J-POWER: Main Business Sites (as of March 2012)

In Japan	Name	Location
Head Office		Chuo-ku, Tokyo
Hydropower 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
	Isawa Hydro Project Construction Office	Oshu-shi, Iwate
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
Transmission System & Telecommunications Department.	Ohma Main Transmission Line Project Construction Office	Mutsu-shi, Aomori
	Nishi-Tokyo Main Transmission Line Construction Office	Kawagoe-shi, Saitama
	Kitahon Power Cable Construction Office	Nanae-cho, Kameda-gun, Hokkaido

In Japan	Name	Location
Ohma General Management Department	Ohma Nuclear Power Construction Office	Ohma-machi, Shimokitagun, 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
	Tohoku Office	Sendai-shi, Miyagi
	Shikoku Office	Takamatsu-shi, Kagawa
	Kyushu Office	Fukuoka-shi, Fukuoka
Research & Development Department	Chigasaki Research Institute	Chigasaki-shi, Kanagawa
	Wakamatsu Research Institute	Kitakyushu-shi, Fukuoka

Overseas	Name
China	Beijing Office
Vietnam	Hanoi Office
Sri Lanka	Upper Kotomale Hydropower Project Office
Vietnam	Son La Hydropower Project Office

Main Consolidated Subsidiaries (as of March 2012)

Company	Percentage ownership (%)	Main business	Location
Jpec Co., Ltd.	100	Construction, engineering, design, consulting, and maintenance inspections for thermal and nuclear power plants; unloading and transport of coal for thermal plants, sales of fly ash, and marine transport of coal fuel for electricity generation; environmental protection studies and planning	Chuo-ku, Tokyo
JPHYTEC Co., Ltd.	100	Construction, engineering, design, consulting, and maintenance inspections for hydropower plants and power transmission facilities; real estate indemnity, land surveying, civil engineering work, general architecture, project management	Chiyoda-ku, Tokyo
JP Business Service Corporation	100	Operation of public welfare facilities; building maintenance; administrative, labor, and accounting services; computer software development	Koto-ku, Tokyo
J-POWER RESOURCES Co., Ltd.	100	Import, sales and transport of coal	Chuo-ku, Tokyo
KEC Corporation	100	Installation and maintenance of electronic and communications equipment	Bunkyo-ku, Tokyo
JP Design Co., Ltd.	100	Design, administration, research and construction consulting for electric power facilities, general construction, etc.	Chiyoda-ku, Tokyo
EPDC CoalTech and Marine Co., Ltd.	100	Marine transportation of coal ash and fly ash	Chuo-ku, Tokyo
Japan Network Engineering Co., Ltd.	100	Telecommunications business; operation and maintenance of telecommunications facilities	Chuo-ku, Tokyo
Kaihatuhiryou Co., Ltd.	100	Production and sale of fertilizers made using coal ash	Takehara City, Hiroshima Prefecture
J-POWER EnTech, Inc.	100	Engineering relating to equipment for removal of atmospheric and water pollutants	Minato-ku, Tokyo
Bay Side Energy Co., Ltd.	100	Electric power supply	Chuo-ku, Tokyo
Ichihara Power Co., Ltd.	60	Electric power supply	Ichihara-shi, Chiba
ITOIGAWA POWER Inc.	80	Electric power supply	Itoigawa-shi, Niigata Prefecture
J-WIND Co., Ltd.	100	Construction and operation of wind power stations	Chuo-ku, Tokyo
J-Wind IROUZAKI Co., Ltd.	100	Construction and operation of wind power stations	Minami-Izu-cho, Kamo-gun, Shizuoka Prefecture
Green Power TOKIWA Co., Ltd.	100	Construction and operation of wind power stations	Chuo-ku, Tokyo
Green Power Awara Co., Ltd.	100	Construction and operation of wind power stations	Awara-shi, Fukui Prefecture
Green Power Aso Co., Ltd.	88	Construction and operation of wind power stations	Nishihara-mura, Aso-gun, Kumamoto Prefecture
Nagasaki-Shikamachi Wind Power Co., Ltd.	70	Construction and operation of wind power stations	Shikamachi, Kitamatsuura-gun, Nagasaki Prefecture
Nikaho-Kogen Wind Power Co., Ltd.	67	Construction and operation of wind power stations	Nikaho-shi, Akita Prefecture
Omuta Plant Service Co., Ltd.	100	Operation and maintenance of waste-fueled power stations	Omuta City, Fukuoka Prefecture
Miyazaki Wood Pellet Co., Ltd.	98	Manufacture of wood pellet fuel	Kobayashi-shi, Miyazaki Prefecture
J-POWER AUSTRALIA PTY. LTD.	100	Investment in coal mine project in Australia, etc.	Australia
J-POWER Investment Netherlands B. V.	100	Management of overseas investments	Netherlands
J-POWER North America Holdings Co., Ltd.	100	Management of overseas investments	U.S.A.
J-POWER USA Investment Co., Ltd.	100	Management of overseas investments	U.S.A.
J-POWER USA Development Co., Ltd.	100	Research and development and overseas investments	U.S.A.
J-POWER USA Generation GP LLC	100	Management of overseas investments	U.S.A.
J-POWER Holdings (Thailand) Co., Ltd.	100	Management of overseas investments	Thailand
J-POWER Generation (Thailand) Co., Ltd.	100	Overseas investment management, research, development, etc.	Thailand
J-POWER Consulting (CHINA) Co., Ltd.	100	Overseas investment management, research, development, etc.	China

