# Efforts Relating to Local Environmental Issues

Through our power-generation activities in various locales, 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.

## Reduction of Environmental Load

To minimize the impact of our activities on air and water quality and other aspects of the local environment, we use the latest technology and know-how at our coal-fired thermal power stations and other facilities to prevent air and water pollution, noise and vibration, and other environmental problems.

### Air Pollution Control

Sulfur oxides (SOx), nitrogen oxides (NOx), and soot and dust are generated as a result of coal combustion at J-POWER's coal-fired thermal power stations. To reduce these emissions we have improved combustion methods and installed flue-gas treatment equipment, including desulfurization and denitrification systems and electrostatic precipitators. Although the performance of equipment varies with its date of installation, at each facility we have used 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.

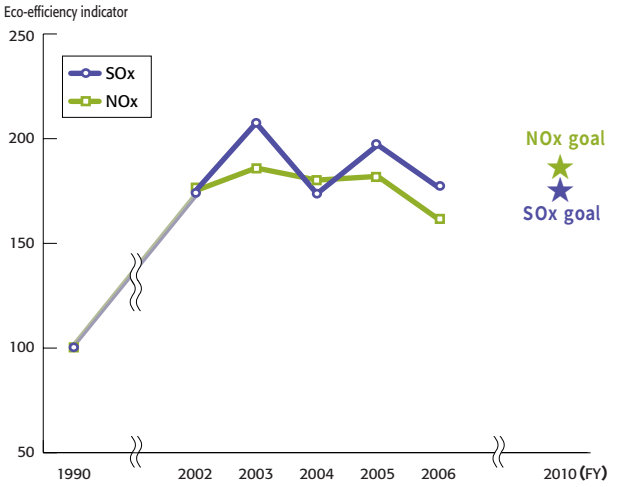
Owing primarily to a drop in the rate of utilization at some of our power stations, J-POWER's SOx and NOx emissions intensity for fiscal 2006 rose from the previous year.

■ **FY 2006 Performance (J-POWER)**

| Substance | Equipment efficiency (removal efficiency) | Emissions | Emissions intensity |
|---|---|---|---|
| SOx | 71%–99.7% | 9,800 tons | 0.20 g/kWh |
| NOx | 65%–88% | 27,800 tons | 0.58 g/kWh |
| Soot and dust | 99% (design value) | 900 tons | 0.02 g/kWh |

Notes: 1. Emissions intensity figures have been calculated using the electric power sold by coal-fired thermal power stations as the denominator.
2. Emissions of soot and dust are calculated on the basis of measurements taken monthly.

■ **J-POWER Eco-efficiency Indicator for SOx and NOx**




Note: For the eco-efficiency indicator, 100 = FY 1990 eco-efficiency (electric power sold ÷ SOx or NOx emissions).

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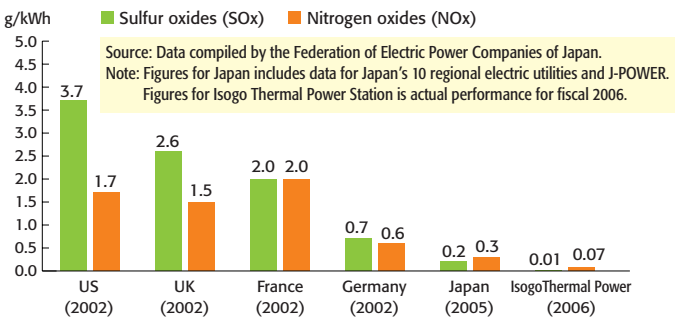
## Emissions Performance at the Isogo Thermal Power Station

Emissions of SOx and NOx per unit of electricity generated by thermal power generation in Japan's electric industry have decreased sharply since the mid-1970s owing to improvements in both fuel and equipment. As a result, today intensity for both substances is a fraction of that found in the other major industrial countries.

The Isogo Thermal Power Station No. 1 Unit has achieved particularly low levels, as indicated by the figure at right, thanks to the adoption of cutting-edge environmental technology.

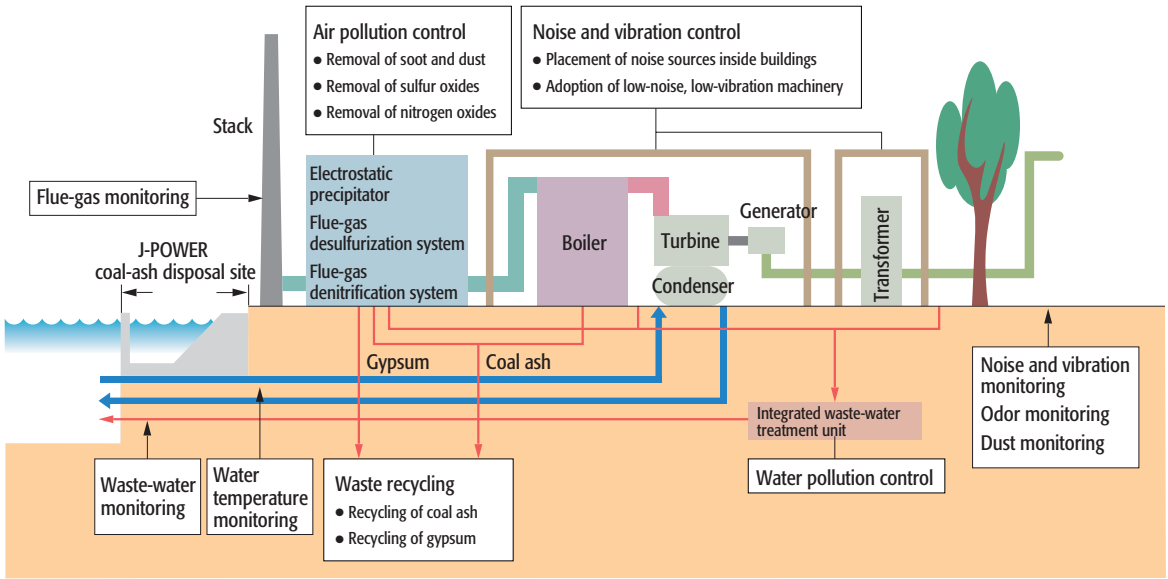
Note: Figures for countries refer to emissions intensity for coal-, oil-, and gas-fired thermal generation combined.

