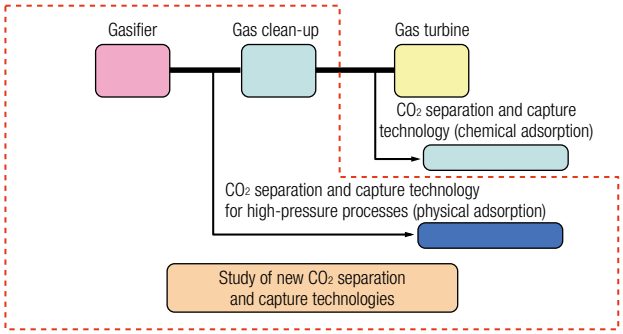
● EAGLE Pilot Plant test facility specifications

Type of coal gasifier	Oxygen-blown two-stage entrained bed
- Volume of coal processed	150 tons/day
- Gasification pressure	2.5 MPa
- Gasification temperature	1,500 – 1,600ºC
Capture method for CO_2 separation and capture unit	Chemical adsorption
- Volume of gas produced	1,000 m^3N/h
- CO_2 capture performance	Approx. 24 tons/day
- Purity of captured CO_2	99% or higher
Type of generation	Gas turbine generation
- Output	8 MW

The EAGLE facility is being used as the testing ground for an innovative technology that combines coal gasification with CO_2 capture, and this R&D project is striving to achieve high efficiency in the IGCC+CO_2 separation and capture system.

The main thrust of the research is to develop a CO_2 separation and capture technology (using a physical adsorption method) for high-pressure processes based on projections of the next generation of IGCC (1,500ºC and 1,700ºC gas turbines), and to conduct a study of new CO_2 separation and capture technologies. The project is scheduled for the four-year period from fiscal 2010 to fiscal 2013, and fully fledged test operation will commence from fiscal 2011.

● Conceptual diagram of R&D for revolutionary technology combining coal gasification with CO_2 capture



References

*1 Coal Energy Application for Gas Liquid & Electricity
Development of multi-purpose coal gasification technology

Establishment of Osaki CoolGen Corporation

In July 2009, Chugoku Electric Power Co., Inc. and J-POWER jointly established a new company, Osaki CoolGen Corporation, in order to proceed efficiently with large-scale proving trials of "oxygen-blown coal gasification combined generation (oxygen-blown IGCC) technologies" and "CO_2 separation and capture technologies."

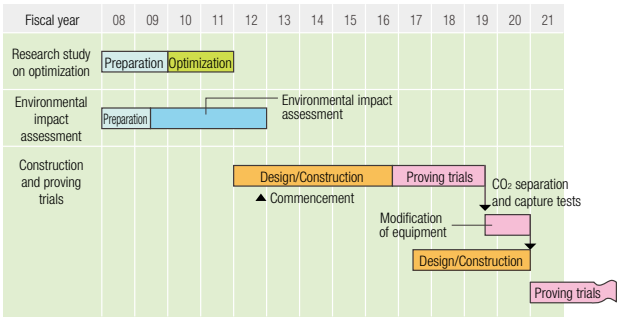
Both companies position coal as an important energy resource from the perspectives of stability of supply and economic efficiency, and have worked to increase the efficiency of its use through the achievement of high-temperature and high-pressure steam conditions in coal-fired power stations. Today, responding to the problem of global warming is an urgent issue, and since fiscal 2006 Chugoku Electric Power Co., Inc. and J-POWER have conducted joint studies based on the results of the EAGLE (multi-purpose coal gasification technology) project towards the development of oxygen-blown IGCC technologies. These are innovative technologies that seek to reduce carbon emissions through the achievement of even higher efficiency and greater cleanness. We have been proceeding with the preparations for large-scale proving trials on the grounds of Chugoku Electric Power Co., Inc.'s Osaki Power Station (Kamijima-cho, Toyota-gun, Hiroshima Prefecture).

Osaki CoolGen Corporation intends to construct a large-scale 170 MW facility for proving trials of an oxygen-blown coal gasification technology. Here, the company will conduct tests to verify the reliability, economic efficiency and operability of an oxygen-blown IGCC system. Following on from this, the company will test the application of the latest CO_2 separation and capture technologies. In steadily moving ahead with these trials, we will also increase the potential for the future realization of integrated coal gasification fuel cell cycle system (IGFC) technology, which will enable the achievement of even greater efficiency through the combined use of large-scale fuel cells.

Osaki CoolGen Corporation will begin construction of its facility in March 2013, and seeks to commence proving trials in March 2017.

The roadmap outlined in the government's Cool Earth – Innovative Energy Technology Program positions the technologies discussed above as important areas of technological development in "high-efficiency coal-fired power generation" and "CO_2 capture and storage." The development project also aims to realize the "Cool Gen Project*1" proposed in a report made by a government deliberative committee.

● Future schedule

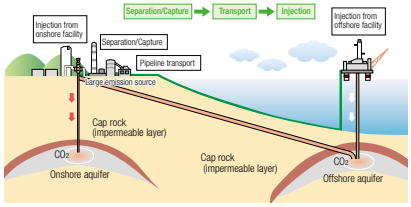


A Variety of Initiatives in the Area of Technologies related to CO_2 Capture and Storage (CCS)

What are CCS Technologies?

CCS technologies are technologies for the separation and capture of CO_2 from large-scale emission sources such as coal-fired power stations, and, following transportation, its stable storage deep underground (1,000 m or more). They are considered to be promising technologies in combating global warming. Based on our experience in the operation and maintenance of power stations, we have adopted a user's perspective in conducting development programs to seek a method of CO_2 separation and capture suited to use in power stations, in addition to engaging in research that will shed light on the behavior of CO_2 in underground storage.

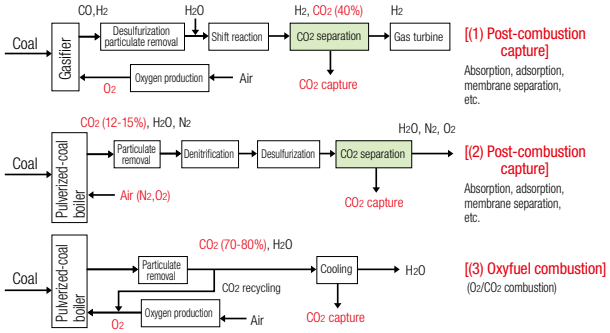
● CCS Concept



Source: Reference material for March 14, 2006 meeting, Global Environment Committee, Central Environment Council

CO_2 Capture from Coal-Fired Power Generation

There are three basic approaches to separating and capturing CO_2 from coal-fired thermal power generation: (1) pre-combustion capture, (2) post-combustion capture, and (3) oxyfuel combustion. Pre-combustion capture can be used in IGCC and IGFC plants that gasify coal, while post-combustion capture and oxyfuel combustion are suitable mainly for PCF power stations. We are working on development of technology for all three types of CO_2 separation and capture, aware that PCF power stations, which burn coal to generate energy, are currently widespread, while combination systems using high-efficiency IGCC and IGFC generation with CCS offer great potential for the future.



Study of an Integrated System for CO_2 Capture and Storage: The Callide Oxyfuel Combustion Project

Oxyfuel combustion supplies the boiler with oxygen instead of air for combustion, with the aim of increasing the concentration of CO_2 in exhaust gas so that less energy is needed for CO_2 capture. The J-POWER Group is participating in the Callide Oxyfuel Combustion Project, being conducted at the Callide A Power Station (pulverized coal-fired, 30 MW) in Queensland, Australia. This project is conducting the world's first demonstration of an integrated system for the capture and underground storage of CO_2 using oxyfuel combustion technology. Test operation of the system is scheduled to commence in 2011.

*1 Cool Gen Project
The Cool Gen Project is a plan proposed in June 2009 by the Clean Coal Subcommittee of the Mining Committee of the Advisory Committee for Natural Resources and Energy of the Ministry of Economy, Trade and Industry. The project seeks to promote research towards the realization of "zero-emission coal-fired generation" through the combination of IGCC, IGFC (which aims towards the ultimate form of coal-fired generation), and CO_2 capture and storage (CCS).

Utilization of the Kyoto Mechanisms and Other Measures

The J-POWER Group has been moving forward with application of the Kyoto Mechanisms, with an emphasis on CDM Project development. The CDM (Clean Development Mechanism; see chart below) and JI (Joint Implementation)*1 are essential mechanisms for minimizing Japan's economic burden and keeping Japanese industry internationally competitive, and the J-POWER Group is actively involved in efforts to earn and make use of carbon credits through these programs.

Overview of CDM Project Development

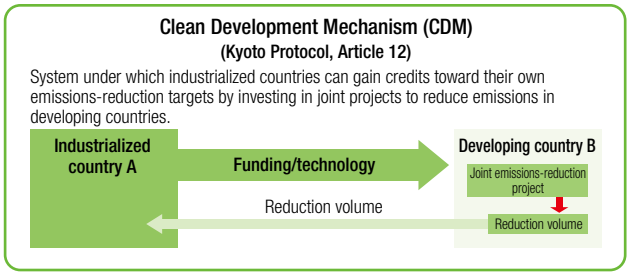
The Kyoto Protocol sets numerical targets to reduce greenhouse gas emissions for industrialized nations. Under the protocol, the Kyoto Mechanisms (CDM, JI, and emissions trading) have been established as tools by which industrial nations can achieve their targets in an economically rational manner while providing technical and financial support for emissions reduction in developing countries.

The J-POWER Group began moving proactively to take advantage of the CDM even before the Kyoto Protocol went into effect in February 2005. The reason for the focus on CDM was that, unlike JI and emissions trading, for which carbon credits were not to be issued until 2008, the CDM applied to activities undertaken from 2000 on, making it possible to earn credits even before 2008.

In order to accumulate experience, we began by participating in a large number of small-scale projects. Focusing on Central and South American countries that have actively embraced the CDM, we assisted in a broad range of activities required for official CDM registration. As the date of the protocol's enforcement neared, we broadened our focus to include Asia and began to participate in large-scale projects as well.

Of the CDM/JI related projects in which we have been involved, eight had been registered with the CDM Executive Board*2 and one had been registered as JI as of the end of March 2010.

● Outline of Clean Development Mechanism



● CDM/JI projects developed with J-POWER participation (registered/completed)

Country	Project name	Description
Chile	Graneros Plant Fuel Switching Project	Switch to natural gas in conjunction with renovation of facilities
Chile	Metrogas Watt's Alimentos Package Cogeneration Project	Introduction of cogeneration for improved energy-use efficiency
Colombia	La Vuelta and La Herradur Hydroelectric Project	Use of renewable energy sources
Brazil	Aquarius Hydroelectric Project	Use of renewable energy sources
Brazil	Caieiras landfill gas emission reduction	Combustion of landfill gas to reduce greenhouse gases
China	Sichuan Erdaoquio Hydropower Project	Use of renewable energy sources
China	Taibai Guanyinxia Hydropower Station	Use of renewable energy sources
China	Changzhou Panshi Cement Waste Heat Recovery for Power Generation Project	Waste heat recovery for power generation
Hungary	Geothermal methane gas utilization	Capture and utilization of methane gas produced by a hot spring

Major Activity in FY 2009

■ Participation in CDM/JI Projects

In fiscal 2009, the Taibai Guanyinxia Hydropower Station (Shaanxi, China), a renewable energy project utilizing hydroelectric generation, and the Changzhou Panshi Cement Waste Heat Recovery for Power Generation Project (Jiangsu, China), a project for the recovery and use of waste heat, were registered as CDM projects with the CDM Executive Board. In addition, a project for the geothermal methane gas*3 utilization in Hungary was formally approved as a JI project.

In Central and South America, Asia, and Eastern Europe, we are conducting onsite surveys and supporting CDM and JI development for projects involving the use of renewable energy sources such as hydropower and the utilization of methane gas from hot springs, among other initiatives.

Capture and utilization of methane gas produced by a hot spring

Changzhou Panshi Cement Waste Heat Recovery for Power Generation Project (Jiangsu)

■ Measures to Obtain Domestic Carbon Credits

In fiscal 2009, we began working on CO_2 emissions reduction projects based on the domestic carbon credit system. We made applications and obtained registration for projects with two companies seeking to reduce their emissions. The first of these involved the use of a new boiler fuel at Shofuku no Yu (Yaizu City, Shizuoka Prefecture), a bathing facility owned and operated by Tsuchiya Corporation. This project reduced CO_2 emissions by approximately 230 tons per year. The second project concerned the replacement of boilers used for cleaning purposes at the Tokyo factory of United Linen Supply Co., Ltd. (Ota Ward, Tokyo), and generated a reduction in emissions of approximately 250 tons per year. (See p. 34) In the future, we will continue to actively seek out opportunities for CO_2 reduction projects in Japan.

References

*1 Joint implementation (JI)
Mechanism whereby Annex I countries can jointly carry out GHG emissions-reduction projects and distribute the resultant reduction volume among the countries concerned. Applicable to reductions between 2008 and 2012.

*2 CDM Executive Board
Body charged with oversight of CDM projects. Responsible for accrediting designated operational entities (DOEs), registering CDM projects, and issuing certified emission reductions (CERs).

*3 Geothermal methane gas
A natural gas, the main constituent of which is methane, released when hot spring wells are excavated

Participation in Carbon Funds

As part of our ongoing effort to secure emissions credits efficiently through CDM and JI, J-POWER contributes to the following carbon funds:

- Japan Greenhouse Gas Reduction Fund (JGRF)
- Dexia-FondElec Energy Efficiency and Emissions Reduction Fund

CDM Project Close-up

The Taibai Guanyinxia Hydropower Station in Shaanxi, China

The CDM project being conducted at the Taibai Guanyinxia Hydropower Station in China's Shaanxi Province, in which J-POWER is involved, was registered as a CDM project by the UN's CDM Executive Board on December 25, 2009, and commenced operation in June 2010.

The main actor in the implementation of the project, the Taibai County Xushui River Hydropower Development Co., Ltd., is a company that develops and manages hydroelectric generation projects. The facility employs a regulating capacity reservoir, and consists of two generators with a capacity of 13 MW each, for a total installed capacity of 26 MW. The electricity generated will be supplied to the Northwest Power Grid Co., Ltd. The purpose of the project is to generate electricity using renewable water resources, and to enable the replacement of some electricity generated by fossil fuel-fired plants by supplying this electricity to the Northwest Power Grid Co., Ltd., which mainly uses thermally generated electricity. The project is expected to reduce annual greenhouse gas emissions by approximately 72,000 tons.

We provided support for the CDM development of this project, including the formulation of a Project Design Document (PDD), essential for consideration as a CDM project, which includes details such as the project outline, the effect of the project in reducing greenhouse gas emissions, and an environmental impact assessment.

History	
Apr. 22, 2008	Authorization by government of host country, China
Oct. 1, 2008	Authorization by Japanese government
Dec. 25, 2009	Registration by CDM Executive Board

Installation of water turbine liner and casing, Taibai Guanyinxia Hydropower Station (Shaanxi, China)

The Kyoto Mechanisms and the J-POWER Group's CO_2 Intensity Target

Such Kyoto Mechanisms as CDM and JI allow industrially developed nations to earn carbon credits to offset their own emissions by taking part in emissions reduction projects in other countries. CDM and JI were adopted under the Kyoto Protocol to help achieve the emissions reduction targets at the lowest possible cost. By implementing programs to reduce CO_2 emissions in developing countries and elsewhere, a country like Japan, whose energy conservation measures have progressed to the point where further reductions in greenhouse gas emissions can only come at considerable cost, to pursue more cost-effective CO_2 emissions at the global level, while encouraging emissions reduction in developing countries.

With this in mind, we have been working actively to earn and use credits via CDM and JI. When calculating the J-POWER Group's progress toward its CO_2 intensity reduction target, we offset our CO_2 emissions from power generation with the carbon credits transferred to Japan through our CDM and JI projects.

Voice

Where Credits are Generated!

Kazuhiko Tsuyuki
Carbon Credit Group
Climate Change Office
Corporate Planning & Administration Department

In September 2009, I made a journey of about two hours by car into the mountains, from the area of the epicenter of the Sichuan earthquake to the Sichuan Erdaoquio Hydropower Project. Emission credits are obtained here for the reduction in CO_2 emissions by the replacement of thermally generated electricity by hydropower. At the actual plant site, local young people oversee the operation of the facility and the maintenance of its equipment. This was an important facility for the local region at the time of the Sichuan earthquake, maintaining a supply of electricity to surrounding cities. I want us to continue seeking out projects that make a significant contribution to the regions where they are conducted, and lending a hand in projects that reduce CO_2 on a global level.

Efforts to Curb Greenhouse Gas Emissions

In the J-POWER Group we are taking appropriate steps to control CO_2 and other greenhouse gases (SF_6, HFCs, PFCs, N_2O, and CH_4) to minimize emissions. Please refer to p. 45 on "CO_2 Emissions in Fiscal 2009."
We are also taking the necessary steps to control emissions of specified CFCs and halons that deplete the ozone layer.

Measures to Curb Greenhouse Gases Other than CO_2

The Kyoto Protocol covers five greenhouse gases in addition to CO_2. Where emissions by the electric utility industry are concerned, the contribution of these other gases to global warming is about 1/370 that of CO_2.*

One of these, SF_6, is a gas which displays excellent insulating performance and is safe and stable. It is used in the electricity industry in gas circuit breakers, gas-insulated switchgears, and other devices. In order to limit the release of SF_6 into the atmosphere, we have established as targets the achievement of a 97% or higher recovery rate when equipment is inspected, and a 99% or higher rate when equipment is retired, and we are working consistently to recover and reuse the substance. In 2009, our recovery rate during both inspection and retirement of equipment was 99%.

* Federation of Electric Power Companies of Japan, Environmental Action Plan by the Japanese Electric Utility Industry (September 2009).

● Measures for Reducing Emissions of Other Greenhouse Gases

Gas	Applications and measures for reducing emissions
Sulfur hexafluoride (SF_6)	Used for insulation in gas insulation equipment. The J-POWER Group works to reduce emissions through rigorous recovery and reuse during inspection and disposal. In 2009, our rate of recovery and reuse was 99 percent.
Hydrofluorocarbons (HFCs)	Used as refrigerant in air-conditioning equipment, etc. Their use is expected to increase as they are adopted to replace CFCs regulated in Law Concerning the Protection of the Ozone Layer. The J-POWER Group works to reduce HFC emissions through cooperative efforts to recover and reuse such gases, as well as preventing leaks during installation and repair.
Perfluorocarbons (PFCs)	PFCs may be used as refrigerants and insulating agents for transformers, but are not stocked by the J-POWER Group.
Nitrous oxide (N_2O)	N_2O is released by the combustion of fossil fuels, but we are working to minimize emissions through measures such as increasing the efficiency of thermal power stations. (In fiscal 2009, emissions totaled approximately 1,610 t.)
Methane (CH_4)	As CH_4 concentrations in flue gases from thermal power stations are below average atmospheric concentrations, emissions are effectively zero.