Compliance Code (enforcement January 1, 2010)

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

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.

Business Sites and Companies Receiving ISO 14001 Certification, Etc. (as of March 2012)

In 2002, 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 2012.

Business Sites and Companies Receiving ISO 14001 Certification, Etc.
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 & Architectural Engineering Dept.
J-POWER Environment & Energy Business Dept. (Water Service Business & Infrastructure Engineering Office)
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.

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 FY 1990 is for J-POWER only.

Note: All figures include J-POWER and its consolidated subsidiaries in Japan. Except for the chart for power facilities (peak output), joint ventures have been accounted for based on the percentage ownership.

* The sum of the figures in each column may not equal the total due to rounding.

■ Power Facilities (maximum output)

	Unit	FY 1990	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Hydroelectric	GW	**7.09**	8.56	8.56	8.56	8.56	**8.56**
Thermal	GW	**4.65**	8.18	8.18	8.79	8.79	**8.79**
Coal-fired	GW	**4.64**	7.95	7.95	8.55	8.55	**8.55**
Natural gas	GW		0.22	0.22	0.22	0.22	**0.22**
Geothermal	GW	**0.01**	0.01	0.01	0.02	0.02	**0.02**
Wind power	GW		0.21	0.25	0.27	0.35	**0.35**
Total	GW	**11.74**	16.94	16.99	17.61	17.69	**17.69**

■ Electricity Output

	Unit	FY 1990	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Hydroelectric	GWh	**12,451**	10,428	9,470	10,004	11,301	**11,557**
Thermal	GWh	**29,551**	57,050	53,648	50,742	58,511	**58,522**
Coal-fired	GWh	**29,452**	56,260	52,979	50,224	58,084	**57,624**
Natural gas	GWh		686	589	415	355	**862**
Geothermal	GWh	**99**	104	80	103	72	**36**
Wind power	GWh		321	322	393	458	**590**
Total	GWh	**42,002**	67,799	63,439	61,140	70,271	**70,669**

■ Electric Power Sold

	Unit	FY 1990	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Hydroelectric (excluding pumped storage)	GWh	**10,046**	8,287	8,384	9,214	10,267	**10,318**
Thermal	GWh	**27,293**	53,576	50,122	47,364	54,786	**54,777**
Coal-fired	GWh	**27,206**	52,842	49,505	46,887	54,388	**53,946**
Natural gas	GWh		640	547	383	327	**803**
Geothermal	GWh	**87**	94	70	94	71	**28**
Wind power	GWh		307	310	379	442	**562**
Total	GWh	**37,338**	62,170	58,816	56,957	65,495	**65,657**