■ **Comparison of SOx and NOx Emissions Intensity for Thermal Power Generation**




Source: Data compiled by the Federation of Electric Power Companies of Japan.
Note: Figures for Japan includes data for Japan's 10 regional electric utilities and J-POWER. Figures for Isogo Thermal Power Station is actual performance for fiscal 2006.

■ **Examples of Environmental Conservation Measures at Coal-Fired Power Stations**




## Water Pollution Control

We install waste-water treatment systems in all our coal-fired power stations and make sure that water discharged from desulfurization units, waste water from offices, and other effluents are appropriately treated.

Metals and organic substances contained in waste water are removed through coagulation, precipitation, filtration, and other methods in each facility's on-site integrated waste-water treatment unit. Treated water is routinely monitored by automatic measuring equipment and analyzed periodically to verify that all substances are well within the regulatory limits established under the Water Pollution Control Law and environmental conservation agreements.

## Noise and Vibration Control

We work hard to prevent undue noise and vibration from boilers, turbines, exhaust fans, and other equipment by installing low-noise, low-vibration machinery in our coal-fired power stations and by keeping such equipment inside buildings. With regard to outdoor equipment at our coal-fired and hydropower stations, in addition to using low-noise low-vibration equipment, we also install soundproof covers and barriers as needed.

Noise and vibration levels are periodically measured at the boundaries of power station sites to ensure that they meet regulatory standards.

## Greening Measures

At our coal-fired power stations, we plant trees (primarily evergreen), grass, and seasonal flowers to cover at least 20% of the site with greenery. These green areas provide habitat for birds, insects, and other small animals.

## Odor Control

Because ammonia is used in such equipment as the denitrification systems of coal-fired thermal power stations, we have put in place rigorous safeguards to ensure that it has no impact on the surrounding area. These include periodic inspection, performance testing, and routine checking of equipment that makes use of ammonia. In addition, care is taken to avoid leakage of ammonia from receiving or storage facilities. Odor levels are periodically measured at the boundaries of power station sites to confirm that they meet regulatory standards.

## Measures against Thermal Water Discharge

Coal-fired power stations intake seawater to cool steam used for power generation and release it as thermal water discharge. To prevent any negative impact on marine life in the vicinity, we control thermal water discharge with intake-discharge processes adapted to the conditions of the plant site. The temperature of thermal water discharge is monitored around the clock to ensure that it remains within the limits established by environmental agreements.

## Measures against Coal Dust

At our coal-fired power stations we implement various measures to prevent the dispersion of dust when coal is handled, including the use of closed conveyor belts and indoor coal storage, as well as wind-shielding and spraying as dictated by topographical and weather conditions.

## Measures at Coal-Ash Disposal Sites

At coal-fired power stations that are equipped with sites for landfill disposal of coal ash, soil is spread over the surface to prevent dispersion of the coal ash. Leachate treatment equipment is used to treat leachate as needed.

## Measures against Soil Pollution

From fiscal 2004 through 2006, we conducted studies at all J-POWER Group domestic sites (370 locations, including thermal power stations, hydroelectric power stations, transmission system facilities, offices, and company-owned housing) and determined that all sites were free of soil or groundwater contamination. We will continue working hard to ensure that such pollution does not occur in the future.

## Management of Chemical Substances

Storage and management of chemicals and other substances 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-management program.

### PRTR (Pollutant Release and Transfer Register) Law

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 procured and used. We are committed to minimizing 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 correct management and oversight of facilities.

### Measures to Reduce Dioxins

The J-POWER Group operates incinerators ("specified facilities" under the Law Concerning Special Measures against Dioxins) at three business sites for such purposes as carbonizing driftwood. At these facilities we implement appropriate maintenance and management procedures, such as sorting prior to treatment and combustion temperature control. Under the above-mentioned law, incineration facilities must monitor the concentration of dioxin in flue gas at least once a year and report it to the local government. In fiscal 2006, all our incinerators met emissions standards.

### Management and Treatment of PCBs

PCBs have been widely used as insulators 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 Law Concerning Special Measures Against PCB Waste came into force, and appropriate treatment of waste containing PCBs became mandatory.

The J-POWER Group began treatment of these substances under the regional waste-management program in February 2005, and as of March 2007 we had treated approximately 3 kl of insulating oil (containing high concentrations of PCBs). We currently have approximately 136 kl of insulating oil (as of March 2007). This is stored and managed under stringent conditions in 29 warehouses and similar facilities that we have established nationwide.

### Trace PCB Contamination

In July 2002, the Japanese government announced that extremely low levels of PCBs (under 5.0 ppm in about 60% of the cases) had been detected in products that had been accidentally contaminated by heavy electrical machinery following the prohibition on PCB use. We are diligent in enforcing stringent management procedures for machinery that uses insulating oil in which PCBs have been detected and in submitting the paperwork required by the relevant laws and regulations. Meanwhile, a national commission has investigated the causes of the contamination and will be deliberating measures for treating PCB-contaminated material. We will continue to respond to this issue in a conscientious and appropriate manner.

### Asbestos

The J-POWER Group has adopted a policy for dealing with asbestos, under which we have conducted health checks and surveys of asbestos use in our equipment and buildings and undertaken appropriate countermeasures. According to the results of our surveys, there are no active or retired J-POWER Group employees who have been designated eligible for workers' compensation for health problems or death from asbestos, or who are in the process of applying for such compensation.

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 Law.