Protecting the Ozone Layer

The ozone layer in the upper stratosphere (about 20 – 40 km above the earth) plays an important role in protecting life on earth by absorbing harmful ultraviolet rays in sunlight. However, there are concerns that when released into the environment, specified chlorofluorocarbons (CFCs) and halons, which are widely used as refrigerants and cleaning agents, reach the stratosphere and there, through exposure to powerful ultraviolet rays, produce chlorine and bromine that can destroy the ozone layer. This will impact seriously on human health and the earth's ecosystems. For this reason, the volume of production and use of these substances has been restricted internationally.

In the J-POWER Group, we periodically monitor our stocks and consumption of these substances and are working to limit their emission through proper management and control. (see p. 78)

● Stocks and consumption of specified chlorofluorocarbons and halons

Category	End of fiscal 2009 (tons)		Use
Specified chlorofluorocarbons	Stock: 1.0	Consumption: 0.0	Refrigerant
Halons	Stock: 4.6	Consumption: 0.0	Fire extinguishers
Other chlorofluorocarbons, etc.	Stock: 12.4	Consumption: 0.1	Refrigerant
Total	Stock: 18.0	Consumption: 0.1	———
Alternative chlorofluorocarbons (HFCs)	Stock: 11.2	Consumption: 0.2	Refrigerant

About Specified Chlorofluorocarbons and Halons

Ozone layer-depleting substances are chemically stable substances containing chlorine or bromine in their molecules, such as specified chlorofluorocarbons and halons. Like HFCs, PFCs, and SF_6, these substances are also strong greenhouse gases.

The Act for Protection of the Ozone Layer through Regulation of Designated Substances, etc., terms substances that are regulated based on the Montreal Protocol "Designated Substances," and stipulates a phased reduction of the volume of production and consumption of these substances in accord with the regulation schedule. As a result, production of halons was completely phased out at the end of 1993, and production of specified chlorofluorocarbons at the end of 1995. The production of other ozone layer-depleting substances is also being successively phased out.

References

Stepping Up Energy Conservation

Larger Coal Carriers for a Lighter Environmental Load

In the J-POWER Group, we have moved towards the use of larger Panamax*1 coal carriers (90,000 tons) when contracting with shipping companies.

The use of larger bulk carriers makes it possible to cut back on the amount of shipping fuel consumed per ton of coal transported, which in turn reduces the environmental load from shipping (emissions of CO_2, sulfur oxides, and nitrogen oxides).

Coal carrier docking at coal pier (Ishikawa Thermal Power Station, Okinawa Prefecture)

Marine Transport of Coal Ash

Coal ash is the residue generated when coal is burned in coal-fired thermal power stations.

In fiscal 2009, approximately 1.67 million tons of coal ash was generated and shipped from power stations to cement plants and other locations around the country to be recycled as raw material for cement or land reclamation material. In the J-POWER Group, we use dedicated carriers and other marine transport for approximately 90% of the coal ash we ship. This use of maritime transport enables us to reduce CO_2 emissions per unit transported. Greater reliance on maritime transport also helps mitigate congestion on our roads.

District Heating Projects in the Middle East

J-POWER has joined together with Sumitomo Corporation and the United Arab Emirates (UAE)-based company Tabreed to establish Sahara Cooling Limited, and will take part in a district cooling project in the UAE. J-POWER has already provided consulting services for district heating projects in Japan and overseas, and we are building on that experience together with our expertise in the design, management, maintenance and operation of hydroelectric and thermal power stations, to improve the operating stability and increase the efficiency of the system's cooling plants.

At present, the UAE district cooling project involves six cooling plants with a total capacity of 54,500 RTs*2. District cooling helps save energy by centralizing the thermal energy source for greater efficiency and by permitting load leveling among multiple users. Tabreed has estimated that by shifting to a district cooling system, the UAE could cut energy consumption by 55% compared with the use of individual cooling units.

With demand recently growing in the UAE and neighboring countries for environmentally friendly, energy-saving district cooling systems, J-POWER plans to expand its Middle East operations and to continue taking part in projects designed to reduce the burden on the environment.

Interior view of heat supply plant

Curbing Energy Use at the Office and at Home

The J-POWER Group's business sites follow such energysaving policies as lights off during lunch break, reduced power supply to equipment on standby, and environmentally-friendly driving. In addition, we make a point of selecting equipment meeting strict specifications for energy efficiency whenever we build new office buildings or replace company vehicles.

One critical component of Japan's overall effort to combat global warming is stepped-up energy-conservation efforts in the commercial sector, which includes offices. To this end the J-POWER Group has adopted corporate targets to step up energy-conservation efforts in our offices. Through Group-wide initiatives, our employees are working as a team to meet to meet those targets (see p. 41).

We have also commenced activities using the Ministry of the Environment's "Household Eco-Account Book (The Environment Minister of Our Home)," as a means of encouraging our employees to save energy and resources in their own homes.

http://www.eco-family.go.jp/index.html (Japanese only)

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Receipt of 10th Physical Distribution and Environmental Protection Award

J-POWER received this award together with Jpec Co., Ltd. and KAWASAKI KINKAI KISEN KAISHA, LTD. for the coal transporters "JP COSMOS" and "JP TSUBAKI," operating on the Isogo Thermal Power Station route. The transporters are fitted with self-unloading equipment*3, enabling the cargo to be unloaded without the coal being exposed to the exterior. By this means, we have realized environmentally friendly cargo handling that produces less dust and noise.

Self-unloading transporter "JP COSMOS"

*1 Panamax
The largest category of ship that can transit the Panama Canal. For bulk carriers, this usually means a cargo capacity of 60,000 to 90,000 tons.

*2 RT (refrigeration ton)
A unit used to measure refrigerating capacity. 1 RT is the thermal energy necessary to freeze a ton of water at 0°C in 24 hours. 1 RT is also about the capacity needed to cool the average Japanese house.

*3 Self-unloading equipment
Equipment that directly connects the unloading equipment on the ship side and the receiving equipment on the land side, enabling the coal to be directly sent to the receiving equipment via a conveyor belt.

Part 3

Efforts Relating to Local Environmental Issues

The J-POWER Group understands that the basis for harmony with local communities is to ensure the safety and preserve the living environment of the residents by taking measures to minimize the environmental impact of our operations.

Topics

Preserving Biodiversity

In all its business activities, the J-POWER Group considers their impact on biodiversity and strives for harmonious coexistence with the natural environment. When building a new power station or other facility, we carry out environmental impact assessments and adopt appropriate environmental safeguards with the views of local residents in mind. In addition, we carefully monitor outcomes as we pursue environmental policies oriented to harmonious coexistence with nature.

Steps to Preserve Biodiversity

Northern Japanese Macaque

The Ohma Main Transmission Line (see p. 22) passes through an area with a rich natural environment, to which we have given careful consideration in the construction of the line. The area is home to the northern Japanese macaque, a protected species, and to endangered bird species including the mountain hawk-eagle and the northern goshawk. We have sought to minimize our impact on these species, and to this end we have adopted a variety of conservation measures based on the opinions of academic experts.

We have taken further active steps to protect the environment of the region, endeavoring to raise the awareness of all the personnel involved in the construction work concerning the protection of endangered plants and animals. All personnel have been issued with a conservation handbook indicating the appropriate actions if they discover any endangered animal or plant species, and as necessary we have also transplanted rare plant species that were threatened by the construction work.

Northern Japanese Macaque

Blakiston's Fish-owl, Tokachi District, Hokkaido Prefecture

The Tokachi district of Hokkaido is home to Blakiston's fish-owl, classified as "endangered IA" in the Japanese Environment Ministry's Red Data Book (critically endangered in Hokkaido). The J-POWER Group is taking care to minimize any impact on the owl population, as by scheduling work in the area for times other than the nesting season.

Blakiston's fish-owl (photo: Kushiro Zoo)

Japanese Golden Eagle, Okutadami-Otori Area

The area around Okutadami Dam and Otori Dam (Fukushima Prefecture, Niigata Prefecture) is home to the Japanese golden eagle, ranked as "endangered IB" in the Environment Ministry's Red Data Book. The J-POWER Group is helping protect the eagles by avoiding outdoor work on these dams during the eagle's nesting season. If work needs to be carried out in the vicinity, we determine the status of nesting activity, seek the advice of local ornithological experts, and take precautions to reduce vehicle traffic and noise level so as to minimize the impact on nesting activity.

Young Japanese golden eagle

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E-learning Program for the Protection of Biodiversity

The United Nations has proclaimed 2010 the International Year of Biodiversity. Taking into consideration the fact that the 10th meeting of the Parties to the Convention on Biological Diversity (COP10) will be held in Nagoya in October, in April of this year the Federation of Electric Power Companies of Japan announced the "Electric Utility Industry's Action Guidelines for Biodiversity" (see p. 79). Against this background, the J-POWER Group reaffirms that its corporate activities stem from various blessings offered by the natural environment, and in fiscal 2010 we are conducting an e-learning program concerning biodiversity for all employees, attempting to deepen their understanding of the vital link between humanity and nature. The blessings of nature sustain all of our lives, and promoting a genuine understanding of those blessings is therefore a step in the right direction.

Screen from e-learning program on biodiversity

Harmony with the Aquatic Environment

River Maintenance Discharge

At hydropower stations with dams, the river water taken in upstream from the dam is conducted to the station (positioned downstream from the dam) via a conduit, and this results in a reduction in the rate of flow between the dam and the point of discharge into the river from the generator. Because of this, we carry out river maintenance flow discharges in consultation with the Ministry of Land, Infrastructure, Transport, and Tourism and other relevant agencies, by releasing an appropriate amount of stored water from the dam.

This is part of our environmental considerations, and in conducting these river maintenance flow discharges we are benefiting fish and other aquatic creatures and their ecosystems downstream from the dam.

River maintenance flow discharge from Futatsuno Dam (Nara Prefecture)

Restoration of Wetlands

Plans connected with the Okutadami-Otori Hydro Power Expansion Project called for rock generated during excavation to be used as landfill on the left bank downstream of the Okutadami Dam. Because the area hosted a mountain ecosystem that depends on a wetland environment, a plan was devised to conserve the wetland ecosystem while proceeding with the landfill by creating a new wetland to take the place of the old. Meticulous attention was paid, such as by transplanting the flora carefully and allowing the old and new wetlands to exist together for as long as possible to allow dragonflies and other wildlife to migrate naturally. In fiscal 2005, these efforts were recognized and awarded the Japan Society of Civil Engineers Environment Award.

Since then, we have confirmed the continuing presence of rare dragonfly species in the area, which includes a newly created pond downstream from the new wetland. We will continue conducting surveys to track changes in flora and fauna following the restoration, striving to further enhance the efficacy of our conservation efforts.

Pond created in area adjacent to new wetland

Water Quality of Dam Reservoirs

Typhoons and torrential rains can cause mud to flow into rivers, and dam reservoirs have an inherent tendency to retain this muddy water. When this happens, water released from the dam for power generation purposes can prolong the river turbidity. In the J-POWER Group, we monitor the water quality of our dam reservoirs by installing turbidimeters and performing water quality analyses on water samples. We also monitor changes in turbidity during periods of heavy runoff so that we can take appropriate countermeasures, as by using dam discharges to pass turbid water through quickly or installing surface-water intake systems that permit intake of the relatively clear water at the surface. In areas where turbidity is severe, we are taking preventive measures by working with national and prefectural governments in their forest management and afforestation programs.

Surface-water intake equipment (Ikehara Dam, Nara Prefecture)

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Control of Reservoir Sediment

Each year large quantities of earth flow into dam reservoirs from upstream, and a portion of it builds up as sediment at the bottom of the reservoir. This can cause the level of the river bottom to rise, raising the risk of flooding when rains or melting snow cause the river level to rise upstream. To prevent this, we control sediment by dredging and removing it or transporting it to another part of the reservoir.

Dredger (Sakuma Dam, Shizuoka Prefecture)

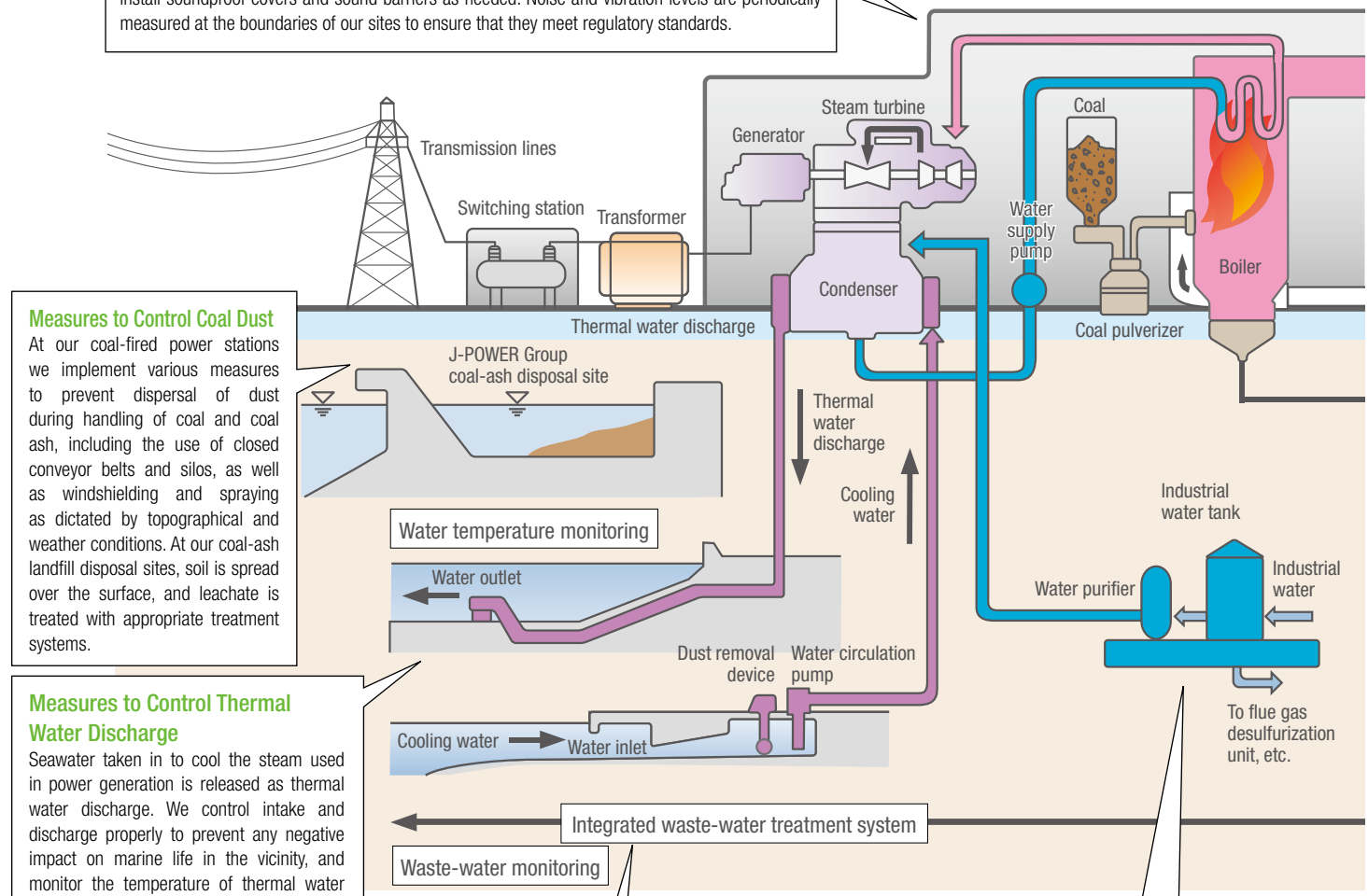
Reduction of Environmental Load

In the J-POWER Group, we protect the environment by using the latest environmental technology and know-how to prevent air and water pollution, noise, and vibration, so as to minimize the impact of our activities on the local environment due to air or water pollution resulting from the operation of our coal-fired power stations.

Environmental Measures at Coal-Fired Power Stations

Noise and Vibration Control

We work to prevent noise and vibration pollution by keeping such noise- and vibration-emitting equipment as boilers, turbines, and exhaust fans inside buildings. For outdoor equipment, we install soundproof covers and sound barriers as needed. Noise and vibration levels are periodically measured at the boundaries of our sites to ensure that they meet regulatory standards.



Measures to Control Coal Dust

At our coal-fired power stations we implement various measures to prevent dispersal of dust during handling of coal and coal ash, including the use of closed conveyor belts and silos, as well as windshielding and spraying as dictated by topographical and weather conditions. At our coal-ash landfill disposal sites, soil is spread over the surface, and leachate is treated with appropriate treatment systems.

Measures to Control Thermal Water Discharge

Seawater taken in to cool the steam used in power generation is released as thermal water discharge. We control intake and discharge properly to prevent any negative impact on marine life in the vicinity, and monitor the temperature of thermal water discharge around the clock to ensure that it remains within the limits established by environmental agreements.

Water Pollution Control

Waste water from such facilities as desulfurization units and offices is appropriately treated in integrated waste-water treatment systems, through coagulation, precipitation, filtration, and so forth. Treated water is routinely monitored by automatic measuring equipment and analyzed periodically to ensure that it meets the standards set under the Water Pollution Control Law and environmental conservation agreements.

Cutting Back on Industrial Water Use

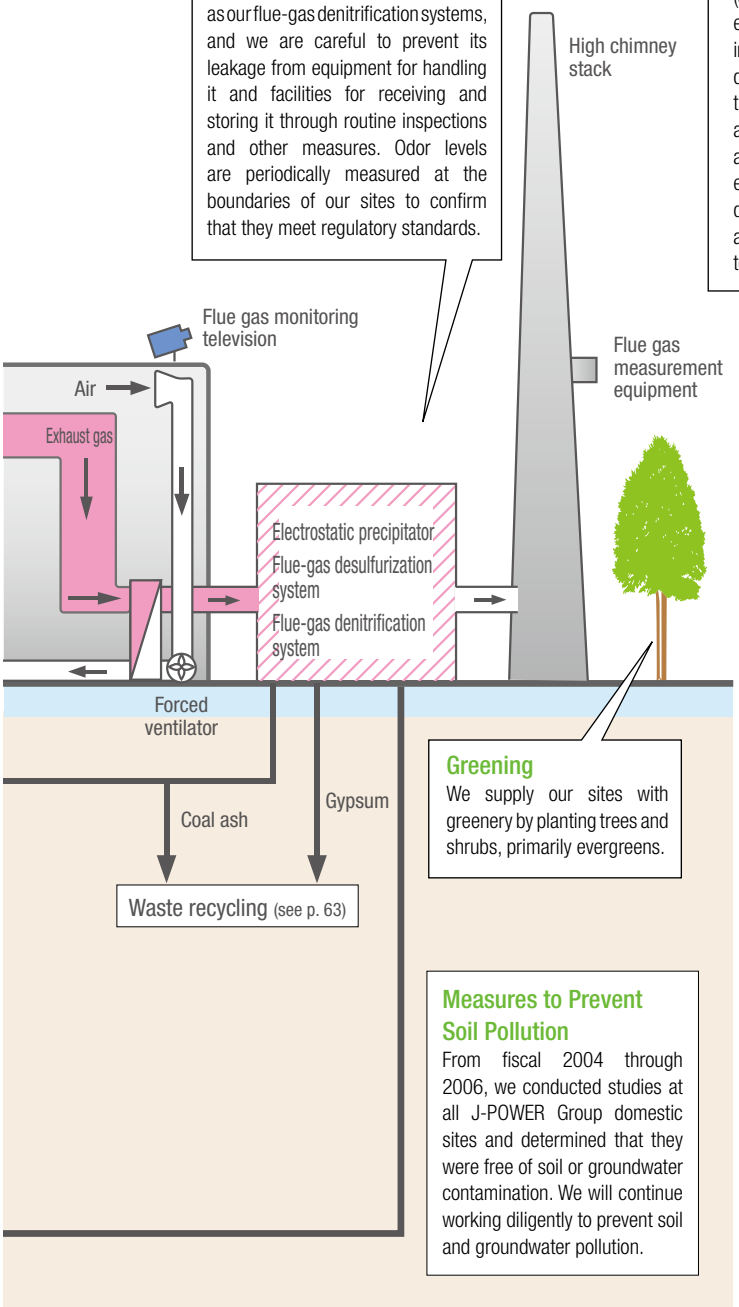
Industrial water is used in such equipment as boilers, cooling systems, and wet-type desulfurization systems, and almost all of it is released into the atmosphere as steam. We are working to reduce our consumption of industrial water through the recovery and reuse of rainwater and waste water that is not released into the atmosphere.