■ Fuel Consumption

	Unit	FY 1990	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Coal (dry coal 28 MJ/kg equivalent)	million t	**9.56**	17.91	16.97	16.09	18.51	**18.04**
Use intensity (coal-fired thermal)	t/GWh	**351**	339	343	343	340	**338**
Natural gas	million m^3N		115	99	71	60	**142**
Heavy oil	million kl	**0.10**	0.05	0.04	0.04	0.04	**0.04**
Diesel	million kl	**0.01**	0.03	0.03	0.05	0.03	**0.03**

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

■ Greenhouse Gas Emissions

	Unit	FY 1990	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
CO_2 emissions (domestic and overseas power generation)*1	million t-CO_2	**24.67**	49.86	49.07	46.52	52.54	**52.24**
Intensity	kg-CO_2/kWh	**0.66**	0.70	0.69	0.66	0.67	**0.67**
(domestic power generation)*2	million t-CO_2	**24.67**	46.84	44.35	41.70	47.84	**47.67**
Intensity	kg-CO_2/kWh	**0.66**	0.74	0.74	0.72	0.72	**0.71**
SF_6 emissions	t	–	0.0	0.1	0.0	0.1	**0.1**
Handled	t	–	4.4	7.9	5.9	12.0	**11.1**
Recovery rate	%	–	99	99	99	99	**99**
HFC emissions	t	–	0.1	0.1	0.2	0.1	**0.1**

*1: Based on percentage ownership by J-POWER parent company + consolidated companies (22 in Japan, 24 overseas).
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 the J-POWER parent company and aggregates of figures for consolidated subsidiaries and equity method affiliates for their specific fiscal years, in proportion to our investment ratio.

*2: Based on percentage ownership by J-POWER parent company + consolidated companies (22 in Japan).

Note: Denominators for emission intensity represent electric power sold.

■ Average Thermal Efficiency of Coal-fired Power Stations (at generation point)

	Unit	FY 1990	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Average thermal efficiency (at generation point)	%	**39.0**	40.3	40.1	40.3	40.5	**40.6**

■ Usage of Specified CFCs

		Unit	FY 1990	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Specified CFCs	Stocked	t	**3.6**	1.8	1.7	1.0	1.0	**1.0**
	Consumed	t	**0.7**	0.0	0.0	0.0	0.0	**0.0**
Halons	Stocked	t	**4.7**	4.6	4.6	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**	9.5	9.2	12.6	11.9	**11.4**
	Consumed	t	**0.0**	0.3	0.3	0.1	0.2	**0.2**
HFCs (CFC alternatives)	Stocked	t	–	5.9	10.8	11.3	12.0	**12.0**
	Consumed	t	–	0.1	0.1	0.2	0.1	**0.1**

■ SOx, NOx, and Soot and Dust Emissions

	Unit	FY 1990	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
SOx emissions	1,000 t	**9.9**	11.3	10.6	8.1	10.1	**12.1**
Intensity (thermal)	g/kWh	**0.34**	0.20	0.20	0.16	0.17	**0.21**
NOx emissions	1,000 t	**26.4**	28.5	26.7	22.3	28.0	**28.5**
Intensity (thermal)	g/kWh	**0.90**	0.50	0.50	0.44	0.48	**0.48**
Soot and dust emissions	1,000 t	**1.0**	1.0	0.8	0.6	0.8	**0.7**
Intensity (thermal)	g/kWh	**0.03**	0.02	0.02	0.01	0.01	**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 2007	FY 2008	FY 2009	FY 2010	FY 2011
Volume generated	million t	–	2.18	2.14	2.00	2.34	**2.38**
Volume recycled	million t	–	2.15	2.10	1.96	2.26	**2.33**
Recycle rate	%	–	98	98	98	97	**98**

■ Coal-Ash and Gypsum Recycling

	Unit	FY 1990	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Coal-ash created	1,000 t	**1,257**	1,714	1,747	1,669	1,936	**1,957**
Recycled	1,000 t	**719**	1,711	1,736	1,660	1,900	**1,939**
Recycle rate	%	**57.2**	99.8	99.4	99.4	98.1	**99.0**
Gypsum created	1,000 t	–	360	330	263	320	**362**
Recycle rate	%	**100**	100	100	100	100	**99.8**

Note: For details on coal-ash recycling rate, see p. 73.