■ **Total PRTR-Substance Release and Transfer Volumes (FY 2006)**

| Chemical | Use | Volume handled | Volume released | Volume transferred as waste |
|---|---|---|---|---|
| 26: Asbestos | Insulation material | 0.7 t/y | – | 730 kg/y |
| 63: Xylene | Coating for machinery and equipment | 9.8 t/y | 2,700 kg/y | – |
| 177: Styrene | Coating for machinery and equipment | 1.6 t/y | 1,600 kg/y | – |
| 179: Dioxins | Waste incinerators | – | $8.9 \times 10^{-8}$ mg-TEQ/y | $2.9 \times 10^{-4}$ mg-TEQ/y |
| 253: Hydrazine | Chemical for feed-water treatment | 1.8 t/y | – | – |
| 307: Poly (oxyethylene) alkyl ether | Prevention of coal-ash dispersal (in conveyors) | 6.9 t/y | | 6,900 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.

## Efforts to Protect the Natural Environment and Biodiversity

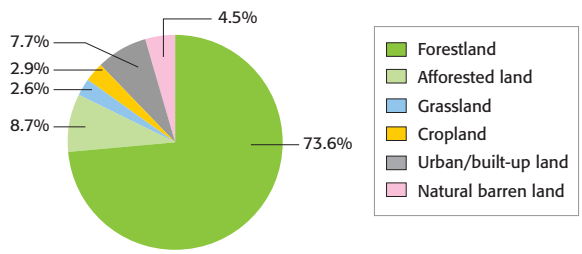
When planning a new power station or other construction, the J-POWER Group carries out environmental impact assessments and strives to minimize the impact on the environment, incorporating the views of local residents in our planning. During construction, we implement environmental measures and carry out monitoring toward the goal of coexisting harmoniously with the environment. In addition, we work to preserve the natural environment and biodiversity of the area in our operation and maintenance of the facility.

### Efforts to Preserve Our Forests

J-POWER owns approximately 4,600 hectares of forest land around the country, primarily in the vicinity of our 59 domestic hydroelectric power facilities. In fiscal 2006, we used aerial photography to carry out a vegetation survey of all company land (excluding thermal power stations, etc.). The survey determined that about 90% of company-owned land is wooded land with a high degree of natural vegetation—either natural forest or wooded land close to natural forest. Furthermore, the ratio of forestland within J-POWER's company-owned natural lands (dry land excluding the flooded area of reservoirs) is 74% (see diagram below), roughly equivalent to that of Japan's natural parks (69%) or quasi-national parks (61%).

As this indicates, J-POWER's natural lands are generally wooded lands, of which the bulk is relatively close to its natural state. It can be inferred that these are areas with a high degree of biodiversity, and we intend to work to preserve them.

■ Land Cover Breakdown of Company-Owned Land




### Harmonious Coexistence with Rare Species

At J-POWER Group we are aware of the need to preserve biodiversity, and are working to ensure that our construction and operation of facilities do not threaten rare species.

#### ● Japanese Golden Eagle

The Japanese golden eagle, ranked as "endangered IB" in the Environment Ministry's Red Data Book, inhabits the area around Okutadami Dam and Otori Dam.

In the maintenance and operation of these dams, we are doing our utmost to avoid outdoor work during the Japanese golden eagle's nesting season.

If eagle nesting activity is confirmed among the eagles that have been determined to nest near the dam, and if work needs to be carried out in the vicinity, we take precautions to minimize the number of vehicles and the noise level, taking into account the advice of local ornithologists, so as to minimize the impact on nesting activity.

Young Japanese gold eagle
(photographed July 18, 2000)

#### ● Blakiston's Fish-owl

Among the inhabitants of the Tokachi district of Hokkaido Prefecture is Blakiston's fish-owl, ranked as "endangered IA" in the Japanese Environment Ministry's Red Data Book.

We are taking care to plan and carry out work in the area during times other than the nesting season to minimize the impact on the owl population.

Blakiston's fish owl
(Photo: Kushiro Zoo)

#### ● Northern Japanese Macaque and Other Rare Species

Ohma Main Transmission Line, now under construction, will extend 61 km, stretching from the Ohma Nuclear Power Station (Ohma-machi), scheduled to be built in Shimokita-gun, Aomori Prefecture, to Tohoku Electric Power Company's Higashidori Nuclear Power Station (Higashidori Village). During construction of the transmission line, it has been determined that the area bordering the planned route is a rich natural environment populated by various rare species of wildlife.

Among these is the northern Japanese macaque, designated a protected species. Since 1997 we have been soliciting the opinions of experts and incorporating the results in measures implemented during construction to keep the impact of power-line construction on Japanese macaques to an absolute minimum.

In addition to Japanese macaques, the area around the planned route is known to be home to a number of endangered birds, including the northern goshawk and the mountain hawk-eagle. As with the Japanese macaque, we are taking precautions to minimize the impact on the

growth and development of these rare bird species.

Northern Japanese macaque (April 18, 1999)

### Wetland Restoration

Plans connected with the Okutadami-Otori Hydro Power Expansion Project (Fukushima and Niigata prefectures), called for rock generated during excavation to be used to fill in land on the left bank downstream of the Okutadami Dam. However, the area to be filled hosted an ecosystem that depended on wetlands within a mountain environment. The solution arrived at was to create another wetland to substitute for the area to be filled in so that the plan could go forward while preserving the wetland ecology. To preserve the wetland, meticulous attention was paid, allowing the original wetland environment and the substitute environment to exist side by side for as long as possible, transplanting flora carefully, and encouraging wildlife to migrate naturally. In fiscal 2005, this project received the Japan Society of Civil Engineers Environment Award.

Since then, we have confirmed the continuous presence of precious dragonfly species in the restored wetland area and the newly created pond downstream from it. In fiscal 2007, we plan to carry out a survey to determine changes in the flora and fauna since the pond was created.

