



Toward a Sustainable Environment

Tomamae Winvilla Wind Farm (Hokkaido)

■ Environmental Management

- 21 Environmental Management Vision
- 23 Business Activities and the Environment (FY 2005)
- 25 Environmental Accounting and Efficiency

■ J-POWER and the Environment

Efforts to Combat Climate Change

- 27 CO₂ Emissions
- 28 Maintaining and Improving Efficiency of Energy Use
- 31 Developing Low-CO₂-Emission Power Sources
- 33 Utilization of Kyoto Mechanisms and Other Approaches
- 35 Developing, Transferring, and Disseminating New Technologies
- 36 Reducing Emissions of Gases Other than CO₂

Efforts Relating to the Local Environment

- 37 Reducing the Environmental Load
- 39 Recycling and Reuse of Resources
- 42 Management of Chemical Substances
- 43 Steps to Protect the Natural Environment and Biodiversity
- 47 Environmental Measures in the International Power Business
- 49 Pursuing Technological Research and Development

Ensuring Transparency and Reliability

- 50 Continually Improving Our Environmental Management
- 55 Green Purchasing

Environmental Management

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

Environmental Management Vision

In 2004 we established a Basic Policy for achieving the J-POWER Group's Environmental Management Vision. Based on that policy we formulated an Action Program setting out medium-term goals, and we are now working toward those objectives (see pp. 79–84 for details).

Basic Policy

The J-POWER Group adheres to the following basic policy:

Basic Stance

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

Efforts Relating to Global Environmental Issues

In accordance with the principles of the United Nations Framework Convention on Climate Change,* we will cost-effectively address issues relating to climate change on a global scale. We will continue to reduce CO₂ emissions per unit of electric power sales through an economically reasonable combination of measures including maintenance and improvement of the efficiency of energy use; development of low CO₂ emission power sources; development, transfer and dissemination of new technologies; and utilization of the Kyoto Mechanisms. Furthermore, we will continue to work toward our ultimate goal of achieving zero emissions through the capture and storage of CO₂.

Efforts Relating to Local Environmental Issues

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

Ensuring Transparency and Reliability

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

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



Ishikawa Coal-fired Power Station
(Okinawa Prefecture)






Sakuma Power Station (Shizuoka Prefecture)



Aso-Nishihara Wind Farm
(Kumamoto Prefecture)

Action Program

J-POWER Group Targets

| | Efforts relating to global environmental issues (Measures against global warming)  | Efforts relating to local environmental issues (Formation of a recycling-based society)  | Ensuring transparency and reliability (Enhancement of our environmental management structure)  |
|----------------------------------|--|--|--|
| Goal | Reduce CO ₂ emissions per unit of electric power sales (All J-POWER Group power plant operations worldwide, including non-consolidated companies in which J-POWER has a stake, both in Japan and overseas) | Zero industrial waste emissions | Introduce environmental management systems across the J-POWER Group |
| Target year | FY 2010 | FY 2010 | FY 2007 |
| Numerical target or scope | 10 % reduction (below 2002 levels) | 97 % recycling rate | Entire J-POWER Group (all consolidated companies) |
| Action | Maintain and improve efficiency of energy use Develop low CO ₂ emission power sources Utilize Kyoto Mechanisms Develop, transfer, and disseminate new technologies | Promote the effective use of coal ash Reduce all types of industrial waste emitted from the maintenance and operation of power plants | Introduce environmental management systems (ISO 14001 certification acquired for all J-POWER plants by the end of FY 2005) |

Business Activities and the Environment (FY 2005)