■ Office Power Consumption

	Unit	–	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Power consumed by offices (company total)	GWh	–	22.23	21.86	21.07	21.40	**19.41**
Head office* power consumption	GWh	–	8.61	8.61	8.53	8.22	**7.31**
Lighting/power sockets	GWh	–	1.80	1.72	1.71	1.65	**1.25**

* 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 2007	FY 2008	FY 2009	FY 2010	FY 2011
Consumption	kl	–	1,339	1,310	1,348	1,292	1,301

■ Rate of procurement of recycled copy paper

	Unit	–	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Copy paper* purchased	million sheets	–	57.84	56.05	57.17	56.77	**58.77**
Recycled copy paper* purchased	million sheets	–	54.87	55.18	56.79	56.38	**58.14**
Recycled copy paper* purchase rate	%	–	95	98	99	99	**99**

* A4 paper-size equivalent

J-POWER Group Eco Business

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.

Flue Gas Desulfurization-Denitrification System – Regenerative Activated Coke Technology: ReACT –

J-POWER EnTech, Inc.

http://www.jpower.co.jp/entech_e/index.html

ReACT, one of J-POWER EnTech's core technologies, is a flue gas treatment system using activated coke as a medium. The activated coke works as either an adsorbent or a medium to remove multiple pollutants such as sulfur oxides (SOx), nitrogen oxides (NOx), soot, mercury and dioxin from flue gas in one operation, using almost no water. This environmentally friendly technology is widely used in Japan at coal-fired power stations, steel mills, petrochemical facilities, waste incineration plants and other industrial facilities.

The J-POWER Isogo Thermal Power Station New No. 2 Unit has some of the world's cleanest flue gas from a coal-fired power station, and the ability of the ReACT technology to remove sulfur makes a big contribution in part of the unit's exhaust processing facilities.

Additionally, the Wakayama Steel Works of Sumitomo Metal Industries, Ltd. has implemented a compact ReACT system in a very confined space, which has helped to achieve some of the highest denitrification efficiency from sintering flue gas in the steel industry globally and also removes sulfur and dust in one step.

J-POWER has used these results as a steppingstone to expanding our business overseas. In 2009 we entered a technical partnership with Hamon Research-Cottrell, an American major manufacturer of environmental equipment. Because the US regulates mercury in flue gas, there is a growing need for ReACT technology, which can remove mercury at the same time it removes other pollutants, so we expect its usage to grow.

Thus, J-POWER looks forward to supplying such systems in Japan and abroad to help reduce environmental burdens in a wide array of fields.

Flue gas treatment system for Wakayama Steel Works, Sumitomo Metal Industries, Ltd.

Dry-Type Desulfurization-Denitrification facility for J-POWER Isogo Thermal Power Station

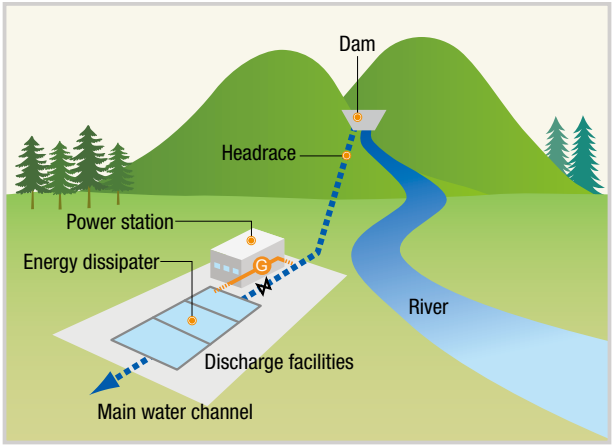
Contributing to a Low-Carbon, Recycling Society by Promoting the Implementation of Small-Scale Hydropower Stations

JP Design Co., Ltd.

http://www.jpde.co.jp (Japanese only)

As a J-POWER Group company, JP Design Co., Ltd. provides engineering services in the fields of civil engineering and construction. As society's demand for renewable energy has grown in recent years, hydropower is expected to play a major role. Under a design contract with the Japan Water Agency, JP Design in FY 2011 performed the execution design of a hydropower station using the service water discharge facilities at Mie Canal's Nakazato Dam. This project can yield an output of up to 140 kW by generating power that would be lost with existing pressure reducing valves. Using hydropower technology it has fostered with J-POWER, JP Design will contribute to energy and the environment for local communities by taking part in the development of small-scale hydropower stations as promoted by the national and local governments.