Pond Oike created next to the substitute wetland

Sign explaining the substitute wetland

## Hydroelectric Power and Harmony with the River Environment

### Reservoir Water Quality Management

Typhoons or torrential rains can send large amounts of muddy water flowing into dam reservoirs, where it builds up. The release of water for power generation purposes can then lead to prolonged river turbidity.

For this reason, we are constantly monitoring the water quality of reservoirs by making measurements using turbidimeters and carrying out water quality analyses on water samples. In this way we are able to discharge turbid water quickly or, at dams where turbidity threatens to become chronic, implement appropriate countermeasures, such as installation of surface-water intake systems that enable the intake of the relatively clear water at the surface.

At sites where the problem of turbid water is severe, we are taking preventive measures by cooperating with the national and prefectural governments in forest management and afforestation programs.

### Control of Reservoir Sediment

Each year large quantities of earth flow into dams from upstream and are deposited there as sediment. To avoid damage from flooding when rains cause the water level to rise, we control sediment by dredging to remove it or move it to another area of the reservoir.

### River Maintenance Discharge

Downstream from power station dams, river flow falls off between the dam and the generator outlet. For this reason, we carry out river maintenance flow discharge, in consultation with the Ministry of Land, Infrastructure and Transport and other relevant agencies, to preserve a normal flow of the river. As of the end of fiscal 2006, such measures were being implemented at 30 power stations over 527 km of river.

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## Wakamatsu Research Institute Award from the Ministry of Environment

As one of our efforts oriented to biodiversity, Wakamatsu Research Institute (Fukuoka Prefecture) has equipped its service buildings with rooftop gardens with the aim of creating a biotope network that connects with the adjoining natural environment, such as mountain forests. Another goal is to give these areas the function of "classrooms" for the kind of energy and environmental education to which J-POWER Group is committed, by using natural energy such as wind and solar power. The rooftop garden facilities of the Wakamatsu Research Institute, together with those of the Wakamatsu Environmental Research Center of JPec in charge of construction and management received the Minister of Environment Prize of the first prize for Rooftop Greening Technology of the fifth annual Competition for Specialized Greening Technology for Rooftops, Wall Facings and New Green Spaces sponsored by the Organization for Landscape and Urban Green Technology Development.

Rooftop garden at the J-POWER Wakamatsu Research Institute

## Environmental Assessment and Monitoring

The J-POWER Group carries out environmental assessments (environmental impact assessments) when planning for the construction of a new power station or the expansion of an existing one. We make a survey of the current state of the area's natural environment (air quality, water quality, soil quality, ecology, etc.) and social environment (industry, land use, traffic, etc.) and predict the impact that the siting of a power station will have on the surrounding area. During the process, we listen to the views of local residents and incorporate them in our plan.

After a power station starts operating, we continue monitoring the environment for a certain period of time to ensure that the impact on the environment falls within the parameters of our predictive assessment.

### ● Environmental Conservation Measures during Preparatory Works of Ohma Nuclear Power Station

The J-POWER Group is taking appropriate measures to protect the environment in carrying out preparatory works of Ohma Nuclear Power Station as outlined in the Ohma Nuclear Power Station Environmental Impact Assessment. We have also adopted an environmental management system (EMS) and are proceeding with measures to protect, improve, and enhance the environment.


Survey of rare species

In addition, since preparatory construction work began in April 2000, we have been monitoring air quality, noise, vibration, and water quality. We are also conducting a status survey of rare species inhabiting the area around the site of the planned power station.

The results of the survey are made available for public inspection along with the results of our coastal water quality survey.

### ● Environmental Measures during Construction of the Isogo New No. 2 Unit

The J-POWER Group is taking appropriate measures to protect the environment during construction of the new No. 2 unit of the Isogo Thermal Power Station as outlined in the Environmental Impact Assessment for the Isogo Thermal Power Station (New No.1 and No. 2 Units) Renewal Plan. We have also adopted an environmental management system (EMS), under which we are working to protect, improve, and enhance the environment.

In addition, we are carrying out environmental monitoring of air quality, noise, vibration, and water quality, including coastal waters, in accordance with our Plan for Follow-up Study in Connection with the Isogo Thermal Power Station (New No. 1 and No. 2 Units) Renewal Plan.

Finally, to ensure that J-POWER Group's policies for protecting the environment are correctly transmitted to our construction contractors, we have prepared a Contractor's Manual, which contractors are required to follow. We also provide environmental education periodically.

■ **Ohma Nuclear Power Station Environmental Measures**

| Focus of measures | | Content |
|---|---|---|
| Protection of terrestrial animals and vegetation | | • Preserving about 30% of site unaltered to protect rare species, etc.<br>• Protecting small animals' migratory paths by constructing crossing tunnels under roads and gently sloping ditches along roads to allow animals to climb out |
| During construction | Water pollution | • Installing silt protectors in coastal waters and monitoring water quality<br>• Neutralizing the chemical effects of concrete emplacements in seawater<br>• Channeling runoff into temporary settling ponds at construction sites and releasing clear supernatant water |
| | Noise/vibration | • Selecting low-noise, low-vibration machinery<br>• Implementing anti-noise/vibration measures as necessary |
| | Disposal/handling of loose earth and rock during construction | • Using loose earth and rock generated by excavation and dredging for reclamation, backfill, and embankments; using surplus earth from construction to build a mound on an on-site disposal area that is incrementally greened |
| | Dust | • Installing washing facilities for construction vehicles<br>• Spraying and cleaning construction roads<br>• Installing anti-dust barriers and nets |
| | Traffic noise | • Designating routes for construction vehicles<br>• Reducing road traffic through use of marine transport |
| | Industrial waste | • Disposing of waste appropriately in compliance with law<br>• Chipping and recycling cleared timber and roots as mulch, etc. for greening of site |