Odor Control

Ammonia is used in such equipment as our flue-gas denitrification systems, and we are careful to prevent its leakage from equipment for handling it and facilities for receiving and storing it through routine inspections and other measures. Odor levels are periodically measured at the boundaries of our sites to confirm that they meet regulatory standards.

Air Pollution Control

Combustion of coal and other fuels can generate sulfur oxides (SOx), nitrogen oxides (NOx), and soot and dust. To reduce these emissions we have improved our combustion methods and installed such flue-gas treatment equipment as desulfurization and denitrification systems and electrostatic precipitators. Although the performance of equipment varies with its date of installation, at each facility we have installed the newest technology available at the time to remove pollutants with maximum efficiency. This equipment operates automatically with the aid of monitoring devices that continuously measure the content of flue gas. In addition, human operators monitor the equipment 24 hours a day to ensure a swift response in the event of any malfunction.



Greening

We supply our sites with greenery by planting trees and shrubs, primarily evergreens.

Measures to Prevent Soil Pollution

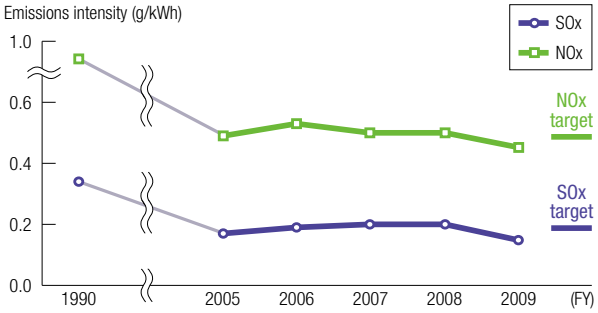
From fiscal 2004 through 2006, we conducted studies at all J-POWER Group domestic sites and determined that they were free of soil or groundwater contamination. We will continue working diligently to prevent soil and groundwater pollution.

● Flue-gas Emissions, FY 2009

Substance	Equipment efficiency (removal efficiency)	Emissions	Emissions intensity
SOx	64%–99%	8,100 tons	0.16 g/kWh
NOx	69%–94%	22,300 tons	0.44 g/kWh
Soot and dust	99% (as designed)	600 tons	0.01 g/kWh

Notes:
1. Emissions intensity: Emissions per unit of electricity generated at thermal power stations.
2. Emissions of soot and dust are calculated on the basis of measurements taken monthly.

● J-POWER Group SOx and NOx Emissions Intensity



Note: Figures for 1990–2004 are for J-POWER only.

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Dry-type Flue-gas Desulfurization-Denitrification System (Regenerative Activated Coke Technology: ReACT)

The ReACT dry-type desulfurization and denitrification system continuously regenerates and recycles activated coke, removing such pollutants as SOx, NOx, and soot and dust from flue gas. Another key feature is that it uses almost no water. J-POWER has been using this system at two of its large-scale commercial plants, the Takehara Thermal Power Station No. 2 unit and the Isogo Thermal Power Station new No. 1 unit. In addition, J-POWER Group company J-POWER EnTech, Inc., which specializes in Re- ACT engineering, has been supplying ReACT systems for power stations, steel mills, and other industrial facilities in Japan and abroad, including J-POWER's Isogo Thermal Power Station new No. 2 unit. By using this technology in our own power stations and making it available to other companies and industries as well, we are helping reduce the environmental load across a broad economic spectrum (see also p. 80).

Dry-type desulfurization system at Isogo Thermal Power Station new No. 2 unit (Yokohama)

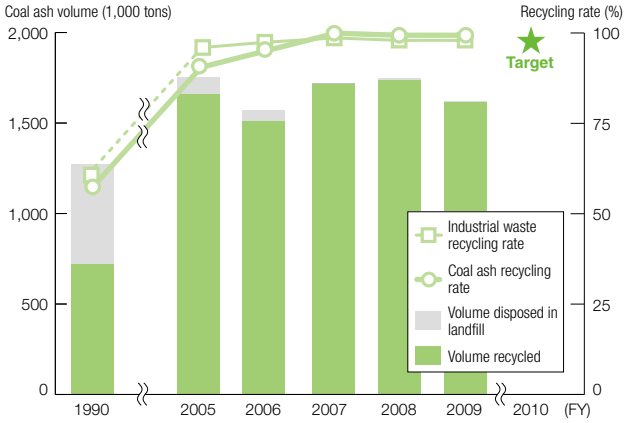
Establishing a Sound Material-Cycle Society

To help establish a sound material-cycle society, the J-POWER Group is working hard to reduce the waste we generate and to properly treat and recycle the waste we do produce. We are also pursuing business undertakings that build on these practices.

Recycling and Reduction of Waste

In fiscal 2009, the J-POWER Group generated 2.00 million tons of industrial waste, while recycling or reusing resources totaling 1.96 million tons, or 98 percent. In the J-POWER Group, we intend to promote more extensive recycling of coal ash and reduction of industrial waste generated from the maintenance and operation of power stations to "achieve a recycling rate of 97 percent within the J-POWER Group as a whole by the end of fiscal 2010, with the goal of zero emissions*1 of industrial waste" (see p. 41).

● Industrial Waste and Coal Ash Recycling Rates



Note: The figure for fiscal 1990 represents J-POWER's recycling rate for coal ash only; figures from fiscal 2005 onwards and target figures represent the effective recycling rate for all industrial waste produced by all companies of the J-POWER Group.

■ Beneficial Use of Coal Ash and Gypsum

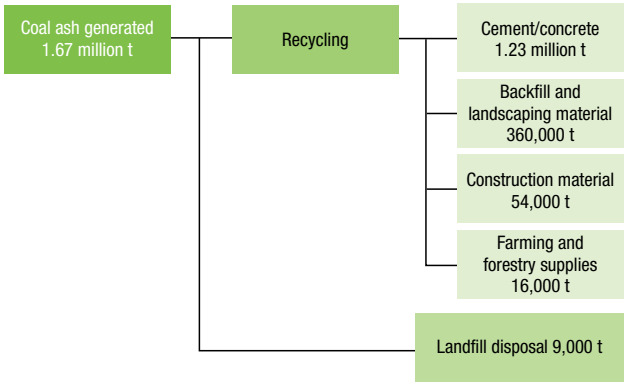
Almost all the coal ash generated by coal-fired power stations is recycled, either as construction material such as a clay substitute in cement and backfill and landscaping material or farming and forestry supplies such as fertilizers. All of the gypsum and sulfuric acid generated by our flue-gas desulfurization systems is recycled.

● Examples of coal ash recycling

Park turf planted using "J-SAND" (clinker ash*2)

Dam built with "J-POWDER" (fly ash*3) as concrete admixture

● Breakdown of Coal-Ash Recycling



COLUMN

EPO-COAL: Activated Coke Powder for Dioxin Removal

The J-POWER Group's powdered dioxin remover EPO-COAL for waste incinerators is a commercial product made from activated coke powder discharged from the dry-type flue gas dentrification units of coal-fired power stations. It is highly regarded by users and equipment manufacturers for its stability of performance, quality and price.

The purpose of the J-POWER Group's involvement in this business is not only to reduce waste and raise our recycling rate but also to contribute to the creation of a material-cycle society. We also regard it as integral to our efforts to stem global warming, since recycling can reduce the CO_2 emissions that result from production of the activated coke commonly available on the market. As a member of a society that is striving for harmonious coexistence with the environment, we plan to pursue such operations actively.

Activated coke pellets

Thermal power station dry-type flue-gas treatment system (recycling)

Powdered by machine and chemical action

EPO-COAL (activated coke powder)

References

*1 Zero emissions
An initiative advocated by United Nations University to build a system of waste recycling through inter-industry partnerships and reduce the amount of waste (final disposal volume) to a level approaching zero.

*2 Clinker ash
Sandlike substance formed when dissolved ash congeals and collected at the bottom of boilers. Used as soil and ground conditioner, backfill material, etc.

*3 Fly ash
A granular ash created by the combustion of coal in boilers and collected in electrostatic precipitators. Used as concrete admixture.

Recycling of Construction By-products

We work with subcontractors and others to promote efficient use of by-products generated by new construction, expansion, and renovation of electric power facilities, as by recycling concrete scrap and cleared timber or making use of loose earth generated during construction within the grounds of the facility.

Beneficial Use of Driftwood

In the J-POWER Group, we are working to effectively recycle the driftwood that flows into the dam reservoirs at our hydropower stations.

Our initiatives include chipping the driftwood for use as mulch or boiler fuel, and using it to manufacture charcoal or extract pyroligneous acid.

Chips used as ground cover at Ikehara Dam Park (Nara Prefecture)

Chips

Reducing and Recycling Office Waste

All J-POWER Group offices are working to reduce nonindustrial waste by such measures as sorting waste paper, bottles, cans, and plastics; using both sides of copier paper; and reusing envelopes.

In respect to our paper recycling rate, our employees are working harder than ever to help us reach our group-wide corporate target (see p. 41).

Promoting Green Purchasing

To contribute to the development of a material-cycle society, we have adopted the J-POWER Group Green Purchasing Guidelines to promote green purchasing throughout the J-POWER Group.

These guidelines apply not only to office supplies but to all products and services purchased by members of the J-POWER Group. We are pursuing a wide-ranging policy that encourages environmental responsibility among our suppliers and subcontractors, as by stipulating specifications that must be built into construction and other contracts to ensure that subcontractors carry out the work in an environmentally friendly manner.

In addition, we are promoting green purchasing on an ongoing basis by establishing Group-wide corporate targets (see p. 41) for the rate of green purchasing of office supplies (desk supplies) and the ratio of recycled copy paper to the total purchased, as well as the percentage of low-emission vehicles among Group company vehicles.

http://www.jpower.co.jp/company_info/environment/kankyo04gl.html (Japanese only)

Voice

Protecting Churashima (the "beautiful islands") by Sorting Our Garbage!

Chieko Ooshiro
Ishikawa Office
JP Business Service Corporation

The Okinawa Yanbaru Seawater Pumped Storage Power Station, on the Pacific side of northern Okinawa, is located in a rich natural environment. A number of unique indigenous species of plants and animals are found here, including the Okinawa rail and the Castanopsis sieboldii tree.

The facility is the world's only seawater pumped storage power station, and for this reason attracts more than 5,000 visitors per year, including ordinary citizens, students, and even overseas visitors. We guide visitors around the plant, and we also work to beautify the grounds to ensure that our visitors have a pleasant experience.

Located deep in the mountains in Kunigami Village, the power station has no garbage collection service, and so we have to transport our garbage to the collection site in Higashi Village, four kilometers away. We are attempting to increase awareness that garbage sorting is something that each individual should be doing, and in this context we are also making an active social contribution, for example by donating PET bottle caps and ring pulls from cans to volunteer organizations.

When you come to Okinawa, please be sure to visit our facility.

Environmental and Recycling Programs

The J-POWER Group is involved in a variety of environmental and recycling programs pertaining to such matters as proper waste treatment, environmental conservation, and use of untapped energy sources.

Demonstration Trials of Carbonized Fuel using Non-industrial Waste as Raw Material

The J-POWER Group has been working to develop technology for the production of carbonized fuel from non-industrial waste with biomass content. The project was conducted from fiscal 2004 to fiscal 2009 in collaboration with the city of Saikai in Nagasaki Prefecture as a New Energy and Industrial Technology Organization (NEDO) Verification Test for Biomass and Other Untapped Energy. We conducted demonstration trials, and were successful in developing a technology for the manufacture of carbonized fuel able to be co-combusted with coal in thermal power stations. We are now working towards the realization of full-fledged manufacture of carbonized fuel.

Test facilities for production of carbonized fuel from non-industrial waste
Matsushima Thermal Power Station (Nagasaki Prefecture)

Omuta Recycle Power Station

Since December 2002 the J-POWER Group has been operating a high-efficiency waste-power station in Omuta, Fukuoka Prefecture, that uses refuse-derived fuel (RDF) made by shredding, drying, and pelletizing non-industrial waste.

Omuta Recycle Power Station (Fukuoka Prefecture)

Narumi Waste Gasification Plant, Nagoya

The J-POWER Group is also participating in a project involving gasification power generation*1 using non-industrial waste. At the Narumi Waste Gasification Plant in Nagoya, waste is not only used to generate power, but also reduced to molten slags and metals that can be recycled. The facility began operating in July 2009.

Narumi Waste Gasification Plant (Nagoya)

COLUMN

Dioxin Monitor

The first generation of J-POWER's dioxin monitor (coulometric titration method), a by-product of our development of technology for power generation using non-industrial waste, is being used in a variety of applications, including by municipalities and private enterprises to monitor incinerators. We continued to further advance our monitoring technology and have now produced a next-generation high-performance model (plasma method) in collaboration with a manufacturer of analytic equipment. The new model is undergoing demonstration trials in a waste power plant. This technology is designed to be used in a wide range of applications including plant monitoring and management, and to support stable, long-term plant operation. We are hopeful that it will enhance the safety and peace of mind of local residents while contributing to the development of a material-cycle society.

Plasma-method monitor for demonstration trials

References

*1 Gasification power generation
Power generation technology that uses high-temperature processing to melt down such waste matter as burnable refuse, combustion ash, and shredded solid waste into recyclable slag. The pyrolysis gas generated by the gasification-melting furnace is directed to a boiler for heat recovery and used to power an electric generator. The electric power thus generated is used to operate the facility, and surplus power is sold.

Management of Chemical Substances

Storage and management of chemical substances in the J-POWER Group is rigorous and in full compliance with the law. With regard to PCBs, we are following detoxification treatment procedures in conformance with Japan's regional waste treatment program.

PRTR (Pollutant Release and Transfer Register)

The PRTR system is a mechanism for reporting and disclosing the level of chemical emissions and the transfer of chemicals to the environment through waste materials. The legislation was enacted in 1999, and monitoring and reporting of the targeted substances began in 2001.

While the J-POWER Group uses chemical substances for painting and coating, treatment of intake water at thermal power stations, and other purposes, we have traditionally managed these substances carefully by monitoring and recording the quantities purchased and used. We are committed to reducing the use of such chemicals and to controlling and managing those we use appropriately, complying with all established procedures. With respect to dioxins, we are working hard to reduce emissions through proper management and oversight of facilities.

● PRTR Substance Release and Transfer Volumes (FY 2009)

Substance	Use	Volume handled	Volume released	Volume transferred as waste
63: Xylene	Coating for machinery	6.37 t/y	3,287 kg/y	—
40: Ethylbenzene	Coating for machinery	1.15 t/y	1,145 kg/y	—
177: Styrene	Coating for machinery	3.84 t/y	2,311 kg/y	—
26: Asbestos	Insulation material	1.48 t/y	—	5,696 kg/y
179: Dioxins	Waste incinerators	—	0.0 mg-TEQ/y	7.3 mg-TEQ/y
304: Boron and its compounds	Fertilizer additive	8.44 t/y	0.2 kg/y	—

Notes:
1. Figures represent total release and transfer volumes for all business sites handling 1 ton or more per year of a Class 1 designated chemical substance or 0.5 ton or more per year of a Specific Class 1 designated chemical substance.
2. For dioxins, figures represent total emissions from waste incinerators.

Measures to Reduce Dioxins

The J-POWER Group operates incinerators (designated as "specified facilities" under the Act on Special Measures against Dioxins) at three business sites. At these specified facilities we follow appropriate maintenance and management procedures, such as sorting prior to treatment and combustion temperature control. In compliance with the above-mentioned act, the dioxin concentration in the flue gas of these facilities is measured at least once a year and reported to the local government, and in fiscal 2009, all of them met emissions standards.

Asbestos

The J-POWER Group has adopted an asbestos policy, under which we have conducted health checks and surveys of asbestos use in our equipment and buildings and undertaken appropriate countermeasures.

Where we have confirmed the presence of asbestos, we are systematically removing it and switching to alternatives while effectively managing the process to prevent dispersal of asbestos dust. Asbestos-containing material that has been removed is disposed of in a manner consistent with the Waste Management and Public Cleansing Act.

PCB Waste

■ Management and Treatment of PCBs

PCBs have been widely used for insulating oil in transformers and other electric devices because of their excellent heat-resistance and insulation properties. Because of their toxicity, however, manufacture and import were outlawed in 1974, and all those in possession of such substances were required to observe stringent storage and management requirements. In July 2001, the Act on Special Measures against PCB Waste came into force, and proper treatment of waste containing PCBs became mandatory.

The J-POWER Group began treatment of these substances under the regional waste treatment program in February 2005, and as of March 2010 we had treated approximately 15 kl of insulating oil (containing high concentrations of PCBs). The J- POWER Group currently has approximately 124 kl of insulating oil (as of March 2010). This is stored and managed under stringent conditions in 31 warehouses and similar facilities that we have established nationwide.

■ Trace PCB Contamination

Concerns have been raised by the detection of extremely low levels of PCBs in heavy electrical machinery that would not ordinarily contain PCBs. In the J-POWER Group, we are conducting analyses as needed, following stringent management procedures for machinery using insulating oil in which traces of PCBs have been detected, and submitting all paperwork required by the relevant laws and regulations. We will continue to respond to this issue in a conscientious and appropriate manner.

Part 4

Ensuring Transparency and Reliability

The J-POWER Group is working to improve environmental management and ensure legal compliance in all its business activities. By disclosing a wide range of environmental information, we are striving to earn society's trust.

Continual Improvement in Environmental Management

In 2002, the J-POWER Group completed the process of putting in place environmental management systems (EMS) at all of our business sites to guide the implementation of environmental initiatives based on our corporate philosophy. By the end of 2005, all of J-POWER's power generation, transmission, substation, and communication facilities had obtained ISO 14001[*1] certification. By the end of fiscal 2007, every one of our consolidated subsidiaries at the time had an EMS in place. Henceforth, we will strive for continual improvement in our environmental management. We are also aiming towards the introduction of EMS in all our consolidated subsidiaries from fiscal 2008 onwards, and some of the companies which do not yet have one are presently conducting reviews towards introduction.