■ Hydropower station using dam's service water discharge facilities



Viewing the Environment through the Eyes of Living Things

– Flow of Environmental Evaluation Using Biological Indicators –

Ecogenomics, Inc.

http://www.ecogenomics.co.jp/

Based on the concept of "energy and environment," Ecogenomics, Inc. plays a vital role in developing new business fields for J-POWER Group. Seeking "a fusion between the environment and biotechnology," the company uses tools termed "microarrays," formed by mounting a sample of the genetic material of an organism under study on a semiconductor substrate, to test, analyze, and evaluate the effect of various chemical substances, wastewater, water from the environment and other factors on organisms and ecosystems at the genetic level. Ecogenomics is the only company in Japan capable of doing everything from design and production of the environmental evaluation microarrays to actual testing and analysis.

Presently more attention is being given to techniques of evaluating wastewater and so on with bioindicators. Ecogenomics conducts the whole range of such testing with biological organisms.

The company is using environmental biotechnology to ensure that people live harmoniously with nature and to build a truly rich natural environment for all living things.

Environmental evaluation microarray


Microarray production equipment


Biotesting with killifish

Utilizing Coal Ash to Contribute to Agriculture – Potassium Silicate Fertilizer –

Kaihatuhiryou Co., Ltd.

http://www.jpsik.com/ (Japanese only)

Kaihatuhiryou Co., Ltd., a J-POWER Group company, developed the world's first slow-release potassium silicate fertilizer using coal ash from coal-fired power stations. The company began manufacturing the product in 1980 to make more effective use of coal ash. The potassium silicate fertilizer manufactured by the company is sold as a rice farming and garden fertilizer to farmers 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 coal-fired power stations

The use of potassium silicate during rice cultivation improves root growth and helps enhance rice taste.

■ Guaranteed analysis

Citric acid-soluble potassium	Soluble silicate	Citric acid-soluble magnesium	Citric acid-soluble boron
20%	34%	4%	0.1%

*Citric acid-soluble: Describes fertilizer components that are soluble in a 2% citric acid solution. These components do not dissolve in water, but gradually dissolve in acids secreted by roots and in organic acids in the soil, helping to sustain fertilizer effectiveness. Because of this property, potassium silicate fertilizer is eco-friendly, since there is less runoff of its components to rivers and groundwater.

RP-LUCID High-performance Synthetic Lubricant

Planning & Management Office, Thermal Power Engineering Department

RP-LUCID* is a high-performance synthetic lubricant with great oil film strength, long life and excellent water separation thanks to advanced additive technology based on Synerlec, an additive developed by the US firm Royal Purple. RP-LUCID is currently in use in our thermal and wind power stations, as well as other places like cement and paper plants where it has a record of preventing equipment failure, extending intervals between oil changes and otherwise reducing maintenance costs.

The additive Synerlec helps to conserve energy by reducing mechanical loss in sliding parts and cuts total costs (i.e., both maintenance and running costs).