■ **Isogo New No. 2 Unit Environmental Measures**

| Focus of measures | Content |
|---|---|
| Air pollution | • Evenly distributing construction work over work period to avoid concentrated emissions from construction equipment and vessels<br>• Conducting periodic inspections of construction equipment and vessels |
| Water pollution | • Using silt protectors to prevent dispersion of pollution and monitoring water quality during offshore construction<br>• Treating construction waste water and rainfall runoff during construction in temporary waste-water treatment facilities, monitoring water quality with continuous measuring equipment and conducting water quality checks by manual analysis when water is discharged<br>• Using integrated waste-water treatment facilities to treat effluent such as that from cleaning of equipment during test operation of the power station |
| Soil contamination | • Refraining from use of substances that can cause soil contamination |
| Noise/vibration | • Using low-noise and low-vibration equipment<br>• Measuring noise and vibration and taking remedial steps |
| Ground subsidence | • Refraining from pumping of groundwater<br>• Periodically measuring ground level |
| Handling/disposal of earth and rock generated during excavation, dredging | • Using excavated earth and rock for backfill and landscaping at power station site<br>• Spraying to prevent dust<br>• Disposing of dredged soil appropriately in consultation with relevant authority |

## Recycling and Reuse of Resources

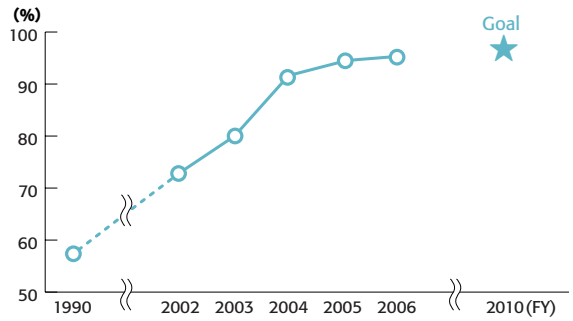
To help build a recycling-based society, the J-POWER Group is working hard to reduce the waste we generate and to properly treat and recycle the waste we do produce. We are also involved in a number of recycling programs that promote environmental conservation measures, the use of untapped energy sources, and so forth.

### Effective Use and Reduction of Waste

In fiscal 2006, the J-POWER Group generated 1.96 million tons of industrial waste, of which recycled or reused resources totaled 1.86 million tons, or 95%.

Henceforth we intend to promote more extensive recycling of coal ash and reduction of industrial waste generated from maintenance and operation of power stations to "achieve a recycling rate of 97% within the J-POWER Group as a whole by the end of fiscal 2010, with the goal of zero emissions of industrial waste."

■ **Industrial Waste Recycling Rate**



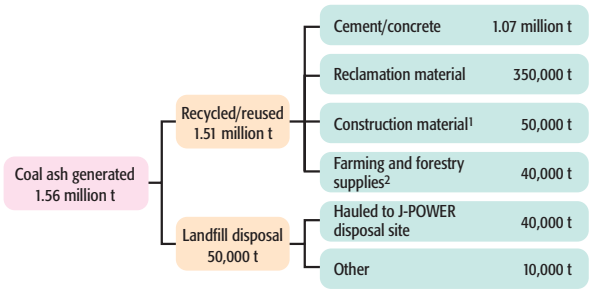

Note: The figure for FY 1990 represents J-POWER's recycling rate for coal ash only; figures for FY 2002–FY 2003 are the rate for all industrial waste produced by J-POWER; and the FY 2004–FY 2006 and goal figures represent the recycling rate for all industrial waste generated by all companies of the J-POWER Group.

### Effective Use of Coal Ash

Coal ash, the residue from the combustion of coal at coal-fired power stations, accounts for the largest volume of waste we produce. In fiscal 2006, we generated 1.56 million tons of coal ash, of which we recycled or reused 1.51 million tons, or 97% (see graph at right).

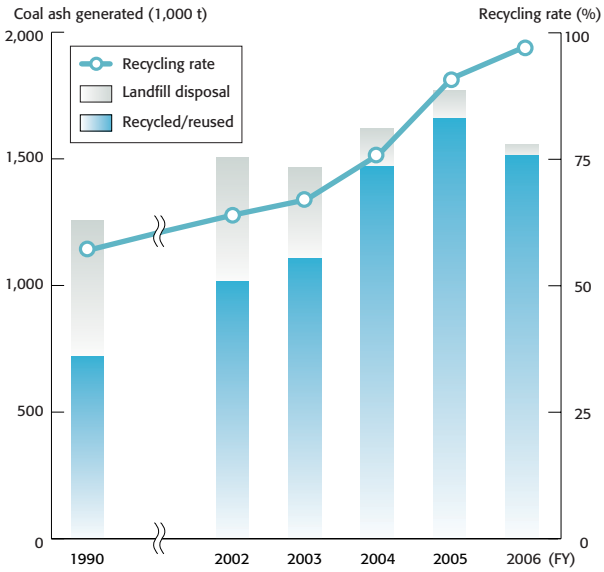
Recycled coal ash is used in such areas as land reclamation materials, construction materials, and farming and forestry supplies. The bulk of it is recycled as raw material for cement or concrete admixture. In the field of agriculture and forestry supplies, we sell potassium silicate fertilizer manufactured from recycled coal ash at a fertilizer plant operated by a J-POWER Group company. Most of the coal ash that cannot be recycled or reused is disposed of in landfill at our own disposal sites.

■ **Breakdown of Coal-Ash Recycling (FY 2006)**




Notes: 1. Primarily facing and filling material
2. Potassium silicate fertilizer, etc.

■ **Trends in Coal-Ash Recycling**




### Fertilizer Made Primarily from Coal Ash

The J-POWER Group (JPec Co.) has developed the world's first potassium silicate fertilizer soluble in citric acid, made primarily from coal dust generated at coal-fired thermal power stations, and is marketing it nationwide.