Administration of Environmental Management

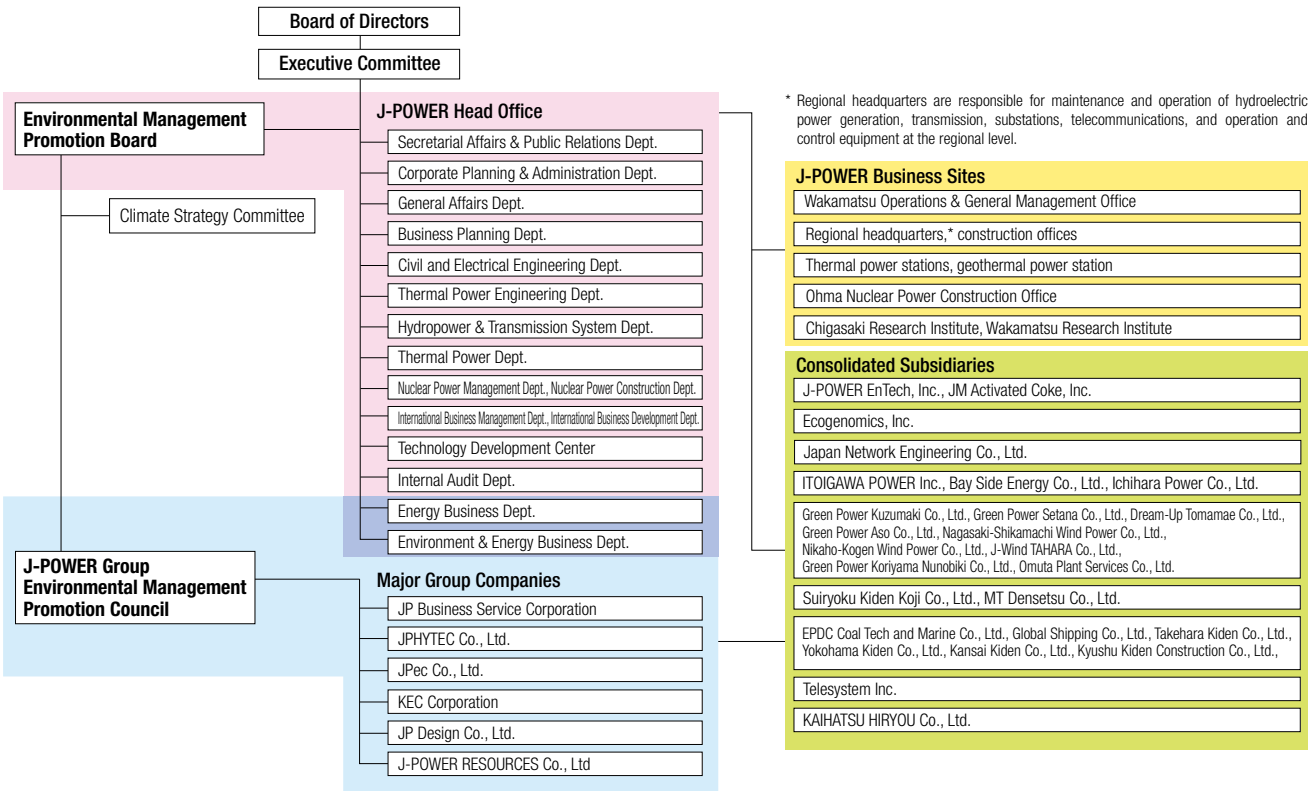
The Environmental Management Promotion Board was established to discuss, coordinate, and report on overall environmental management in the J-POWER Group. It is led by a J-POWER executive director in charge of environment and made up of relevant executives and division heads.

The J-POWER Group Environmental Management Promotion Council was established as a subgroup of the Board to encourage cooperation and coordination throughout the group. On the basis of the J-POWER Group Environmental Action Guidelines (see p. 76), reviewed annually by management, each J-POWER Group company or business site draws up its own Environmental Action Plan. They periodically review and evaluate their initiatives and revise the measures to be taken, following the PDCA cycle.[*2]

J-POWER Group companies that maintain electric power facilities have received ISO 14001 certification for all business sites involved in their operation or maintenance (thermal power stations, geothermal power stations, regional headquarters, etc.; see p. 79). All other J-POWER Group companies follow EMSs tailored to their own business activities, which they are working continuously to improve.

EMS internal audit (J-POWER head office)

● J-POWER Group Environmental Management Organization Chart (as of March 2010)



References

*1 ISO 14001
Part of the ISO 14000 series of international standards for environmental management adopted by the International Standards Organization (ISO), ISO 14001 specifies the requirements for an environmental management system.

*2 PDCA cycle
Management cycle, consisting of plan, do, check, and act, whose repetition provides the basis for continual improvement in environmental management systems.

Education and Training

The J-POWER Group carries out various in-house and external environmental training programs to raise employee awareness and cultivate a sense of personal responsibility regarding environmental issues.

In fiscal 2009 we implemented a variety of training programs aimed at promoting a better understanding of environmental statutes to ensure full compliance.

● In-House Environmental Training, Fiscal 2009

Level	Category	Course/activity	Participation	Coverage of environmental statutes, compliance, etc.
General	Environmental management (general)	Environmental briefings, various lecture presentations on the environment	1,100 participants	J-POWER Group's efforts
	E-learning	The J-POWER Group Sustainability Report (Environment)	82%	Overview of Sustainability Report
		Environmental law training	82%	Introduction to the Waste Management and Public Cleansing Act, Act on the Prevention of Marine Pollution and Maritime Disasters, PCB Special Measures Law
Technical	EMS implementation	Internal environmental auditor training	52 trainees	Requirements of ISO 14001, internal environmental audit methods
		Follow-up training for internal environmental auditors	24 trainees	Practice in identifying noncompliance, etc.
	Environmental laws and regulations	Waste management skills upgrade	409 trainees	Understanding of the Waste Management Law, application of guidelines for selecting contractors, etc.
		Waste management risk assessment	6 sites	Verification of legal requirements for contracts, manifestos, etc.
		Environmental law courses by level	374 trainees	Explanation of environmental statutes, etc.
	E-learning	EMS course (advanced)	(Continuing implementation)	Requirements of ISO 14001, audit methods, etc.

COLUMN

Training in Environmental Laws at JPec Co., Ltd.

Even though we might have studied environmental laws, a considerable amount of knowledge is required to understand just exactly which items of which articles apply directly to the specific work that we do.

We have therefore divided up the large number of laws by their relation to individual work processes and operations, and formulated training materials that are directly relevant to our employees' work roles and that can teach them, in a short period, about the laws that specifically relate to their work procedures.

The work performed by JPec Co., Ltd. covers a wide range of areas, including coal unloading, dock operations, ash disposal, and coal handling. We have summarized information on what type of environmental risks might arise at the worksite, and how to minimize those risks, in a compact form. The information regarding each particular work process can now be absorbed in about 20-30 minutes, and our employees have rated the new training materials "easier to understand."

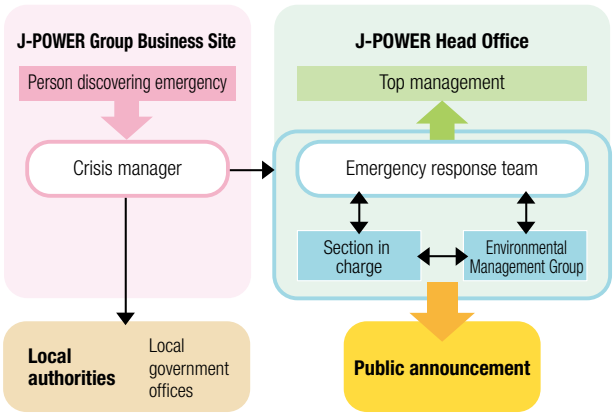
Training at JPec Co., Ltd. Takehara Company

Response in the Event of an Environmental Emergency

In the event of an environmental emergency within the JPOWER Group, the following procedures are to be followed:

1. The official in charge of crisis management at each business site will take the necessary steps to prevent damage from spreading and will contact the relevant local organizations, the Head Office Emergency Response Team, and the head office section in charge of the business site.
2. The Head Office Emergency Response Team will promptly report to top management and provide information on the emergency to the media and other interested parties.

● Response and Information Disclosure in the Event of an Environmental Emergency



Environmental Incidents

In fiscal 2009, no incidents occurred that exceeded the regulation values stipulated by environmental laws or accords, or which were reported by the mass media.

In fiscal 2010, two incidents have occurred that were reported. We are working to prevent recurrences through more rigorous management procedures and other steps. (See table below.)

Location	Situation/response
Nagasaki Shikamachi Wind Farm (Sasebo, Nagasaki Prefecture)	On April 24, 2010, at the Nagasaki Shikamachi Wind Farm in Shikamachi-cho, Sasebo, Nagasaki Prefecture, a malfunction in a lubricating oil purifier caused approximately 20 liters of lubricating oil from one of the 15 turbines to flow around the base of the turbine and also to spray onto an area of grass. We have cleaned up the spilled oil by removing soil and cutting grass, and we are revising our procedural manuals, notifying all employees of the procedural manuals, and training our maintenance personnel in order to prevent a recurrence.
Takehara Thermal Power Station (Takehara, Hiroshima Prefecture)	On May 28, 2010, a connecting flange between a hopper and an air slider in coal-loading equipment opened, and coal leaked and was sprayed out for approximately 10 minutes. We are working to prevent a recurrence by improving the relevant equipment, in addition to retraining the employees responsible for the procedure in environmental protection.

External Evaluation and Outside Opinions

The J-POWER Group strives to incorporate various forms of third-party evaluations and recommendations into its activities, including reviews, Sustainability Report questionnaires, and expert opinions. By means of these evaluations and opinions, we determine the kind of business development and environmental activities that others expect of the J-POWER Group and work to improve our sustainable management. We also enhance our transparency and reliability by making such comments public.

Roundtable Discussion with Distinguished Experts

Harmonizing energy supply with the environment

—Environmental Management in the J-POWER Group from 2010 Onwards—

At present, the J-POWER Group is working vigorously to achieve the corporate targets outlined in our Environmental Management Vision (p. 41-42). However, fiscal 2010 represents the year of completion for the majority of these targets.

Given this, we gathered together experts from outside the company to discuss the type of targets that J-POWER should work towards from fiscal 2011 onwards. Our guests offered wide-ranging opinions and suggestions from a variety of specialized perspectives.

(The Roundtable was held on December 18, 2009)

» Participants

Ryuta Uozumi President and CEO, KPMG AZSA Sustainability Co., Ltd.	**Yuko Sakita** Journalist and environmental counselor	**Mizue Tsukushi** President and CEO, The Good Bankers Co., Ltd.
Gento Mogi Associate Professor, Department of Technology, Management for Innovation, School of Engineering, The University of Tokyo	**Izumi Washitani** Professor, Department of Ecosystem Studies, Graduate School of Agricultural and Life Sciences, The University of Tokyo	**Kuniharu Takemata** Executive Director, Vice-Chairperson, Environmental Management Promotion Board, J-POWER

Ryuta Uozumi
President and CEO, KPMG AZSA Sustainability Co., Ltd.

Make a global contribution by providing new technologies for coal-fired generation

"Sustainability" is a word we hear in relation to the global environment, but to create a sustainable society, we also need sustainable companies. Companies possess core skills that can make a contribution to society, and if they can provide technologies to the world, they will be able to contribute to the creation of a sustainable society. For example, because technologies that increase the efficiency of energy use reduce costs and also reduce CO_2 considered on an emission intensity*1 basis, I believe it to be best that we consider the sustainability of the global environment at the company level.

Looking towards 2030 and 2050, energy demand will continue to increase in China and India, and it is predicted that there will be a shift towards coal-fired generation, with its excellent cost-performance, to supply the necessary power. However, CO_2 emissions per unit of power generated are high for coal-fired generation, and for this reason countries around the world are engaged in the development of CO_2 separation, capture, and underground storage (CCS) technologies. Against this background, the J-POWER Group's high-efficiency coal-fired generation technologies and CCS technologies are highly regarded around the globe, and I feel that the provision of these technologies to the world should form the basis of the strategy with which you proceed. (I believe that whether or not CCS goes into actual use will be determined by the comparison between its cost and compliance costs).

With regard to the corporate targets for your Environmental Management Vision, I think that they will be further improved if you indicate goals and ultimate targets. Given that the 10th meeting of the Conference of the Parties to the Convention on Biological Diversity (COP10) will be held in Nagoya in the fall of this year, you might also consider setting targets in relation to biological diversity.

*1 Emission intensity
CO_2 emission intensity. CO_2 emissions per unit of electricity sold.

Formulate energy plans suited to regions

Yuko Sakita
Journalist and environmental counselor

The reduction of CO_2 emissions is tremendously important as a measure against global warming. The reduction of CO_2 emissions in energy supply is a particularly important area of focus, and for this reason I believe that the J-POWER Group's concept of "Harmonizing energy supply with the environment" represents an extremely valuable perspective.

Sustainability Report 2009 considered the "Safe, Sustainable Use of Nuclear Energy." I think it is highly commendable that you stated honestly that you take multiple safety measures into consideration in the case of nuclear power stations, due to the fact that "radioactive materials are being handled," and that "machines can fail." I felt that it would have been even better had you indicated the J-POWER Group's thinking on nuclear energy after you had discussed the balance in your energy structure of sources that produce no CO_2, including renewable energy sources, and clarified your future energy strategy in its entirety.

In a period of economic downturn like the present, we tend to feel that it is difficult to invest in the environment. However, it is precisely periods such as this when such investment is necessary. This is a period of change in which industry, consumers, and the administration together can turn the economy around with the environment as the axis. For this reason, I think that coal-fired facilities should be replaced as much as possible with high-efficiency facilities.

In addition, there is an increasingly active movement in regional communities towards the idea of achieving energy independence and revitalizing regional areas by making intensive use of previously untapped resources. The use of woody biomass and bamboo in particular would bring Japan's mountain regions back to life and would play a part in revitalizing the nation's industries, beginning with agriculture and fisheries. I look forward to proposals by the J-POWER Group that take into consideration a variety of energy plans for regional areas, including the use of sewage sludge.

Make technology a service and foster personnel to sell that service

Mizue Tsukushi
President and CEO,
The Good Bankers Co., Ltd.

Many data companies that collect information using artificial intelligence, as well as those that screen socially responsible investments (SRI), are presently being acquired by Bloomberg*1 and Thomson Reuters*2. This indicates that a company's environment/society/governance (ESG) performance is regarded as a main factor in their assessment. In the future, companies will need a strategic approach to ESG, from the perspective of indicating exactly on what they place value.

For a long period, Japan's environmental technologies have been regarded as the best in the world, but recently China and Korea are catching up to or even overtaking us. Just considered from the perspective of population, China has ten times the amount of people required to surpass Japan's level, and I believe that there is an extremely strong possibility that the nation will make breakthroughs in any number of fields in the future.

Considering this situation, I have been suggesting that the J-POWER Group should market its expertise in the operation of high-efficiency coal-fired power station technologies in India and China. While manufacturers may possess technologies, it is rather rare that they leverage those technologies to provide services. In the future, it will be important for the J-POWER Group, holding a position as industry leader, to develop high-efficiency coal-fired generation technologies, in addition to fostering human resources able to sell those technologies in the form of expertise, as well as human resources capable of operating those technologies. It is likely in future that the boundary between energy companies and resources companies will disappear. It is my belief that, having ensured that you are ahead of the trends of your overseas competitors, emphasizing the fact that you are a highly competitive company will represent an advantage from the perspective of investor relations (IR).

*1 Bloomberg
A US company that offers comprehensive information services, providing economic and financial information and operating communications and broadcasting businesses.

*2 Thomson Reuters
A major international information provider based in the US.

Gento Mogi
Associate Professor, Department of Technology, Management for Innovation, School of Engineering, The University of Tokyo

Balance the pursuit of profit with contribution to society via the environment

Because environmental problems are global problems, it is important that we aim for the overall optimum rather than focusing on achievement of the optimal in individual companies. The use of coal to produce electricity should be encouraged from the perspective of efficient use of energy resources; saying that coal use is bad for the environment is arguing from the wrong direction. Converting coal into electricity and using it effectively is an important mission for J-POWER, and the use of technology to increase the efficiency of this conversion is essential from the perspective of the environment and the efficient use of fossil fuels.

Looking at carbon capture and storage (CCS), its most rational use is for EOR*1 in oil fields, and I believe that it is a technology that should be used in oil fields in the Middle East and China. In the future, this technology might be sold to China, or used to obtain credits via CDM. CO_2 emissions must be reduced on a global level rather than by Japan alone, and you should by all means make use of CDM, the most promising means of realizing this.

With regard to nuclear power, I would first like you to consider a sustainable system. If we use nuclear fuels in a once-through cycle, then uranium is a vanishing resource, and we have only enough for about 60 years. It is therefore desirable that we consider how to realize the nuclear fuel cycle*2 more rapidly.

Finally, it is in the nature of a company to seek profits, but a company that places a burden on the environment as a result of this profit-seeking cannot be called a sustainable one. The desirable situation is one in which the company naturally makes a contribution to society via the environment as a result of pursuing profits. I would like to see the J-POWER Group develop mechanisms that make this possible.

*1 EOR
Enhanced oil recovery. Methods of extracting the remaining oil reserves from fields on which wells have ceased to flow or in which the water content of the oil stratum has increased.

*2 Nuclear fuel cycle
The efficient reuse of uranium resources by separating, recovering, and reusing useful substances such as plutonium from spent fuel.

Izumi Washitani
Professor, Department of Ecosystem Studies, Graduate School of Agricultural and Life Sciences, The University of Tokyo

Develop power sources suited to the ways in which cities should be developed as well as to population trends

I am extremely concerned by the fact that when a large power station is built, the natural environment and biological diversity may be sacrificed. Numerous plans also exist for wind power development, and I think that it will be important for us to conduct strategic assessments at the planning stage with a clear focus on the position of wind power in the Japanese environment.

Both in Japan and around the world, populations are tending to concentrate in cities, and it will be essential for us to understand how this affects demand for electricity. Tokyo is a mega-metropolis, huge even by world standards, but it is at the top of the class as far as CO_2 emissions are concerned. Tokyo's population is ten times that of San Diego in the US, but it emits less CO_2. It will be difficult to stop the further growth of cities in the future, but I believe that by considering the best direction for urban development, we will be able to control CO_2 emissions to a significantly lower level.

If the amount of human movement declines with the future aging of the population, it is possible that the volume of energy use will also decline. Precisely at present, it is important that we attempt to develop ways of living that are comfortable and yet do not produce a burden in the form of CO_2.

Excess generation capacity tends to be necessary because of peaks in electricity demand. If we were able to use electricity in such a way that no peaks occurred, we could reduce the burden on the environment. The Japanese Smart Grid design will be essential in realizing this goal.

Response to the discussions

The most important environmental management issues for the J-POWER Group are, first, measures against CO_2, and, second, measures to deal with waste products, chiefly coal ash.

With regard to measures against CO_2, we will contribute to a reduction in CO_2 emissions on a global scale by transferring the world's most advanced high-efficiency coal-fired generation technologies overseas. Looking at waste products, in future we will continue to make efforts to achieve efficient use, and we will work to maintain the present target level.