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

RP-LUCID high-performance lubricant

Environmental Accounting Data

Environmental Conservation Costs

(billion yen)

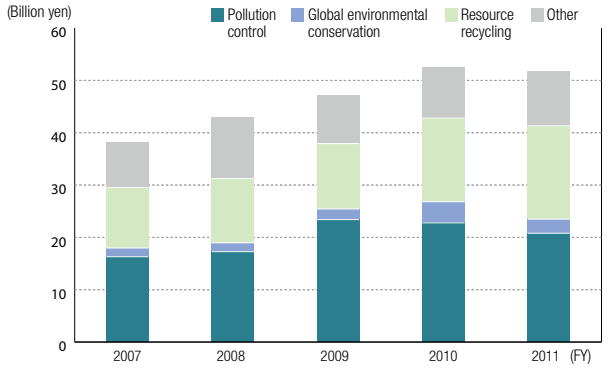
Category	Main measures and efforts	Cost
Pollution control	Air pollution control (desulfurization/ denitrification, soot and dust treatment), water pollution control (waste-water treatment), etc.	20.8
Global environmental conservation	Measures to reduce greenhouse gas emissions (maintaining high-efficiency 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)	2.7
Resource recycling	Waste reduction through reuse and recycling; treatment and disposal of waste	17.8
Management activities	Monitoring and measurement of environmental load, labor costs for environmental conservation organizations, costs for environmental education, etc.	1.9
Research and development	High-efficiency generation, use of fuel cells, CO_2 capture and fixation, recycling of coal ash and gypsum, etc.	2.6
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	1.2
Other	Pollution load levy	2.5
Total		51.7

Environmental Conservation Benefits

Environmental conservation benefit	FY 2011
SOx emissions intensity (g/kWh)	0.21
NOx emissions intensity (g/kWh)	0.48
Soot and dust emissions intensity (g/kWh)	0.01
CO_2 emissions intensity (kg-CO_2/kWh)	0.67
Average thermal efficiency of thermal power generation (%)	40.6
Coal ash recycling rate (%)	99.0
Industrial waste recycling rate (%)	98
Gypsum recycling rate (%)	99.8
Volume of driftwood recycled (1,000 m^3)	23
Employees completing internal environmental auditor training	78
Sustainability report (copies published)	19,700
Environmental pamphlet (copies published)	7,400
Overseas consulting projects (cumulative total)	333

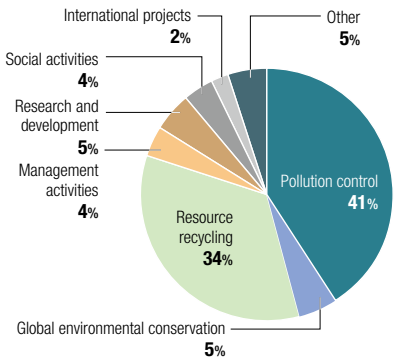
Note: For detailed data on each category, see pp. 87–88, Environment-Related Fiscal Year Data, in the Reference Data section.

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, 2011, to March 31, 2012
- 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 195 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% 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%.
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% 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% 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 2011)

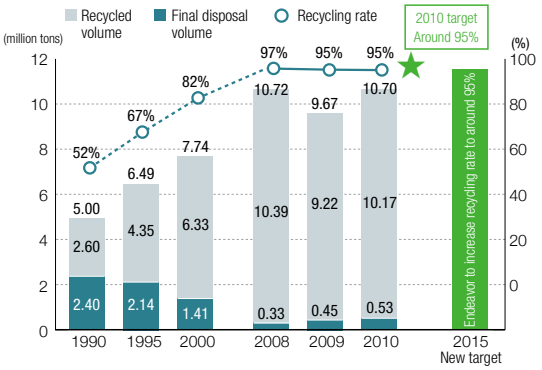
The Environmental Action Plan by the Japanese Electric Utility Industry lays out the electric industry's policy and plan for dealing with global warming and other environmental issues. Each year the plan is reviewed in relation to the industry's progress toward its goals and domestic and international 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 FY 2015, we aim to maintain our waste recycling rate at around 95%.