## Effective Use of Gypsum

Gypsum is generated as a by-product of wet-type flue-gas desulfurization systems at coal-fired power stations. We recycle all of this gypsum in the form of gypsum board and raw material for cement. In fiscal 2006, we generated approximately 330,000 tons of gypsum, and we maintained a recycling rate of 100%.

## Office Recycling Efforts

We are working hard to reduce municipal solid waste by such measures as sorting waste paper, bottles, cans, and plastics, using both sides of copier paper, and reusing envelopes.

With regard to waste paper and other refuse from the J-POWER head office, employees have familiarized themselves with and implemented a new waste-sorting policy based on the main office's EMS. As a result of such efforts the amount of municipal solid waste, including paper, generated by the head office in fiscal 2006 was approximately 30 tons.

Finally, the J-POWER Group as a whole has adopted the goal of achieving an 85% paper recycling rate by fiscal 2010 (a year-on-year increase of at least 1%), and we intend to promote our efforts at resource conservation henceforth.

## Effective Use of Construction By-products

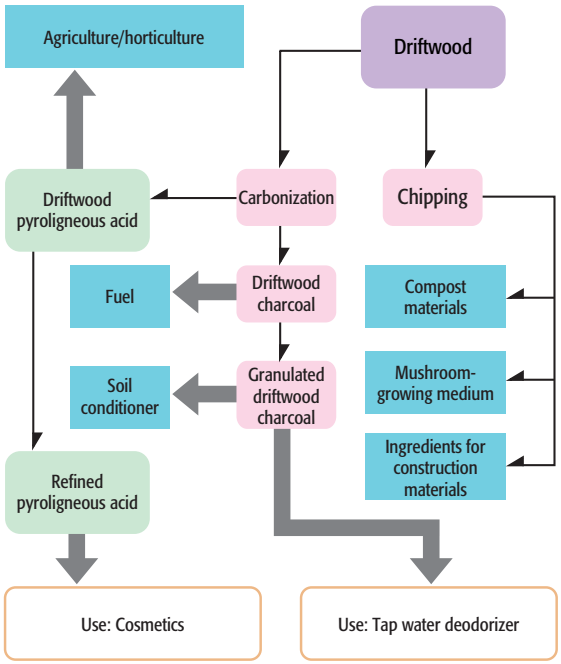
We work with contractors and others to promote effective use of the by-products of new construction, expansion, and renovation of electric power facilities by a variety of means, including the recycling of concrete scrap and cleared trees and the use of loose earth generated during construction within the grounds of the facility.

## Effective Use of Driftwood

We voluntarily retrieve driftwood that collects in dam reservoirs at our hydroelectric power stations and recycle it by manufacturing charcoal, extracting pyroligneous acid, or chipping the wood for use as building materials and mulch. In fiscal 2006, some 16,800 m³ of driftwood was recycled.

Driftwood collecting in a dam reservoir (Sakuma Dam, Shizuoka Prefecture)

■ **Effective Use of Driftwood**



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## Hibikinada Greenfarm: A Tomato-Growing Facility Springs from Coal-Ash Landfill

Coal ash has been put to effective use as landfill for the Hibikinada district reclamation project in Wakamatsu Ward, Kitakyushu, Fukuoka Prefecture. J-POWER and Kagome Inc. are partnering in a tomato-growing operation using the reclaimed land in Kitakyushu, a business that was established in Japan's "Special Zone for Structural Reform."

On March 31, 2006, construction was completed on one large-scale, high-tech greenhouse featuring automatic control of temperature, humidity, and watering, and the first tomato shipments began the following July. Completion of second greenhouse, scheduled for August 2007, will bring the total greenhouse area to 8.5 hectares and give the operation the production capacity to ship about 2,500 tons of tomatoes annually.

The shells are made of a special, highly light-permeable film to enhance the greenhouse effect, and the greenhouses are also with earth-friendly features, including a system for capturing $CO_2$ generated by the heating system and so that it can be used by the tomato plants in photosynthesis.

## Environmental Recycling Program

The J-POWER Group's environmental recycling program comprises the promotion of appropriate treatment of waste, environmental measures, and the use of untapped energy sources. We are utilizing PFI/PPP* schemes in environmental recycling projects that have been launched.

* PFI (Private Finance Initiative) and PPP (Public-Private Partnership) are schemes that take advantage of private funds, management know-how, and technical expertise in the design, construction, maintenance, and operation of public facilities or projects.

### PFI Waste-Power Generation Projects

#### ● Omuta Recycle Power Station

J-POWER Group has a stake in an RDF (refuse-derived fuel)* power station, which is the most efficient waste power station ever built, and it supports the operation and maintenance of this power station.

Omuta, Fukuoka Prefecture; startup December 2002

* RDF (refuse-derived fuel): a pelletized fuel derived from municipal solid waste

#### ● Narumi Waste Gasification Plant, Nagoya

J-POWER also has a stake in this municipal solid waste (MSW) gasification power station that makes use of cokes bed. The slag produced is recycled as material.

Nagoya, Aichi Prefecture; startup (planned) July 2009

### Demonstration Trials of MSW Carbonization

Municipal solid waste contains biomass resources, and its utilization as an energy source is anticipated.

In the J-POWER Group, we are developing a technology for producing carbonized fuel from MSW. Currently we are involved in a NEDO (New Energy and Industrial Technology Development Organization) project scheme for a field test of biomass and other untapped energy sources in collaboration with the city of Saikai in Nagasaki Prefecture. As a more effective use of biomass, we are conducting research on the use of carbonized fuel derived from MSW as fuel in coal-fired power generation, as well as on the technology of producing carbonized fuel. Beginning in March 2006, test production of carbonized fuel was launched at the demonstration test facility at the Matsushima Thermal Power Station, and in fiscal 2006 about 20 tons of carbonized fuel was produced from approximately 90 tons of combustible MSW.