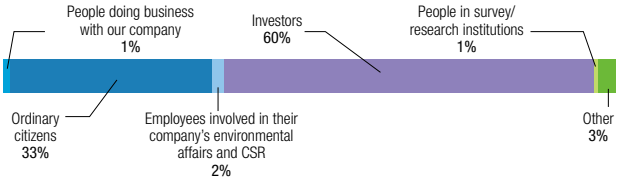
Giving consideration to the opinions of the participants in today's roundtable, we will seek to increase awareness of energy, our region, and the environment within the J-POWER Group, and we will steadily implement each of the initiatives that we adopt.

Kuniharu Takemata
Executive Director, Vice-Chairperson, Environmental Management Promotion Board, J-POWER

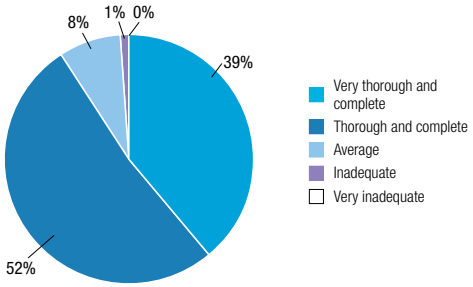
Readers' Opinions

We received many comments from readers in response to the *J-POWER Group Sustainability Report 2009* (published July 2009) (391 respondents). We consider these valuable comments to be important guidelines for compiling subsequent reports and for the future initiatives of the J-POWER Group, and intend to put their lessons to use in our corporate activities.

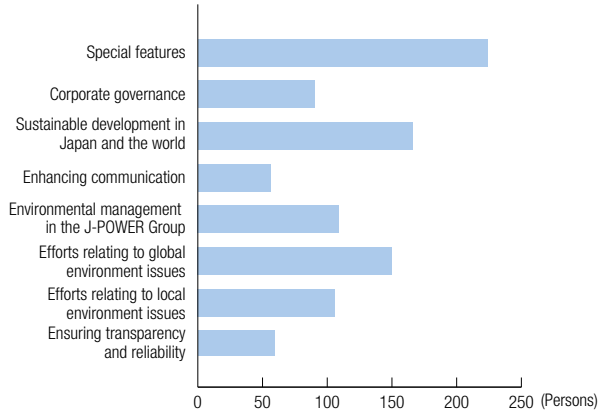
● Breakdown of survey respondents



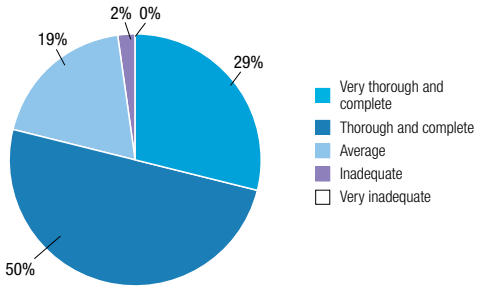
● Quantity and Quality of Information in the Report



● Items of particular interest (multiple answers)



● Design and layout of report



● Expectations for the J-POWER Group

Typical comments	Our response
I hope that you will push ahead and finally succeed in the development of carbon capture and storage (CCS) technologies for coal use. If this technology goes into use, we will make significant progress on the problem of global warming.	CCS technologies are technologies for the separation and capture of CO_2 from large-scale emission sources such as coal-fired power stations, and its stable storage deep underground. We consider them to be promising technologies in the fight against global warming, and we are pursuing a variety of related technological developments. [For further information, please see "Establishment of Osaki CoolGen Corporation" and "A Variety of Initiatives in the Area of Technologies related to CO_2 Capture and Storage (CCS)" on page 54 in the Environmental section of this report.]
For the sake of the global environment, I would like to see progress in the use of woody biomass and waste products such as sewage sludge as fuel.	Seeking to reduce CO_2 emissions, we are working to make effective use of biomass, for example by co-combusting biomass such as sewage sludge and logging remnants from Japanese forests in coal-fired power stations. [For further information, please see "Beneficial Use of Biomass" on pages 51-52 of the Environmental section of this report.]
Further responses to environmental problems seem to be necessary, and I am looking to J-POWER for sophisticated initiatives. I am also impressed by your company's responses to the issue of biological diversity.	When the J-POWER Group constructs a new power station, we conduct an environmental assessment, and give appropriate consideration to the protection of the environment while reflecting the opinions of the residents of the region and others. In addition, we engage in careful monitoring while implementing environmental protection measures that will see our activities harmonize with nature. In going about our business activities, we take biological diversity into consideration, and we work to function in harmony with the natural environment.
I want to see J-POWER really working to put into action all the items covered by the Sustainability Report.	We will continue to conduct environmental management, based on our corporate philosophy – "to ensure constant supplies of energy to contribute to the sustainable development of Japan and the rest of the world" – and taking into consideration the opinions of all our stakeholders.

Other comments and our responses can be viewed on our website. http://www.jpower.co.jp (Japanese only)

The Accuracy of This Report

To ensure the accuracy and comprehensiveness of important environmental and societal data as well as performance indicators (hereinafter "sustainability information") contained in the *J-POWER Group Sustainability Report 2010*, the sustainability information herein has been independently reviewed and certified by Ernst & Young ShinNihon Sustainability Institute Co., Ltd. in accord with the sustainability report review and registration system of the Japanese Association of Assurance Organizations for Sustainability Information (J-SUS). As a result of this review, an "Independent Assurance Report" has been received.

The J-SUS mark on the back cover indicates that the sustainability information contained in this report fulfills the reliability criteria established by the Association for its sustainability report review and registration system.

Document review (J-POWER head office)

Site inspection (Isogo Thermal Power Station, Yokohama)

Translation

The following is an English translation of an independent assurance report prepared in Japanese and is for information and reference purposes only. In the event of a discrepancy between the Japanese and English versions, the Japanese version will prevail.

Independent assurance report

6 July 2010

Mr. Masayoshi Kitamura
President
Electric Power Development Co.,Ltd

1. Purpose and scope of our assurance engagement

We have performed certain assurance procedures, based on the engagement with Electric Power Development Co.,Ltd (the "Company"), on the Company's key sustainability performance indicators. These comprise the material sustainability information[1] of the Company and its major subsidiaries for the year ended 31 March 2010, that were reported in "J-POWER Group Sustainability Report 2010 (the "Report"). The assurance procedures are with respect to whether the key sustainability performance indicators have been measured and calculated accurately and whether material information has been fully disclosed in accordance with the reporting standards for sustainability reports[2].

The preparation of the Report is the responsibility of the Company's management. Our responsibility is to express an independent opinion on the Key Sustainability Performance Indicators.

2. Outline of the assurance procedures performed

We have performed limited assurance procedures[3] in accordance with the 2003 International Standard on Assurance Engagements (ISAE) 3000: Assurance Engagements other than Audits or Reviews of Historical Financial Information of the International Federation of Accountants (IFAC) and the 2008 Practical Guidelines for the Assurance of Sustainability Information of the J-SUS. Therefore, our assurance engagement provides relatively limited assurance compared to a reasonable assurance engagement.

3. Conclusion

Based on the assurance procedures performed, nothing has come to our attention that causes us to believe that the Key Sustainability Performance Indicators have not been measured and calculated accurately in accordance with the reporting standards of sustainability reports, or material information has not been disclosed in accordance with the 2009 Sustainability Reporting Assurance and Registration Criteria, in all material respects.

4. Independence

Our assurance is compliant with the Ethics Regulations of J-SUS and there is no financial interest between the Company and us.

Akihiro Nakagome
Representative Director
Ernst & Young ShinNihon Sustainability Institute Co., Ltd.

[1] The scope of material sustainability information is stipulated in the 2009 Sustainability Reporting Assurance and Registration Criteria of the Japanese Association of Assurance Organizations for Sustainability Information (J-SUS).

[2] The reporting standards refer to the 2007 Environmental Reporting Guidelines of Japan's Ministry of the Environment, the 2006 Sustainability Reporting Guidelines of the Global Reporting Initiative, and the 2009 Sustainability Reporting Assurance and Registration Criteria of J-SUS in the context of specifying the material subject to disclosure.

[3] We have mainly reviewed and assessed the Company's procedures for the collection and aggregation of data, performed analytical procedures, as well as recalculated and reconciled them with the corroborating evidence on the quantitative sustainability information on a test basis. In addition, we have mainly made inquiries and reviewed related records to verify the qualitative information.

Independent third-party certification of *J-POWER Group Sustainability Report 2010*

Acquisition of Eco-Leaf Certification

J-POWER's product, electrical power, is certified and registered as "wholesale electricity" under the Eco-Leaf environmental labeling program managed by the Japan Environmental Management Association for Industry (JEMAI). This information is available on the association's website.

ISO 14025 defines three types of environmental labels: I, II, and III. Eco-Leaf is a Type III label, which means the product's environmental load has been quantitatively calculated for every stage of its lifecycle – manufacture, use, and disposal – using the lifecycle assessment (LCA) approach, and this fact has been independently verified.

Information on the Eco-Leaf label can be found on the Japan Environmental Management Association for Industry's website.

Japan Environmental Management Association for Industry
http://www.jemai.or.jp/english/ecoleaf/index.cfm

Tadami Main Transmission Line (Gunma Prefecture)

Reference Data

Compliance Code

I. Basics
(1) Compliance with laws and internal regulations
(2) Acting in accordance with social norms

II. Areas for Compliance

1. Relations with Society
(1) Contribution to society
(2) Compliance with laws and ethical requirements; respect for cultures and customs
(3) Proper information disclosure
(4) Appropriate PR activities
(5) Regulation of donations and contributions to political parties
(6) Terminating relations with anti-social elements
(7) Environmental conservation
(8) Appropriate use of information systems
(9) Protection of intellectual property rights
(10) Compliance with import/export laws and regulations

2. Relations with Customers, Suppliers, and Competitors
(1) Security and reliability of energy supply and products sales
(2) Compliance with the Antimonopoly Law
(3) Dealing fairly with suppliers
(4) Preventing unfair competition
(5) Entertainment/gifts

3. Relations with Shareholders and Investors
(1) Disclosure of business information
(2) Prohibition of insider trading

4. Relations with Government Agencies/ Officials
(1) Adherence to approval and notification procedures
(2) Entertaining/giving gifts to government officials

5. Relations with Employees
(1) Respect for human rights; prohibition of discrimination
(2) Protection of privacy
(3) Workplace safety and hygiene
(4) Compliance with labor laws
(5) Compliance with employment regulations
(6) Proper accounting and tax procedures
(7) Appropriate use of company assets

J-POWER Group Environmental Management Vision (Formulated April 1, 2004)

Basic Policy

The J-POWER Group adheres to the following Basic Policy.

■ Basic Stance

- As an energy supplier, we will contribute to the sustainable development of Japan and the rest of the world by harmonizing our operations with the environment and ensuring the constant supply of energy essential to human life and economic activity.

As an energy supplier, we will efficiently generate and continuously supply electric power essential to human life and economic activity by effectively using limited resources such as coal to meet diverse needs. We will contribute to sustainable development in Japan and the rest of the world as a whole by minimizing the environmental impact of our business activities, reducing environmental risks such as global warming, and improving eco-efficiency by achieving higher productivity with lower environmental load, thus promoting greater environmental responsibility while enhancing economic value.

■ Efforts Relating to Global Environmental Issues

- In accordance with the principles of the United Nations Framework Convention on Climate Change,* we will cost-effectively address issues relating to climate change on a global scale. We will continue to reduce CO_2 emissions per unit of electric power sold through an economically rational combination of measures including maintenance and improvement of the efficiency of energy use; development of low CO_2 emission power sources; development, transfer, and dissemination of new technologies; and utilization of the Kyoto Mechanisms. Furthermore, we will continue to work toward our ultimate goal of achieving zero emissions through the capture and storage of CO_2.

Since fossil fuels will inevitably remain a key energy source this century, global warming is one of the most important long-term issues facing humankind. As measures against global warming will entail major costs, we must adopt highly cost-effective measures and actions on a global scale to make larger reductions in greenhouse gas emissions at lower cost if we are to achieve sustainable development that harmonizes environmental and economic needs. This principle is set out in the United Nations Framework Convention on Climate Change, on which the Kyoto Protocol is based.

We will continue to reduce CO_2 emissions per unit of electric power sold through an economically rational combination of measures that takes account of cost-effectiveness on a global scale. Such measures include maintenance and improvement of efficient energy use; development of low CO_2 emission power sources; development, transfer, and dissemination of new technologies; and utilization of the Kyoto Mechanisms.

Recognizing that it will be necessary within this century to capture and store CO_2 generated by the combustion of fossil fuels in order to keep supplying energy to people throughout the world in a sustainable manner, we have also set the ultimate goal of achieving zero CO_2 emissions. We will continue developing and testing technology to achieve that objective.

*Framework Convention on Climate Change, Article 3, Paragraph 3 (Principles)
"…lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost."

■ Efforts Relating to Local Environmental Issues

- We will take measures to reduce the environmental impact of our operations by saving, recycling, and reusing resources to limit the generation of waste and foster good community relations.

Recognizing that assuring attractive and safe living environments is the key to good community relations, both nationally and internationally, we work hard to earn community trust. We use the latest technologies and know-how to minimize the environmental impact of our operations on the air and water around our power stations, as well as reducing and appropriately processing waste by saving, reusing, and recycling limited resources. In addition, we ensure that we are prepared to deal with emergencies resulting from accidents or natural disasters.

■ Ensuring Transparency and Reliability

- We will ensure that our business activities comply with all laws and regulations, disclose a wide range of environmental information, and enhance communication with stakeholders.

We work to earn the trust of society by improving our environmental management and assuring complete compliance with laws and regulations, as well as by increasing corporate transparency through disclosure of a wide range of environmental information. At the same time, we strive to enhance communication with stakeholders about environmental issues, calling upon the skills and knowledge of the entire J-POWER Group to continue meeting stakeholder expectations in terms of our business development and environmental activities.

Fiscal 2010 J-POWER Group Environmental Action Guidelines

1. Efforts Relating to Global Environmental Issues

(1) Maintenance and Improvement of Energy Use Efficiency
- Maintain highly efficient operations at existing thermal power stations and employ highly efficient technologies in new facilities
- Maintain stable operation of existing hydro and geothermal power stations as well as of wind and recycling power stations
- Improve productivity of existing power stations by improvements in efficiency when replacing equipment
- Promote energy saving

(2) Development of Low CO_2 Emission Power Sources
- Construct nuclear power stations
- Effectively utilize renewable and unutilized energy
- Use natural gas-based fuels

(3) Development, Transfer, and Dissemination of New Technologies
- Carry out large-scale demonstration of oxygen-blown integrated coal gasification combined cycle (IGCC) technology
- Promote high-efficiency coal generation and R&D on CO_2 separation and capture technologies
- Promote small hydropower stations

(4) Utilization of the Kyoto Mechanisms and Other Measures
- Identify, cultivate, and utilize opportunities for Joint Implementation (JI), the Clean Development Mechanisms (CDM), and emissions trading

(5) Reduction of Emissions of Greenhouse Gases Other Than CO_2
- Reduce sulfur hexafluoride (SF_6) emissions from gasinsulated switch gear
- Reduce emissions of hydrofluorocarbons (HFCs) from air conditioners
- Reduce nitrous oxide (N_2O) emissions by appropriately managing thermal efficiency

2. Efforts Relating to Global Environmental Issues

(1) Reduction of Environmental Load
- Continue to reduce emissions
- Strengthen measures to prevent oil spills from equipment, etc. and be prepared so that emergencies can be dealt with in an appropriate and timely manner
- Design and introduce efficient and environmentally friendly plant and equipment when constructing or renovating facilities

(2) Promotion of the 3Rs (Reduce, Reuse, and Recycle waste) and Proper Disposal of Waste
- Recycle and reuse recyclable resources and make efforts toward zero emission* production
- Promote green purchasing efforts in line with the J-POWER Group Green Purchasing Guidelines
- Properly maintain and manage landfill sites and implement closing procedures

(3) Management of Chemicals
- Fully comply with the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (PRTR Law)
- Take appropriate measures to deal with dioxins
- Properly manage and dispose PCBs
- Strive to reduce volumes of hazardous chemicals handled
- Respond appropriately to asbestos-related issues

(4) Natural Environment and Biodiversity Conservation Initiatives
- Take the natural environment and biodiversity into account in the various stages of business
- Give consideration to rare animal and plant species on land
- Give consideration to aquatic environments
- Implement forest conservation initiatives

(5) Environmental Conservation Initiatives in Overseas Projects
- Promote overseas transfer of environmental protection technologies
- Incorporate environment-friendly initiatives when formulating development plans and considering investment in projects, and ensure that those initiatives are carried out

(6) Implementation of Accurate Environmental Impact Assessments

3. Ensuring Transparency and Reliability

1) Continual Improvement of Environmental Management (Greater Reliability)

(1) Improvement of Environmental Management Level
- Maintain ISO 14001 certification at all certified J-POWER Group business locations
- Continue to enhance operation of the environmental management system (EMS) at all J-POWER Group companies
- Raise employee awareness of environmental issues
- Utilize environmental accounting and eco-efficiency indicators
- Request cooperation of business partners in environmental activities
- Renew the Eco-Leaf environmental labeling certification, which employs the life cycle assessment method
- Strengthen risk management

(2) Full Compliance with Laws, Regulations, Agreements, and other Rules
- Identify applicable laws, regulations, agreements, and other rules, and work to raise awareness and ensure compliance
- Fully comply with environment-related laws, regulations, agreements, and other rules

2) Communication with Society (Greater Transparency)

(1) Publication of Environmental Information
- Carry out environmental reporting

(2) Increased Engagement in Environmental Communication
- Carry out environmental communication
- Carry out regional environmental conservation activities

* Zero emissions
A concept proposed by the United Nations University for the creation of a system that would enable the transformation of waste materials into resources through cooperation among different industries (and companies) so that waste emissions (final disposal amounts) can be reduced to as close to zero as possible.

Environment-Related Fiscal Year Data

The following data represent annual values or year-end values in each fiscal year.
Unless specifically noted, includes data for Group companies*. However, data for fiscal 1990 is for J-POWER only.

* The sum of the figures in each column may not equal the total due to rounding.
Note: All figures include J-POWER and its consolidated subsidiaries. Except for the chart for power facilities, joint ventures have been accounted for based on the percentage ownership.