■ Waste Recycling Rate Target for the Electric Utility Industry



Note: After landfills for final disposal are closed, the land is effectively utilized for the expansion of power generation facilities or for other industrial purposes. A portion of the coal ash used at such sites is counted in "volume recycled" 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 2008	FY 2009	FY 2010
Waste	Combustion residue, dust and soot (coal ash)	Volume generated	3.47	7.80	7.02	7.96
		Recycled volume (Recycling rate)	1.37 (39%)	7.58 (97%)	6.80 (97%)	7.59 (95%)
	Construction waste material	Volume generated	0.40	0.38	0.38	0.40
		Recycled volume (Recycling rate)	0.21 (53%)	0.37 (97%)	0.37 (96%)	0.39 (97%)
	Scrap metal	Volume generated	0.14	0.34	0.23	0.23
		Recycled volume (Recycling rate)	0.13 (93%)	0.34 (100%)	0.23 (99%)	0.23 (99%)
Byproducts	Gypsum from desulfurization process	Volume generated	0.85	1.85	1.57	1.76
		Recycled volume (Recycling rate)	0.85 (100%)	1.85 (100%)	1.57 (100%)	1.76 (100%)

Measures to Mitigate Climate Change

[CO_2 Emissions Suppression Targets]

From FY 2008 to FY 2012, we aim to further reduce CO_2 emissions intensity (emissions per unit of user-end electricity) by an average of approximately 20% to about 0.34 kg-CO_2/kWh from the fiscal 1990 level.

■ Goal of 12 FEPC-Affiliated Companies

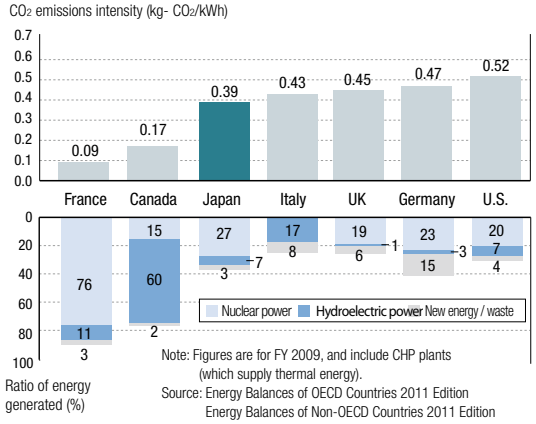
CO_2 emissions ($kg\text{-}CO_2$) = Electric power consumption (electric energy) (kWh) × CO_2 emissions intensity (CO_2 emissions per unit of electric power consumed) ($kg\text{-}CO_2$/kWh)

■ Electric Utility Industry's CO_2 Emissions

Item \ Fiscal year	FY 1990 (results)	FY 2008 (results)	FY 2009 (results)	FY 2010 (results)
Electric power consumption (billion kWh)	659	889	859	906
CO_2 emissions (million t- CO_2)	275	332	301	317
CO_2 emissions intensity of user-end electricity (kg- CO_2/kWh)	0.417	0.373	0.351	0.350

Reference Information

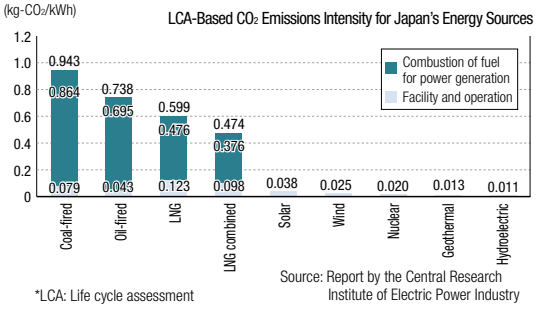
■ Country-by-Country Comparison of CO_2 Emissions Intensity (per unit of energy generated; preliminary calculation by FEPC)



Note: Figures are for FY 2009, and include CHP plants (which supply thermal energy).
Source: Energy Balances of OECD Countries 2011 Edition
Energy Balances of Non-OECD Countries 2011 Edition

■ Comparison of Life Cycle Assessment-Based CO_2 (LCA 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.



*LCA: Life cycle assessment

Source: Report by the Central Research Institute of Electric Power Industry

Glossary

A

Annex I countries
pp. 70, 92

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. 10, 32, 49, 53, 59, 63, 82

Renewable organic resources of plant and animal origin other than fossil fuels.

Baseload power source
p. 9

Electric power demand typically rises in the daytime and decreases in the evening and at night. Because electric power cannot be stored, the power system has to adjust its supply of electric power according to changing demand. A baseload power source is a power source that provides a set volume of electric power stably both day and night. In Japan, coal-fired thermal power is one of the power sources that serve in this function since there is an excellent supply of the fuel and its price is stable.