Test facility for manufacture of carbonized fuel from MSW

| Examples of PFI/PPP Environmental Recycling Projects |
|---|
| Kanda Eco Plant Project |
| Samukawa Water Purification Plant Waste-Water Treatment PFI Project |
| Edogawa Water Purification Plant Waste-Water Treatment Facility Construction and Operation PFI Project |
| PFI consulting services for local governments |
| **Examples of Other Efforts Relating to Environmental Recycling** |
| Utilization of sewage sludge (biosolid) fuels (co-combustion) |
| Development of technology for production of carbonized fuel from sludge |

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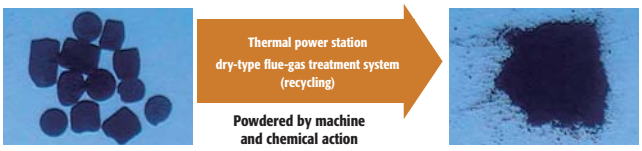
### EPO-COAL: Recycled Granulated Coke Powder for Dioxin Removal

The powdered dioxin remover EPO-COAL for waste incinerators is made from activated coke powder produced in and shipped from the dry-type flue-gas desulfurization unit at J-POWER's Isogo Thermal Power Station new No. 1 Unit and the dry-type flue-gas denitrification unit at Takehara Thermal Power Station No. 2 Unit.

EPO-COAL has received high marks thus far. Its carbon load during manufacturing is close to zero, unlike that of commercially available activated charcoal products, and it has been found to be the equal of such products in performance tests for the dioxin removal in conventional incinerators.

In fiscal 2005, EPO-COAL was registered as a Hiroshima Prefecture Recycled Product (product of Takehara Thermal Power Station). It has also been adopted by a waste-disposal consortium in the Kyushu area. We will continue to actively market and promote the use of EPO-COAL, not only to cut back on waste and increase the recycling rate within the J-POWER Group but also to contribute to the building of a recycling-based society in Japan's local communities.




Dry-type flue-gas treatment (activated coke pellets)

EPO-COAL (activated coke powder)

## Environmental Measures in the International Power Business

The J-POWER Group is applying the environmental technology it has nurtured in its domestic power generation business and transferring that technology overseas as it expands its operations. Through our international consulting work we conduct environmental impact assessments, transfer of desulfurization and denitrification technology, and similar activities. In our IPP projects as well, we apply our environmental engineering know-how to the biomass plants, hydropower, gas-turbine combined-cycle, and other facilities.

### Power Generation Services Worldwide

Our international power business, centered on international consulting, has earned high marks and confidence since it was launched more than 40 years ago, at the beginning of the 1960s. Based on the technology and experience we have accumulated here in Japan, we have served as a technical adviser to overseas organizations or institutions on feasibility studies, design, and construction supervision of power generation stations. We also send JICA experts to agencies in the host countries and invite engineers from developing countries to train with us.

As of the end of fiscal 2006, we had been involved in a total of 277 international consulting projects in 61 countries.

We established the IPP Business Office in 1997 and subsequently redoubled our efforts in this area with a view to making the international IPP business our second important revenue source. As of the end of fiscal 2006, we were involved in 17 overseas power generation projects (15 of which have begun commercial operation) in seven countries and territories.

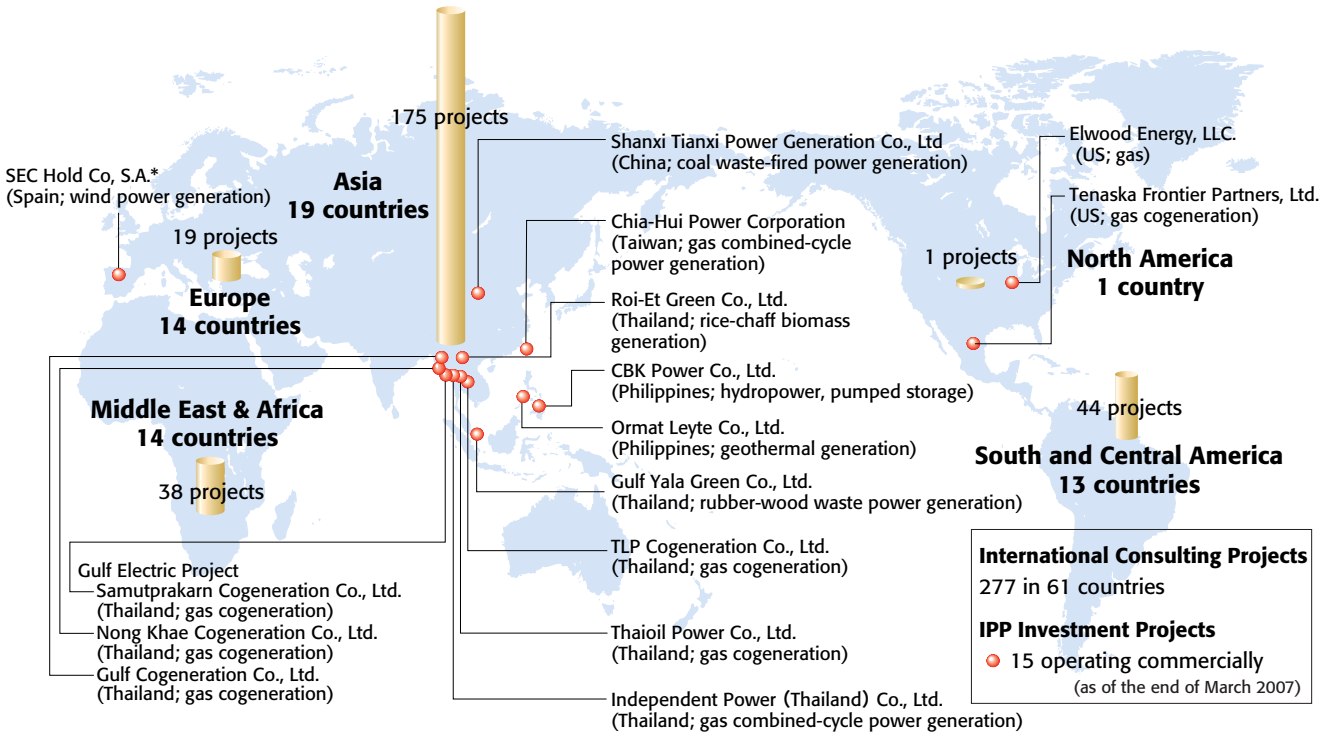
### International Consulting

For many years we have been making use of the technologies nurtured in our domestic hydropower operations to assist countries around the world in developing hydropower—a renewable energy source—through such means as supervision of construction projects.