■ Power Facilities (maximum output)

	Unit	FY 1990	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Hydroelectric	GW	7.09	8.55	8.56	8.56	8.56	8.56
Thermal	GW	4.65	8.18	8.18	8.18	8.18	8.79
Coal-fired	GW	4.64	7.95	7.95	7.95	7.95	8.55
Natural gas	GW		0.22	0.22	0.22	0.22	0.22
Geothermal	GW	0.01	0.01	0.01	0.01	0.01	0.02
Wind power	GW		0.14	0.21	0.21	0.25	0.27
Total	GW	11.74	16.87	16.94	16.94	16.99	17.61

■ Electricity Output

	Unit	FY 1990	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Hydroelectric	GWh	12,451	10,187	12,212	10,428	9,470	10,004
Thermal	GWh	29,551	58,922	52,429	57,050	53,648	50,742
Coal-fired	GWh	29,452	58,070	51,624	56,260	52,979	50,224
Natural gas	GWh		748	701	686	589	415
Geothermal	GWh	99	104	104	104	80	103
Wind power	GWh		203	254	321	322	393
Total	GWh	42,002	69,312	64,870	67,799	63,439	61,140

■ Electric Power Sold

	Unit	FY 1990	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Hydroelectric (excluding pumped storage)	GWh	10,046	8,583	10,633	8,287	8,384	9,214
Thermal	GWh	27,293	55,205	49,128	53,576	50,122	47,364
Coal-fired	GWh	27,206	54,413	48,381	52,842	49,505	46,887
Natural gas	GWh		698	652	640	547	383
Geothermal	GWh	87	94	94	94	70	94
Wind power	GWh		195	245	307	310	379
Total	GWh	37,338	63,983	60,006	62,170	58,816	56,957

■ Fuel Consumption

	Unit	FY 1990	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Coal (dry coal 28 MJ/kg equivalent)	million t	9.56	18.39	16.30	17.91	16.97	15.94
Use intensity (coal-fired thermal)	t/GWh	351	338	337	339	343	344
Natural gas	million m^3N		124	117	115	99	71
Heavy oil	million kl	0.1	0.06	0.06	0.05	0.04	0.04
Diesel	million kl	0.01	0.03	0.02	0.03	0.03	0.05

Note: Denominator for use intensity represents electric power sold by coal-fired thermal power stations.

■ Greenhouse Gas Emissions

	Unit	FY 1990	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
CO_2 emissions (domestic and overseas power generation)*	million t-CO_2	24.67	49.49	44.91	49.86	49.07	46.52
	kg-CO_2/kWh	0.66	0.72	0.68	0.70	0.69	0.66
(domestic power generation)	million t-CO_2	24.67	47.18	42.14	45.96	43.50	40.88
	kg-CO_2/kWh	0.66	0.74	0.70	0.74	0.74	0.72
SF_6 emissions	t	-	0.1	0.1	0.0	0.1	0.0
Handled	t	-	3.3	6.4	4.4	7.9	5.9
Recovery rate	%	-	98	99	99	99	99
HFC emissions	t	-	0.1	0.0	0.1	0.1	0.2

* Figures for CO_2 emissions exclude the Wakamatsu Research Institute. Figures for CO_2 emissions (domestic and overseas power generation) are formulated from figures for J-POWER and aggregates of figures for consolidated subsidiaries and equity method affiliates for their specific fiscal years, in proportion to our investment ratio.

Notes: 1. Denominators for emission intensity represent electric power sold.
2. For the CO_2 calculation method, see p. 45.

■ Average Thermal Efficiency of Coal-fired Power Stations (at generation point)

	Unit	FY 1990	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Average thermal efficiency (at generation point)	%	39.0	40.5	40.4	40.3	40.1	40.3

■ Usage of Specified CFCs

		Unit	FY 1990	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Specified CFCs	Stocked	t	3.6	1.8	1.8	1.8	1.7	1.0
	Consumed	t	0.7	0.0	0.0	0.0	0.0	0.0
Halons	Stocked	t	4.7	3.9	4.3	4.6	4.6	4.6
	Consumed	t	0.0	0.0	0.0	0.0	0.0	0.0
Other CFCs	Stocked	t	2.8	10.2	9.9	9.5	9.2	12.6
	Consumed	t	0.0	0.3	0.3	0.3	0.3	0.1
HFCs (CFC alternatives)	Stocked	t	–	7.7	8.4	5.9	10.8	11.3
	Consumed	t	–	0.1	0.0	0.1	0.1	0.2

■ SOx, NOx, and Soot and Dust Emissions

	Unit	FY 1990	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
SOx emissions	1,000 t	9.9	10.2	9.9	11.3	10.6	8.1
Intensity (thermal)	g/kWh	0.34	0.17	0.19	0.20	0.20	0.16
NOx emissions	1,000 t	26.4	28.9	27.9	28.5	26.7	22.3
Intensity (thermal)	g/kWh	0.90	0.49	0.53	0.50	0.50	0.44
Soot and dust emissions	1,000 t	1.0	1.0	0.9	1.0	0.8	0.6
Intensity (thermal)	g/kWh	0.03	0.02	0.02	0.02	0.02	0.01

Notes: 1. Soot and dust emissions are calculated from monthly measurements.
2. Denominators for emissions represent the electricity output of thermal power stations (excluding geothermal stations).

■ Industrial Waste Recycling

	Unit	—	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Volume generated	million t	–	2.23	1.96	2.18	2.14	2.00
Volume recycled	million t	–	2.09	1.86	2.15	2.10	1.96
Recycle rate	%	–	94	95	98	98	98

■ Coal-Ash and Gypsum Recycling

	Unit	FY 1990	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Coal-ash created	1,000 t	1,257	1,806	1,556	1,714	1,747	1,669
Coal-ash recycled	1,000 t	719	1,696	1,512	1,711	1,736	1,660
Coal-ash recycle rate	%	57.2	93.9	97.2	99.8	99.4	99.4
Gypsum created	1,000 t	–	380	334	360	330	263
Gypsum recycle rate	%	100	100	100	100	100	100

Note: For details on coal-ash recycling rate, see p. 63.

■ Office Power Consumption

	Unit	—	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Power consumed by offices (company total)	GWh	–	22.00	22.82	22.23	21.86	21.07
Head office* power consumption	GWh	–	8.89	8.73	8.61	8.61	8.53
Lighting/power sockets	GWh	–	1.76	1.78	1.80	1.72	1.71

* J-POWER head office building
Note: Figures for the base year (FY 2006) and beyond have been adjusted in accordance with the expansion/contraction of the range of data available for compilation.

■ Fuel Consumption in Offices (Gasoline Equivalent)

	Unit	—	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Consumption	kl	–	1,646	1,664	1,339	1,310	1,348

■ Rate of procurement of recycled copy paper

	Unit	—	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Copy paper* purchased	million sheets	–	62.41	69.53	57.84	56.05	57.17
Recycled copy paper* purchased	million sheets	–	57.22	65.87	54.87	55.18	56.79
Recycled copy paper* purchase rate	%	–	92	95	95	98	99

* A4 paper-size equivalent

J-POWER: Main Business Sites (as of March 2010)

In Japan	Name	Location
Head Office		Chuo-ku, Tokyo
Hydropower & Transmission System Department	Hokkaido Regional Headquarters	Sapporo-shi, Hokkaido
	East Regional Headquarters	Kawagoe-shi, Saitama
	Chubu Regional Headquarters	Kasugai-shi, Aichi
	West Regional Headquarters	Osaka-shi, Osaka
	Ohma Main-Transmission Line Project Construction Office	Mutsu-shi, Aomori
	Nishi-Tokyo Main Transmission Line Construction Office	Kawagoe-shi, Saitama
	Kitahon Power Cable Construction Preparation Office	Kameda-gun, Hokkaido
Thermal Power Department	Isogo Thermal Power Station	Yokohama-shi, Kanagawa
	Takasago Thermal Power Station	Takasago-shi, Hyogo
	Takehara Thermal Power Station	Takehara-shi, Hiroshima
	Tachibanawan Thermal Power Station	Anan-shi, Tokushima
	Matsushima Thermal Power Station	Saikai-shi, Nagasaki
	Matsuura Thermal Power Station	Matsuura-shi, Nagasaki
	Ishikawa Coal Thermal Power Station	Uruma-shi, Okinawa
	Onikobe Geothermal Power Station	Osaki-shi, Miyagi

In Japan	Name	Location
Ohma General Management Department	Ohma Nuclear Power Construction Office	Shimokita-gun, Aomori
	Aomori Branch Office	Aomori-shi, Aomori
Business Planning Department	Wakamatsu Operations & General Management Office	Kitakyushu-shi, Fukuoka
Corporate Planning & Administration Department	Hokuriku Office	Toyama-shi, Toyama
	Chugoku Office	Hiroshima-shi, Hiroshima
	Sendai Office	Sendai-shi, Miyagi
	Takamatsu Office	Takamatsu-shi, Kagawa
	Fukuoka Office	Fukuoka-shi, Fukuoka
Technology Development Center	Chigasaki Research Institute	Chigasaki-shi, Kanagawa
	Wakamatsu Research Institute	Kitakyushu-shi, Fukuoka

Overseas	Name
U.S.A.	Washington Office
China	Beijing Office
Vietnam	Hanoi Office
Sri Lanka	Upper Kotomale Hydropower Project Office
Vietnam	Son La Hydropower Project Office

Business Sites and Companies Receiving ISO 14001 Certification, Etc. (as of March 2010)

In 2002, the J-POWER Group completed the process of putting in place environmental management systems (EMS) at all of our business sites to guide the implementation of environmental initiatives based on our corporate philosophy. By the end of 2005, all of J-POWER's power generation, transmission, substation, and communication facilities had obtained ISO 14001 certification.

The table at the right shows the J-POWER Group business sites and companies that have received ISO 14001 certification as of the end of March 2010.

Facilities managed by J-POWER regional headquarters (Hokkaido, East Japan, Chubu, West Japan): hydroelectric stations, transmission facilities, substations, telecommunication engineering centers, etc. Facilities managed by regional companies of JPHYTEC Co., Ltd., (Hokkaido, East Japan, Chubu, West Japan)
J-POWER thermal power stations (Isogo, Takasago, Takehara, Tachibanawan, Matsushima, Matsuura, Ishikawa Coal) JPec Co., Ltd., companies (Isogo, Takasago, Takehara, Tachibanawan, Matsushima, Matsuura, Ishikawa)
J-POWER Onikobe Geothermal Power Station JPec Co., Ltd., Onikobe Office
J-POWER Civil and Electrical Engineering Dept.
J-POWER Environment & Energy Business Dept. (Water Service Business Group, Subsurface Space Engineering Group)
JPHYTEC Co., Ltd. (Transmission and Compensation Division)
JPec Co., Ltd. (Wakamatsu Environmental Research Center)
JP Design Co., Ltd., main office
KEC Corporation (whole company)
Ichihara Power Co., Ltd.

Electric Utility Industry's Action Guidelines for Biodiversity (April 2010; Federation of Electric Power Companies of Japan)

Guiding principle: As electric power companies, we are grateful for the beneficence of nature, and will endeavor to realize sustainable business practices

I. We will strive to supply electricity with consideration of global warming and other global environmental problems that impact on biodiversity

1) Recognizing the importance of biodiversity and the beneficence of nature, we will give due consideration to our impact on ecosystems and local environments both in Japan and overseas when constructing and operating our facilities.
2) We will attempt to reduce our CO_2 emission intensity by measures including expansion of the use of nuclear power and renewable energies, and improving the thermal efficiency of thermal generation.
3) We will work to limit emissions of greenhouse gases when constructing facilities and in the processes of procurement and transport.

II. At the same time as steadily implementing environmental protection initiatives that contribute to biodiversity, we will endeavor to contribute to society

4) We will carefully analyze and understand the impact of our corporate activities on biodiversity, and we will take measures to protect it.
5) We will strive to contribute to society through activities to protect the environment such as the implementation of greening programs tailored to the characteristics of specific environments.

III. We will strive towards the realization of a material-cycle society that contributes to biodiversity

6) We will work to protect biodiversity and realize sustainable patterns of use by continuing to engage in 3R (reduce, reuse, recycle) activities, for example by attempting to make effective use of resources and reducing the amount of waste sent for final disposal.

IV. We will develop technologies and conduct R&D that contribute to biodiversity

7) We will proceed with R&D and develop technologies that protect biodiversity and contribute to stable patterns of use, and we will work to spread those technologies.

V. We will cooperate with local regions in the area of biodiversity, and we will widely communicate and share information concerning initiatives in relation to biodiversity

8) We will collaborate with local people, local governments, and regional research institutions.
9) We will communicate and share information on our business activities that take biodiversity into consideration in an easily understood form.

VI. We will strive to undertake voluntary activities that increase social awareness of biodiversity

10) We will endeavor to improve the level of environmental education we offer our employees.
11) We will contribute to increasing social awareness of biodiversity.

Eco Business by Group Companies

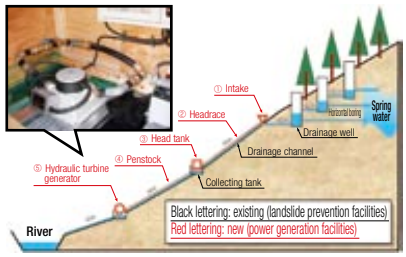
The J-POWER Group has established eco businesses of many kinds, leveraging environmentally-friendly technologies developed over many years of providing energy-related services. A few examples are introduced here.

Contributing to Global Environments through the Development of Small-scale Hydropower Projects
— Progress in the Introduction of Clean Energy —

JP Design Co., Ltd.

http://www.jpde.co.jp/ (Japanese only)

JP Design Co., Ltd. provides engineering services in the fields of civil engineering and construction. Using the hydropower technologies that it has fostered in collaborating with J-POWER, the company is involved in small-scale hydropower projects being developed by national and local governments, and is making a contribution to Japan's regional areas with "energy and the environment" as the axis of its activities. To offer one example, in fiscal 2009 the company was involved in a small-scale hydropower project commissioned by the Ministry of Land, Infrastructure, Transport and Tourism, and planned, designed, and constructed a small 300 W facility that uses spring water, a generally untapped resource. It is expected that the facility will be used to power street lighting, and will function as an emergency power source in the event of a disaster. In the future, JP Design will continue to make a contribution to the fight against global warming via hydropower developments.



Conceptual diagram of micro-hydropower project using spring water

Hydropower generation demonstration trial facility (Iida City, Nagano Prefecture)

Regional contribution through powering street lighting

Dry-Type Flue Gas Desulfurization-Denitrification System
— Regenerative Activated Coke Technology: ReACT —

J-POWER EnTech, Inc.

http://www.jpower.co.jp/entech_e/index.html/

One of J-POWER EnTech's core technologies is dry-type flue gas treatment, which allows users to remove multiple pollutants such as sulfur, nitrogen, dioxin, dust, and soot from flue gas in one operation, using almost no water. This technology is widely used in Japan at coal-fired power stations, steel mills, petrochemical facilities, waste incineration plants and other industrial facilities.

J-POWER EnTech has already delivered the most advanced flue gas treatment system designed for domestic steel mills, and it is displaying the highest performance of any system for the steel industry. The company has also supplied a flue gas treatment system for the J-POWER Isogo Thermal Power Station New No. 2 Unit, a facility operating at the world's highest level of environmental performance. This system is also being provided for use in power stations, steel mills and other facilities in Japan and overseas, where it is helping reduce the environmental burden in a wide range of fields.

Dry-type desulfurization system at Isogo Thermal Power Station New No. 2 Unit (Yokohama)

Utilizing Coal Ash to Contribute to Agriculture:
— Potassium Silicate Fertilizer —

KAIHATSU HIRYOU CO., Ltd.

http://www.jpsik.com/ (Japanese only)

KAIHATSU HIRYOU Co., Ltd., a J-POWER Group company, developed the world's first slow-release potassium silicate fertilizer made using coal ash from coal-fired power stations. Seeking to make more effective use of coal ash, the company began manufacturing the product in 1980. The potassium silicate fertilizer manufactured by the company is sold to farmer and growers in all 47 prefectures nationwide through ZEN-NOH (JA-Group). In the future, the company aims to make improvements in quality and the stability of supply, and to go on supporting agricultural production through the supply of this superior, environmentally friendly, and safe-to-use fertilizer.

The world's first potassium silicate fertilizer soluble in citric acid*, made from recycled coal ash generated at thermal power stations

* The fertilizer is soluble in a 2 percent solution of citric acid, but does not dissolve in weaker acids such as that exuded from roots. Since it dissolves gradually, its effectiveness is long-lasting.

Viewing the Environment through the Eyes of Biotechnology
— Analyzing Gene Expression using EG Microarrays —

Ecogenomics, Inc.

http://www.ecogenomics.co.jp/english/index.htm/

Based on the concept of "a fusion between the environment and biotechnology," Ecogenomics, Inc. uses tools termed "microarrays," formed by mounting a sample of the genetic material of an organism under study on glass or a semiconductor substrate, to test, analyze, and evaluate the effect of various chemical substances, wastewater, environmental water, and other factors on organisms and ecosystems at the genetic level.

The company is collaborating with the U.S. biotechnology venture company CombiMatrix, enabling it to apply the technique to every type of organism for which the genome is already known.

Environmental management at present chiefly focuses on managing concentrations of individual chemical substances such as heavy metals. However, the U.S. and other countries have already introduced and applied regulations to methods of environmental management using organisms, and studies are underway towards their introduction in Japan.

The latest biotechnology is continuing the challenge of attempting to realize environmental protection seen through the eyes of living organisms themselves.

EG Microarray Medaka 6000 and an example of a gene expression pattern*

* Red: Increased genes; Green: Reduced genes; Yellow: No change.
Effects on organisms can be analyzed and evaluated using patterns in which genes increase.

Environmental Accounting Data

Environmental Conservation Costs

(billion yen)

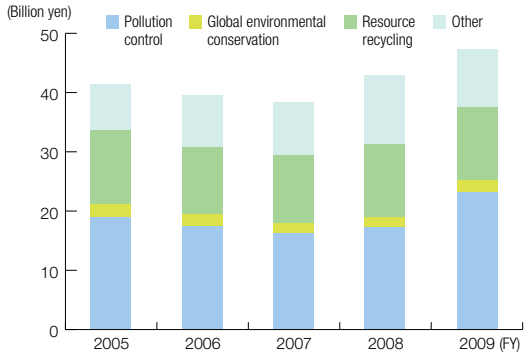
Category	Main measures and efforts	Cost
Pollution control	Air pollution control (desulfurization/ denitrification, soot and dust treatment), water pollution control (waste-water treatment), etc.	23.4
Global environmental conservation	Measures to reduce greenhouse gas emissions (maintaining high-efficiency operation of coalfired power stations, developing renewable and unutilized energy sources, maintenance costs for energy-saving equipment, emission control of greenhouse gases other than CO_2)	2.0
Resource recycling	Waste reduction through reuse and recycling; treatment and disposal of waste	12.5
Management activities	Monitoring and measurement of environmental load, labor costs for environmental conservation organizations, costs for environmental education, etc.	1.8
Research and development	High-efficiency generation, use of fuel cells, CO_2 capture and fixation, recycling of coal ash and gypsum, etc.	2.3
Social activities	Tree-planting, environmental advertising, environmental beautification, membership in environmental groups, preparation of sustainability report, etc.	2.2
International projects	Overseas cooperation projects for environmental conservation technologies	1.0
Other	Pollution load levy	2.0
Total		47.2

Environmental Conservation Benefits

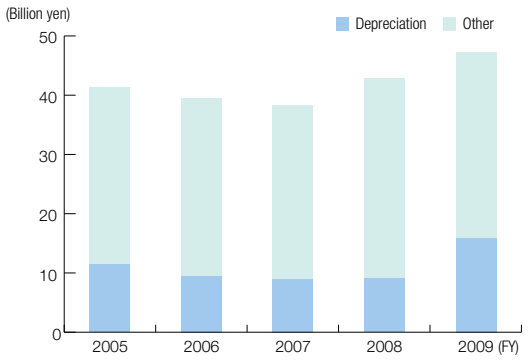
Environmental conservation benefit	FY 2005	FY 2009
SOx emissions intensity (g/kWh)	0.20	0.16
NOx emissions intensity (g/kWh)	0.50	0.44
Soot and dust emissions intensity (g/kWh)	0.02	0.01
CO_2 emissions intensity (kg-CO_2/kWh)	0.68	0.66
Average thermal efficiency of thermal power generation (%)	40.1	40.3
Coal ash recycling rate (%)	99.4	99.4
Industrial waste recycling rate (%)	98	98
Gypsum recycling rate (%)	100	100
Volume of driftwood recycled (1,000 m^3)	12	13
Employees completing internal environmental auditor training	76	
Sustainability report (copies published)	16,000	
Environmental pamphlet (copies published)	12,000	
Overseas consulting projects (cumulative total)	312	

Note: For detailed data on each category, see pp. 77–78, Environment-Related Fiscal Year Data, in the Reference Data section.