C

Carbon dioxide capture and storage (CCS)
pp. 10, 14, 49, 56, 62, 82

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. 53

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. 69, 92

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.

D

Designated public institution
p. 21

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. 73, 77

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. 49, 54

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.

Energy security
p. 10

The state of having systems in place to ensure that there is a stable supply of energy from the resource production site to final consumer without being overly affected by political, economic and social conditions, and minimizing risks to such systems. Also referred to as energy supply stability.

Environmental accounting
p. 54

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. 49, 69, 93

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. 50, 78

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

Filtered containment venting system (FCVS)
p. 16

In the event that a major accident causes excessive increase in pressure in a nuclear reactor containment vessel, this system expels the air in the containment vessel to the atmosphere to prevent damage to the vessel, passing the air through a filter to limit the amount of radioactive material released.

G

Green purchasing
p. 74

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.

Gas turbine combined cycle generation
p. 34

A form of power generation which combines gas and steam turbines. The gas turbine is driven by the pressure of exhaust gas produced by burning fuel in compressed air, while the steam turbine is driven by the residual heat of the exhaust gas. The combination of the two realizes high generation efficiency.

H

Hydrofluorocarbons (HFCs)
p. 69

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.

Hydrogen venting equipment
p. 16

In the event of reactor core damage that causes hydrogen to leak into the nuclear reactor building, this equipment quickly and reliably expels the leaked and accumulated hydrogen to the exterior of the building to prevent an internal hydrogen explosion.

I

Independent power producer (IPP)
pp. 3, 4, 25

A business, other than a wholesale power supplier, that supplies electricity to general electric utilities.

Industrial waste
pp. 50, 53, 64, 73

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. 12, 14, 56, 62

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. 12, 14, 49, 56, 61

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. 20

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
Please refer to pp. 70, 92.

Kyoto Protocol
Please refer to p. 92.

L

Lower heating value (LHV)
pp. 10~12, 50

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)
p. 69

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.

N

Nitrogen oxides (NOx)
pp. 10, 42, 50, 53, 57, 72, 89

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)
p. 69

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. 53, 59

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)
p. 69

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)
p. 77

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. 77

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.

Renewable energy
pp. 14, 27, 49, 59, 62, 63, 81

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. 63, 76

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. 10, 53, 72, 89

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. 53

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. 50, 69

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. 10, 42, 50, 53, 57, 72, 89

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, 7, 14, 33, 35~38, 42, 49

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. 10~12, 50, 57

For an electric power generating facility, the ratio of electric power generated (converted to thermal units) to heat energy input.

Thermal water discharge
p. 71

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.

Trial emissions trading scheme
p. 70

A mechanism under which participating enterprises, etc., having set voluntary emissions reduction targets, endeavor to reduce their own emissions, and additionally trade emission caps and credits to achieve those targets.

U

Ultra super critical (USC)
pp. 10, 12, 28, 32, 34, 49, 56, 57

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.

V

Voluntary action plan
p. 70

An environmental action plan voluntarily set primarily by industry groups to encourage environmental protection initiatives in each industry sector, such as helping to curb global warming and reduce waste.

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.

Electric Power Development Co., Ltd.

Environmental Management Promotion Board Office:
Corporate Planning Office, Corporate Planning and Administration Department
15-1, Ginza 6-chome, Chuo-ku, Tokyo 104-8165, JAPAN
Tel: +81-3-3546-2211 Fax: +81-3-3546-9531
E-mail: kikaku@jpower.co.jp
http://www.jpower.co.jp/english/

Reliability Assurance

Inspection/Registration Mark
Indicates that the report has been inspected by a third party organization and satisfies "Sustainability Report Inspection and Registration Mark Conferment Standards."

Paper Considerations

FSC-Certified® Paper
The paper used in this report is made of wood from forests properly managed.

Printing Considerations

Waterless Printing
This report was printed with a waterless printing process creating little waste liquid containing organic matter.

Non-VOC Ink
This report was printed with 100% eco-friendly plant-based ink with no volatile organic compounds.

2012.9