Examples of environmental technology consulting in the area of coal-fired thermal power are the transfer of SOx and NOx emissions reduction technology to countries of the European Union, technological advice on measures to reduce SOx emissions to East European countries plagued by acid rain, and in China, a demonstration test of technology to desulfurize coal with high sulfur content (commissioned by METI).

In connection with the Rehabilitation Project for the Fourth Thermal Power Plant in Ulaanbaatar (540MW, funded by a Japanese ODA loan), we have been involved as consultants since 1995 in a plan to renovate an existing thermal power station that had become difficult to maintain

■ International Consulting and IPP Investment Projects




* SEC Hold Co., SA, a wind-power power generation company in Spain, was sold on June 15, 2007.

■ **Major Recent Consulting Projects**

| Project type | Name | Country | Duration | Description |
|---|---|---|---|---|
| Thermal | Rehabilitation Project for the Fourth Thermal Power Plant in Ulaanbaatar | Mongolia | Nov. 2001 – Oct. 2006 | Supervision of construction for high-efficiency rehabilitation of thermal power station |
| Thermal | Tashkent Thermal Power Plant Modernization Project | Uzbekistan | Jan. 2005 – Dec. 2009 | Support in bidding process and supervision of construction of high-efficiency gas cogeneration thermal power station |
| Hydropower | Purulia Pumped-Storage Hydropower Project | India | Jul. 2003 – Feb. 2008 | Detailed design and construction supervision of dam and power station |
| Hydropower | Upper Kotmale Hydropower Project | Sri Lanka | Nov. 2003 – Nov. 2009 | Bidding support and construction supervision |
| Power transmission | Transmission and Distribution Development Project in Paraguay's Metropolitan Area | Paraguay | Aug. 1996 – Sept. 2006 | Detailed plan and supervision of construction of metropolitan power grid |
| Power transmission | Cebu-Negros-Panay Interconnection Uprating Project | Philippines | Jul. 2004 – Sept. 2006 | Detailed plan and supervision of construction project linking small islands with underwater cable |
| Water works | Zletovica Basin Water Utilization Improvement Project | Macedonia | Mar. 2005 – Aug. 2010 | Detailed plan and construction supervision of multipurpose system to improve water supply |
| Solar power | Demonstration Research on Dispersed Power Generation System Technologies: Photovoltaic, Wind Power, and Advanced Storage Batteries | China | Oct. 2003 – May 2006 | Demonstration test of wind power, new storage battery, and minigrid |
| Heat supply | Study for a District Heating and Cooling System in Shanghai | China | Sept. 2006 – Mar. 2007 | Compilation of guidelines for promoting the adoption of a district heating and cooling system |

after the collapse of the Soviet Union. Since 2001 we have been involved in work to refurbish the plant's boiler burners (Phase 2), which is expected to improve the boiler thermal efficiency, and we have also held technology transfer seminars concerning plant operation and maintenance as well as on-the-job-training, which should contribute to operational improvements. Having completed the repairs and upgrades in December 2006, we are devoting the two-year guarantee period to confirmation operation (through December 2008).

Rehabilitation Project for the Fourth Thermal Power Plant in Ulaanbaatar (Mongolia)

## International IPP Investment Program

Responding to the worldwide trend toward privatization and deregulation of the electric power industry, we are involved in a wide range of businesses overseas. At the same time, we are applying domestically developed technologies connected with high-efficiency thermal power generation and environmental conservation in order to achieve environmentally sustainable economic growth. As of the end of fiscal 2006, we were involved in IPP projects in 7 countries and territories, operating 15 power generation facilities and involved in plans for 2 others.

In Thailand, where we are involved in 9 projects (one under construction), fiscal 2006 saw the startup of the Yala Biomass Power Station, which uses waste from rubber-wood sawmills as fuel. This is our second successful biomass power project in Thailand, following the Roi-Et Rice Chaff Thermal Power Station. Through these projects we are contributing to the effective use of untapped resources and $CO_2$ emissions reduction.

Yala Biomass Power Station (Thailand)

## Future Business Development and Our Contribution to Sustainable Development

In our international consulting business, while remaining focused on electric power projects using ODA, we plan to branch out into new areas, such as water supply and irrigation, where we can apply our technological know-how. We are also expanding our business operations to non-ODA areas, such as private development projects. In our IPP business, we will continue to strive for more environmentally friendly business.

We believe that through overseas technology transfers in our consulting and IPP business, we can contribute to global sustainable development in the future.

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### International Wind Power Projects

In January 2007, J-POWER joined Mitsui & Co., Ltd. and WFL Windfarmer AG of Switzerland in establishing a joint venture, Zajaczkowo Windfarm Sp.zo.o., marking the first time that a Japanese company has participated in a wind power project in Poland. We are currently at work on the construction of a 48,000 kW-capacity wind power station (24 generators, 2,000 kW each) in Zajaczkowo in northern Poland, with an eye to launching commercial operation in 2008. J-POWER is actively pursuing wind power projects in Poland and other countries of Central and Eastern Europe, as well as other regions around the world.