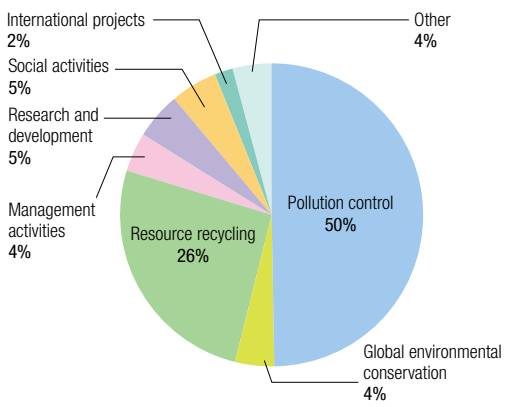
Environmental Conservation Costs: Comparison by Fiscal Year



Proportion of Depreciation and Other Costs



Environmental Conservation Costs: Breakdown by Category



Calculation Guidelines for Environmental Conservation Costs

- Period: April 1, 2009, to March 31, 2010
- Format: In accordance with Environmental Accounting Guidelines 2005 issued by the Ministry of the Environment
- Scope: Costs (including depreciation costs) for thermal power generation companies, which have the highest environmental load among J-POWER and Group company operations

Note: Costs were calculated focusing on expenses for the following: personnel/ contracting/repair/chemicals associated with operating and maintaining equipment; waste recycling and disposal; R&D; and overseas projects (contracting and personnel expenses). However, upstream and downstream costs associated with the contribution of hydroelectric power generation to measures against global warming, and with green purchasing efforts, were deemed to present problems in terms of calculation scope and method and thus were excluded from calculations.

Treaties and Laws Relating to Global Warming

Overview of the United Nations Framework Convention on Climate Change

The United Nations Framework Convention on Climate Change is a treaty that establishes an international framework for stemming global warming. It was adopted in June 1992 at the first World Summit on Sustainable Development in Rio de Janeiro (commonly known as the Earth Summit), and came into force on March 21, 1994. Thus far it has been ratified by 192 countries and regions.

The ultimate aim of the convention is to stabilize the concentration of greenhouse gases in the atmosphere at levels that will not cause dangerous human disruption of the earth's climate system.

Principles

1) Protection of the climate on the basis of common but differentiated responsibility
2) Consideration of special circumstances
3) Implementation of precautionary measures
4) Right and duty to promote sustainable development
5) Cooperation to promote a supportive and open international economic system

Note: Complete text of Principle 3:
The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost. To achieve this, such policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors. Efforts to address climate change may be carried out cooperatively by interested Parties.

Overview of the Kyoto Protocol

The Kyoto Protocol is a resolution establishing the greenhouse gas emissions-reduction targets for the Annex I countries. It was adopted in December 1997 at the Third Session of the Conference of the Parties to the UN Framework Convention on Climate Change (COP3) and came into force on February 16, 2005.

Notes:
1. Emissions trading:
International trading of emissions allowances (or emissions reduction units earned through CDM or JI). Annex I countries may add allowances acquired from other countries to their own allowances.
2. Joint Implementation (JI):
Mechanism whereby Annex I countries can jointly carry out GHG emissions-reduction projects and distribute the resultant reduction volume among the countries concerned. Applicable to reductions between 2008 and 2012.
3. Clean Development Mechanism (CDM):
Mechanism whereby Annex I countries can carry out GHG emissions-reduction projects in developing countries and distribute the resultant reduction volume among the countries concerned. Applicable to reductions in 2000 and after.

Targeted greenhouse gases (GHGs)	6 categories of gases: CO_2 (carbon dioxide), methane, N_2O (nitrous oxide), HFCs (hydrofluorocarbons), PFCs (perfluorocarbons), and SF_6 (sulfur hexafluoride)
Commitment period	2008~2012 (first commitment period)
Goal	To reduce average yearly emissions of greenhouse gases by the Annex I countries by at least 5 percent below 1990 levels. In Annex B of the Kyoto Protocol, the Annex I countries commit themselves to specific reduction targets; Japan's reduction target is 6 percent.
Use of sinks (absorption forests)	Countries may include in their calculation of emissions reduction the removal of CO_2 by "sinks" resulting from land use change and forestry activities, limited to afforestation, reforestation, and deforestation since 1990.
Kyoto Mechanisms	Emissions trading,[1] Joint Implementation (JI),[2] and the Clean Development Mechanism (CDM)[3] have been adopted as economically rational means to achieve reduction targets on a global scale.

Overview of the Revised Kyoto Protocol Target Achievement Plan

In accordance with the Act on Promotion of Global Warming Countermeasures (Act No. 117, 1998), on April 28, 2005, the Japanese government formulated the Kyoto Protocol Target Achievement Plan establishing the measures and mechanisms needed for Japan to be certain of meeting its Kyoto Protocol commitment to reduce emissions by 6 percent from the 1990 level. The plan was later revisited and updated following a review of the targets and measures it laid down. On March 28, 2008, a fully revised plan was adopted by cabinet resolution.

Countermeasures and Policies to Achieve the Targets

1. Countermeasures and Policies Concerning Reduction, Removal, etc. of Greenhouse Gas Emissions

(1) Countermeasures and Policies Concerning Reduction of Greenhouse Gas Emissions

Key measures added

•Promotion of voluntary action plans •Improvement of the energy efficiency of homes and other buildings •Measures involving toprunner products, etc. •Thoroughgoing measures to save energy in factories and other places of business •Improvement of vehicle fuel efficiency •Promotion of measures to reduce emissions by small- and medium- sized enterprises •Measures for improvements in areas including agriculture, forestry, and fisheries; water and sewage systems; and traffic flow •Urban greening and efforts concerning wastes, the three fluorinated gases, etc. •Promotion of the use of new forms of energy

(2) Greenhouse Gas Sink Measures and Policies

•Forest management through thinning, etc., and promotion of the campaign to create well-managed forests

2. Cross-Sectoral Policies

•Systems for calculation, reporting, and public disclosure of greenhouse gas emissions
•Development of national campaign

■ Quantitative Targets for Emissions Reduction and Absorption of Greenhouse Gases

		Emissions target range for FY 2010*	
		million t-CO_2	Ratio to base year total emissions
Energy-related CO_2		1,076~1,089	+1.3%~+2.3%
	Industrial sector	424~428	–4.6%~–4.3%
	Commercial and other sectors	208~210	+3.4%~+3.6%
	Residential sector	138~141	+0.9%~+1.1%
	Transport sector	240~243	+1.8%~+2.0%
	Energy conversion sector	66	–0.1%
Non-energy-related CO_2, CH_4, N_2O		132	–1.5%
Three fluorinated gases		31	–1.6%
Greenhouse gas emissions		1,239~1,252	–1.8%~–0.8%

* Japan will ensure achievement of its 6 percent reduction target under the Kyoto Protocol by combining the reduction of greenhouse gas emissions with such means as the use of carbon sinks and the Kyoto Mechanisms.

Environmental Action Plan by the Japanese Electric Utility Industry

(Summarized from the Environmental Action Plan by the Japanese Electric Utility Industry, The Federation of Electric Power Companies of Japan, September 2009)

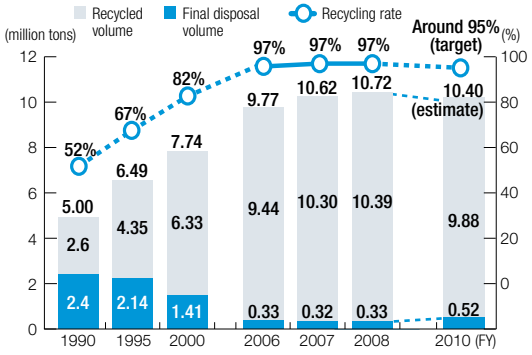
The Environmental Action Plan by the Japanese Electric Utility Industry lays out the electric industry's policy and plan for dealing with global warming and other environmental issues. Each year the plan is reviewed in relation to the industry's progress toward its goals and domestic and international trends. This plan is incorporated in the Keidanren Voluntary Action Plan on the Environment, adopted by Nippon Keidanren in June 1997. Progress toward the Keidanren plan as a whole and the various voluntary industry plans that make it up is regularly monitored by national councils and similar organs.

Measures for Waste Reduction and Recycling

Waste Recycling Rate Targets

Through fiscal 2010, we aim to maintain our waste recycling rate at around 95 percent.

■ **Waste Recycling Rate Target for the Electric Utility Industry**



Note: After landfills for final disposal are closed, the land is utilized for the expansion of power generation facilities or for other industrial purposes. A portion of the coal ash used at such sites has been included in "volume recycled" from fiscal 2004 as land reclamation material in accordance with the position taken by the national government.

■ **Trends in Recycling of Major Wastes and By-products**

(Unit: million tons)

Type			FY 1990	FY 2006	FY 2007	FY 2008
Waste	Combustion residue, dust and soot (coal ash)	Volume generated	3.47	7.05	7.68	7.80
		Recycled volume (Recycling rate)	1.37 (39%)	6.83 (97%)	7.46 (97%)	7.58 (97%)
	Construction waste material	Volume generated	0.40	0.42	0.41	0.38
		Recycled volume (Recycling rate)	0.21 (53%)	0.41 (97%)	0.40 (98%)	0.37 (97%)
	Scrap metal	Volume generated	0.14	0.20	0.22	0.34
		Recycled volume (Recycling rate)	0.13 (93%)	0.19 (98%)	0.22 (99%)	0.34 (100%)
Byproducts	Gypsum from desulfurization process	Volume generated	0.85	1.87	1.97	1.85
		Recycled volume (Recycling rate)	0.85 (100%)	1.87 (100%)	1.97 (100%)	1.85 (100%)

Measures to Mitigate Climate Change

CO_2 Emissions Suppression Targets

From fiscal 2008 to fiscal 2012, we aim to further reduce CO_2 emissions intensity (emissions per unit of user-end electricity) by an average of approximately 20 percent to about 0.34 kg-CO_2/kWh from the fiscal 1990 level.

■ **Goal of 12 FEPC-Affiliated Companies**

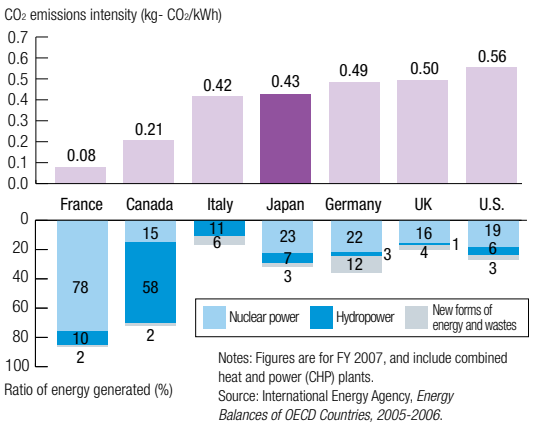
CO_2 emissions (kg-CO_2) = Electric power consumption (electric energy) (kWh) × CO_2 emissions intensity (CO_2 emissions per unit of electric power consumed) (kg-CO_2/kWh)

■ **Electric Utility Industry's CO_2 Emissions**

Item \ Fiscal year	1990 (results)	2006 (results)	2007 (results)	2008 (results)	2008 to 2012 (five-year average)
Electric power consumption (billion kWh)	659	889	920	889	(est.) 931
CO_2 emissions (million t- CO_2)	275	365	417	332	(est.) —
CO_2 emissions intensity of user-end electricity (kg- CO_2/kWh)	0.417	0.410	0.453	0.373	(est.) —

Reference Information

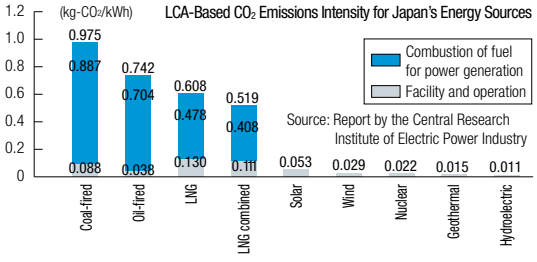
■ **Country-by-Country Comparison of CO_2 Emissions Intensity**
(per unit of energy generated; preliminary calculation by FEPC)



Notes: Figures are for FY 2007, and include combined heat and power (CHP) plants.
Source: International Energy Agency, *Energy Balances of OECD Countries, 2005-2006.*

■ **Life Cycle Assessment-Based CO_2 Emissions Intensity for Japan's Energy Sources**

The chart below represents the CO_2 emissions for various power sources when the entire life cycle is taken into account (LCA CO_2). This method calculates CO_2 emissions not only from the combustion of fuel for power generation but also from all energy consumed from such activities as mining and drilling, building power generation facilities, transporting fuel, refining fuel, operating and maintaining facilities, and so forth.



The J-POWER Group's Contribution for Japan to Achieve the Kyoto Target

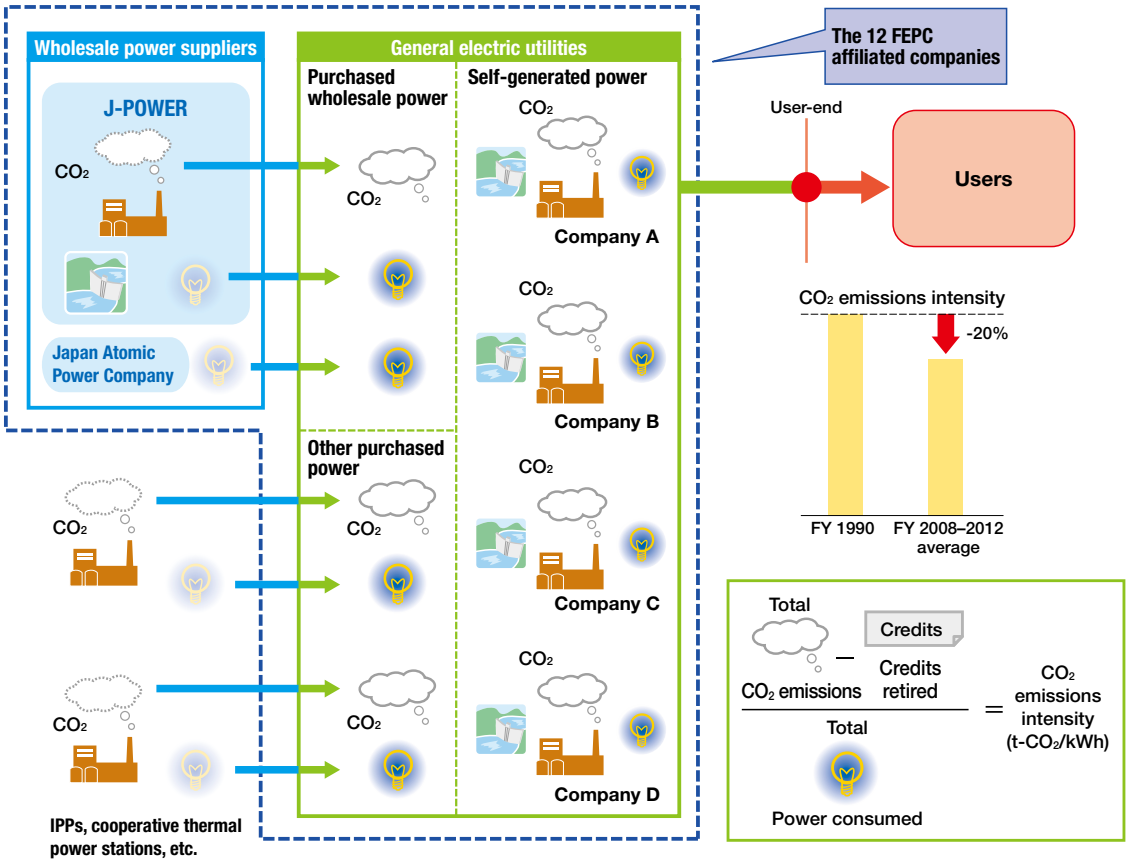
J-POWER, one of the 12* members of the Federation of Electric Power Companies of Japan (FEPC), is supporting the federation's program—the Environmental Action Plan by the Japanese Electric Utility Industry—to contribute to Japan's achievement of its Kyoto target.

Based on the Act on Promotion of Global Warming Countermeasures (Act No. 117, 1998) the Japanese government adopted the Kyoto Protocol Target Achievement Plan, a program to provide a series of necessary measures for surely achieving the Kyoto target of the 6 percent reduction in greenhouse gas emissions from 1990 levels, in a Cabinet resolution on April 28, 2005 (revised on March 28, 2008). As part of the industrial sector's efforts, the Keidanren Voluntary Action Plan on the Environment of the Nippon Keidanren has been incorporated into the governmental program, and the FEPC's program, composing a part of Nippon Keidanren's program, has in turn been included in the governmental program. The FEPC's program has also been incorporated into the governmental program as part of the energy supply sector's efforts to reduce CO_2 emissions.

The FEPC's program, the Environmental Action Plan by the Japanese Electric Utility Industry, has set the following target: From fiscal 2008 to fiscal 2012, we aim to further reduce CO_2 emissions intensity (emissions per unit of user-end electricity) by an average of approximately 20 percent from the fiscal 1990 level. One means to achieve this target is the retirement of emission credits gained by electric utility companies through the Kyoto Mechanisms to offset CO_2 emissions.

Because J-POWER is a wholesale power supplier without consumption points, the electric power and emissions it generates is directly reflected in the emissions of general electric utilities. J-POWER is therefore working in cooperation with general electric utilities to reduce CO_2 emissions. Specific efforts include the maintenance and improvement of the generation efficiency of coal-fired power stations, the development of energy sources with low CO_2 emissions such as nuclear power, the development of innovative technologies including those relating to coal gasification and CO_2 capture, and the utilization of CDM and JI credits. In these ways, J-POWER continues to press forward toward joint achievement of the targets set forth in the Environmental Action Plan by the Japanese Electric Utility Industry.

* The 12 companies affiliated with the Federation of Electric Power Companies of Japan are the 10 FEPC member companies (Hokkaido Electric Power Co., Inc., Tohoku Electric Power Co., Inc., Tokyo Electric Power Co., Inc., Chubu Electric Power Co., Inc., Hokuriku Electric Power Co., Inc., Kansai Electric Power Co., Inc., Chugoku Electric Power Co., Inc., Shikoku Electric Power Co., Inc., Kyushu Electric Power Co., Inc., and Okinawa Electric Power Co., Inc.) plus J-POWER and the Japan Atomic Power Company.



Glossary

(Page numbers indicate major citations.)

A

Advanced boiling water reactor (ABWR)
p. 21

A nuclear reactor that incorporates all the latest BWR (boiling-water reactor) technologies, including use of steel reinforced concrete for the containment vessel and a self-contained reactor recirculation pump, resulting in significant improvements in terms of safety, reliability, and cost.

Annex I countries
pp. 55, 82

Countries designated in Annex I of the United Nations Framework Convention on Climate Change, which have committed themselves to reducing emissions of greenhouse gases. Includes countries generally referred to as developed countries as well as those transitioning to market economies, such as former republics of the Soviet Union and Eastern European countries.

B

Biomass
pp. 11, 28, 45, 46, 49, 51, 65, 70, 72

Renewable organic resources of plant and animal origin other than fossil fuels.

C

Carbon dioxide capture and storage (CCS)
pp. 46, 53, 54, 69, 72

A system for capturing CO_2 from factory and power station emissions and transferring and storing the captured CO_2 to sequester it from the atmosphere over the long term. The two storage options are storage in geological formations and storage in the ocean.

Chemical oxygen demand (COD)
p. 43

The amount of oxygen required to oxidize the pollutants (primarily organic) in water. Used as an indicator to measure pollution of coastal waters and lakes.

Chlorofluorocarbon (CFC) alternatives
pp. 57, 78, 82

Chemicals used in refrigerators and in the manufacture of semiconductors in place of chlorofluorocarbons, which destroy the ozone layer. Because their greenhouse effect is several thousands or even tens of thousands times that of CO_2, they were included among the gases targeted for reduction at COP3 held in Kyoto in December 1997.

Cool Earth 50
p. 53

A long-term target for combating global warming proposed in May 2007 by then-Prime Minister Shinzo Abe. It set the goal of halving global CO_2 emissions by 2050.

D

Designated public institution
p. 17

A public institution designated by the prime minister based on the Basic Act on Disaster Control Measures and the Act on the Peace and Independence of Japan and Maintenance of the Nation and the People's Security in Armed Attack Situations etc. Included are institutions of a public nature such as Japan Broadcasting Corporation and the Bank of Japan, as well as companies providing basic public services such as the supply of electricity and gas, transportation, and communications. Designated public institutions are obliged to cooperate with local governments and among themselves to help prevent disasters and carry out measures to protect the people of Japan. J-POWER is a designated public institution under both of the Acts mentioned above, and it intends to undertake disaster prevention and the protection of the public through the supply of electricity.

Dioxin(s)
pp. 63, 66, 76

Generic name for polychlorinated dibenzo-p-dioxin (PCDD), polychlorinated dibenzofuran (PCDF), and coplanar polychlorinated biphenyl (coplanar-PCB). Toxic substances generally present in the environment in trace amounts and suspected of posing grave danger to human life and health. Under the Act on Special Measures against Dioxins, which came into force in January 2000, dioxin emissions from waste incinerators and other sources are strictly regulated.

E

Eco-efficiency
pp. 44, 75, 76

A method for quantifying, comparing, and evaluating activities to reduce the amount of water, electricity, and raw materials used and to reduce the volume of waste, effluent, and exhaust gas generated in business operations, as well as efforts at legal compliance and control of environmental pollution.

Environmental accounting
pp. 44, 76, 81

A mechanism for accurately determining and disclosing what a company invests and spends on environmental conservation and the effect of such spending—something not reflected in traditional financial analysis. Environmental accounting benefits companies by providing a quantitative assessment of their efforts to protect the environment so that they can improve the cost-effectiveness of their business activities with respect to environmental costs. It benefits stakeholders by making available corporate environmental accounting data in the form of environmental reports, etc., which can be used as yardsticks for measuring and comparing the environmental efforts of different companies.

Environmental Action Plan by the Japanese Electric Utility Industry
pp. 57, 83, 84

Plan for positive, voluntary environmental action by electric utilities, compiled by 12 organizations affiliated with the Federation of Electric Power Companies of Japan. Establishes concrete goals and outlines active efforts to address global warming, build a recycling-based society, etc. To ensure transparency, progress under the plan is reviewed each year and the results are made available to the public.

Environmental management system (EMS)
pp. 41, 67, 76, 79

A system by which organizations employ the PDCA management cycle to continuously improve the environment in an effort to comply with laws and regulations and take initiative in protecting the environment.

F

Fuel cell
pp. 54, 81

A device that converts externally supplied hydrogen and oxygen into electricity through a chemical reaction. Because fuel cells can achieve high generating efficiency and the heat generated can also be utilized, they have a high net energy efficiency and offer an effective means of saving energy and reducing CO_2 emissions. Fuel cells are particularly friendly to the environment because they dispense with combustion, thus giving off few air pollutants, and because they generate electricity without using rotating parts they are relatively quiet.

G

Gas-turbine combined-cycle generation
pp. 11, 49

A power generation method combining gas turbines and steam turbines. The pressure of the exhaust gas created when the fuel is burned within compressed air drives the gas turbine, and the residual heat is used to run the steam turbine. Combining these two processes results in high generating efficiency.

Green purchasing
pp. 41, 64, 76, 81

Placing priority on minimizing the environmental load in the purchase of goods and services by emphasizing the effect on the environment, as opposed to price, quality, convenience, or design.

H

Hydrofluorocarbons (HFCs)
pp. 57, 76–78, 82

Chemicals used in refrigerators, car air conditioners, etc., beginning around 1991, after CFCs and HCFCs were subject to controls out of concerns that they destroy the ozone layer. HFCs are artificial greenhouse gases with a greenhouse effect ranging from 140 to 11,700 times that of CO_2.

I

Independent power producer (IPP)
pp. 3, 4, 9, 11, 84

A business, other than a wholesale power supplier, that supplies electricity to general electric utilities.

Industrial waste
pp. 41–44, 63, 78, 81

Wastes such as ash, sludge, waste oil, waste acid, waste alkali, and waste plastics generated in the course of business operations. The Waste Management and Public Cleansing Act calls for proper disposal and incineration of industrial waste.

Integrated coal gasification fuel cell combined cycle system (IGFC)
pp. 46, 54

A triple combined power generation system achieved by combining the fuel cell, gas turbine, and steam turbine; the ultimate coal-fired thermal power generation system.

Integrated coal gasification combined cycle system (IGCC)
pp. 46, 53, 54, 76

A combined power generation system consisting of gas turbines that generate electricity by firing gas produced from coal and steam turbines that use the exhaust heat from the gas turbines.

Internal Control Reporting System
p. 16

From the perspective of investor protection, this system is aimed at ensuring the reliability of financial reporting. The term refers to the stipulations of the Financial Instruments and Exchange Act's Article 24-4-4 and Article 193-2, which set forth matters relating to internal control. Specifically, the system requires that applicable corporations and corporate groups issue internal control reports evaluating the internal structures essential to ensuring validity of financial statements and other information and that the statements be accompanied by an audit certificate issued by a certified public accountant or audit firm.

K

Kyoto Mechanisms
pp. 41, 45, 55, 56, 75, 76, 82, 84

Please refer to p. 55, 82.

Kyoto Protocol
pp. 45, 55–57, 75, 82, 84

Please refer to p. 82.

L

Lower heating value (LHV)
pp. 42, 46

Heating value refers to the amount of heat released when completely combusting a specified amount (1 kg, 1 m^3, 1 l) of fuel at a specified state (for example, 1 atm and 25°C) with a sufficient amount of dry air, then cooling the combustion product gas to the original temperature (in this case, 25°C). Higher heating value includes the latent heat of condensation of any vapor contained in the combustion product gas, whereas lower heating value assumes that vapor remains in that state and therefore does not include the latent heat of condensation. Lower heating value is determined by subtracting the latent heat of vapor condensation from the higher heating value measured by a calorimeter, and is calculated using the following equation:
Lower heating value = Higher heating value – latent heat of vapor condensation x amount of vapor

M

Methane (CH_4)
pp. 55, 57, 82

A main component of natural gas. Also produced through the decay or fermentation of organic matter. The second most common greenhouse gas, after CO_2, with a greenhouse effect 21 times that of CO_2.

Mixed-oxide fuel (MOX fuel)
pp. 21–22

Mixed oxide fuel consisting of uranium mixed with plutonium recovered by reprocessing spent nuclear fuel. In Japan, the use of MOX fuel in light-water and other reactors to generate electricity is referred to as "pluthermal." While Japan's pluthermal plan originally called for use of a one-third MOX core for fuel, the "full MOX" plan calls for a 100% MOX core.

N

Nitrogen oxides (NOx)
pp. 8, 41, 43, 44, 47, 58, 62, 78, 81

General term for compounds made up of nitrogen and oxygen. NOx is invariably produced during combustion as oxygen binds with nitrogen in the air and/or in the substance being burned. High-temperature combustion in the boilers of electric power stations or in automobile engines yields nitrogen monoxide, and this NO is further oxidized to form the stable compound nitrogen dioxide (NO_2), which is emitted into the atmosphere. Ultraviolet light from the sun reacts with nitrogen oxides in the atmosphere to create ozone and other photochemical oxidants.

Nitrous oxide (N_2O)
pp. 51, 57, 76, 82

Also known as dinitrogen monoxide. A major greenhouse gas (along with carbon dioxide, methane, tropospheric ozone, and chlorofluorocarbons) with a greenhouse effect 310 times that of CO_2. Said to be generated by combustion and application of nitrogen fertilizer.

Non-industrial waste
pp. 42, 43, 51, 64, 65

Defined as waste other than industrial waste under the Waste Management and Public Cleansing Act. Further divided into household waste and business waste (waste from offices, eating and drinking establishments, etc.).

P

Perfluorocarbons (PFCs)
pp. 57, 82

Chemicals used for semiconductor manufacturing beginning in the 1980s. PFCs are artificial greenhouse gases with a greenhouse effect 6,500 to 9,200 times that of CO_2.

Polychlorinated biphenyl (PCB)
pp. 66, 68, 76

An organic chlorinated compound first produced industrially in 1929 and thereafter used for a wide range of applications because of its stability, heat resistance, and performance as an insulator. In time it became clear that PCB, which takes a long time to break down, tends to accumulate in living tissue and cause long-term toxicity, and its manufacture, import, and use in new products was banned in 1974 under the Law Concerning the Examination and Regulation of Manufacture, etc., of Chemical Substances. In addition, the Act on Special Measures concerning Promotion of Proper Treatment of PCB Wastes, which came into force in July 2001, calls for detoxification treatment of PCB waste currently in storage by 2016.

Polychlorinated biphenyl (PCB) regional waste treatment program
p. 66

In 2001, the government enacted the Act on Special Measures concerning Promotion of Proper Treatment of PCB Wastes and revised the Japan Environment Corporation Law to establish a framework for the treatment by 2016 of the PCB waste in storage since production and use was banned in 1874. As part of this framework, the Japan Environment Corporation (name changed to Japan Environmental Safety Corporation in 2004) set up five regional treatment facilities in Hokkaido, Tokyo, Toyota, Osaka, and Kitakyushu, where PCB waste is now being treated.

Power producer and supplier (PPS)
pp. 3–4

A business that provides electricity to meet a certain level of demand (in general, contract demand of at least 2,000 kW in a single service area served by extra-high voltage lines maintained by general electric utilities, excluding Okinawa Electric Power Co.; in the case of Okinawa Electric Power Co., contract demand of at least 20,000 kW in a single service area served by power lines carrying at least 60,000 volts), excluding the general electric utilities that maintain the transmission lines. A new category of business established under the revised Electricity Business Act of 1999.

Pulverized coal-fired (PCF) power
pp. 47, 54

Method of power generation whereby pulverized coal and air are placed in a boiler for combustion.

Renewable energy
pp. 12, 13, 44–46, 49–52, 55, 70, 79, 84

Energy derived from such natural phenomena as sunlight, water, wind, waves, and biomass, as opposed to such fossil fuels as coal and oil that exist in the earth in limited quantities.

River maintenance flow
pp. 49, 60

A minimum river flow determined for each river by considering all the conditions needed to restore or create a sound river environment, as by restoring habitat for fish, improving the scenery, etc. Established with the goal of minimizing problems caused by low water around hydroelectric power stations, as a tool for improving the river environment and restoring clean water flow.

S

Soot and dust
pp. 43, 44, 62, 78, 81, 83

The Air Pollution Control Act classifies particles that remain suspended in the atmosphere according to source. Soot and dust is that generated when matter is burned, general dust is that generated or dispersed when matter is broken up by mechanical treatment or from deposition of resultant particles, and particulate matter is that generated by the operation of motor vehicles.

Specially controlled industrial waste
p. 43

Explosive, toxic, or infectious industrial waste requiring strict controls under the Waste Management and Public Cleansing Act. Includes waste oil with a low flash point, medical waste, PCBs, asbestos, and sludge containing high concentrations of heavy metals.

Sulfur hexafluoride (SF_6)
pp. 41, 57, 77

A compound of sulfur and fluorine produced industrially; SF_6 does not exist in nature. Because it is chemically stable and an excellent insulator, it is widely used in the electric industry as a gas insulator in circuit breakers and other devices. Its greenhouse effect is 23,900 times that of CO_2.

Sulfur oxides (SOx)
pp. 8, 41, 43, 44, 47, 58, 62, 78, 81

General term for compounds made up of sulfur and oxygen, including sulfur dioxide (SO_2), sulfur trioxide (SO_3), and sulfuric acid mist (H_2SO_4). Sulfur oxides are generated from the sulfur content in coal and heavy oil when they are fired as fuel in factories and thermal power stations and are released into the atmosphere in exhaust gases. As a substance responsible for acid rain, they are a source of atmospheric pollution.

Sustainability Reporting Guidelines
p. 1

Set of guidelines adopted by the Global Reporting Initiative (GRI; an international nongovernmental organization involving the UN Environmental Programme, environmental groups, institutional investors, accountants' associations, and corporations from various countries) to standardize sustainability reports, i.e., company reports that cover not only environmental but also social and economic aspects of business activity from the standpoint of sustainable development.

Sustainable development
pp. 1, 5–7, 10–13, 15, 29, 30, 34, 41, 72, 75, 82

The 1987 report of the World Commission on Environment and Development, Our Common Future, defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The 1991 report Caring for the Earth, jointly compiled by the International Union for Conservation of Nature, the United Nations Environmental Programme, and the World Wide Fund for Nature, defines it as "improving the quality of people's lives while living within the carrying capacity of supporting ecosystems."

T

Thermal efficiency
pp. 8, 10, 41, 44, 46–48, 57, 76, 77, 79, 81

For an electric power generating facility, the ratio of electric power generated (converted to thermal units) to heat energy input.

Thermal water discharge
p. 61

In thermal and nuclear power generation, the steam that powers the turbine is cooled and turned to water in a condenser so that it can be used again. In almost all Japanese power stations, seawater is used for cooling in the condensers. As the seawater passes through the condenser, its temperature rises. It is then returned to the ocean through the discharge outlet, at which point it is referred to as thermal water discharge.

U

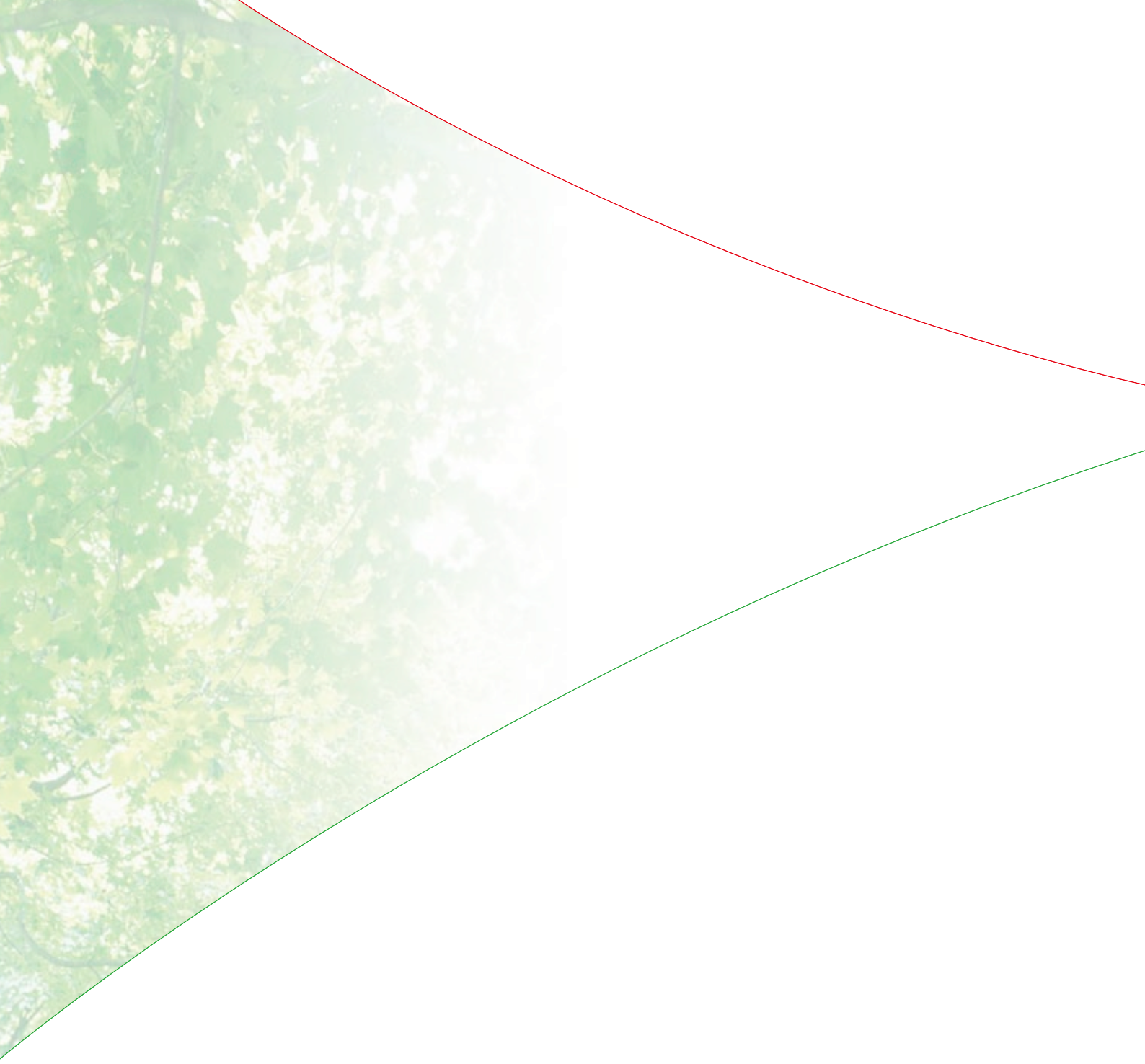
Ultra super critical (USC)
pp. 12, 45–47, 53

A steam turbine technology that makes use of advanced steam conditions, beyond those used in conventional super critical turbines (pressure 22.1 MPa temperature 566ºC), to improve the efficiency of thermal power stations.

W

Wheeling
p. 3

The delivery by a power producer and supplier of power received from a third party to users via its own transmission lines and other equipment.



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