INPUT

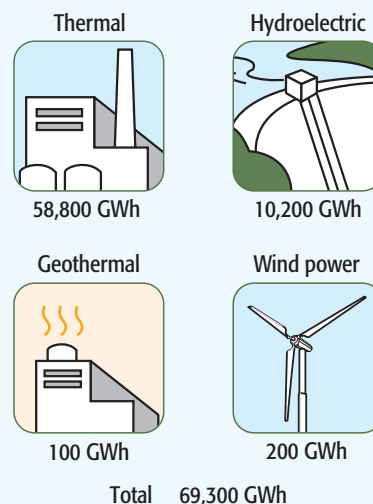
| | |
|--|------------------------------|
| ◆ Thermal Power Stations (including Wakamatsu Research Institute) | |
| Fuel | |
| Wet coal | 21.08 million tons |
| Heavy oil | 60,000 kl |
| Light oil | 30,000 kl |
| Natural gas | 124 million Nm ³ |
| Biomass (dried sewage sludge) | 1,000 tons |
| Water | |
| Industrial water | 10.56 million m ³ |
| Main Resources and Chemicals (100% basis) | |
| Limestone (CaCO ₃) | 270,000 tons |
| Ammonia (NH ₃) | 10,000 tons |
| Hydrochloric acid (HCl) | 1,000 tons |
| Sulfuric acid (H ₂ SO ₄) | 2,000 tons |
| Caustic soda (NaOH) | 6,000 tons |
| ◆ Hydroelectric Power Stations | |
| Water intake for power generation | 49.5 billion m ³ |
| Electric power consumption for pumped storage | 2,000 GWh |
| ◆ Geothermal Power Station | |
| Steam | 1.02 million tons |
| Hot Water | 4.28 million tons |
| ◆ Offices/Other Business Units | |
| Electric Power Consumption | |
| Research Institute | 26.94 GWh |
| Offices | 22 GWh |
| Water | |
| | 760,000 m ³ |
| Fuel (vehicles, boats, heating, emergency generators, etc.) | |
| Gasoline/diesel/city gas (gasoline equivalent basis) | 3,237 kl |
| Copy paper (A4 equivalent) | 62 million sheets |
| Sanitary paper | 94,000 rolls |

Notes:

1. Excluding the amount emitted as waste water, most industrial water used in thermal power plants is released into the atmosphere as steam.
2. River water is used in hydroelectric stations, but all water is returned to rivers after power generation.
3. Natural steam is used in geothermal power stations, but hot water is returned underground after power generation via a returning well.

BUSINESS ACTIVITIES

◆ Electric energy output



◆ Auxiliary power for operation and transmission loss - 3,900 GWh

Note: Totals calculated for entire J-POWER group. Amounts for joint ventures included on a pro rata basis.

Life Cycle Assessment (LCA) Efforts

J-POWER's wholesale electricity business is certified under the Eco-Leaf environmental labeling program managed by the Japan Environmental Management Association for Industry (JEMAI), and the certification is publicized on the association's website.

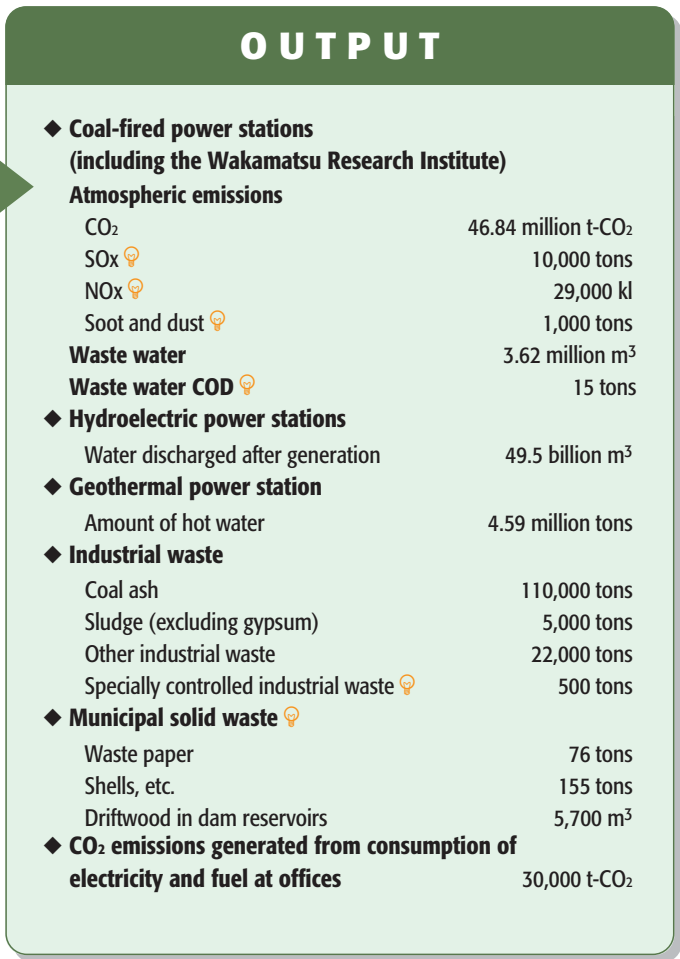
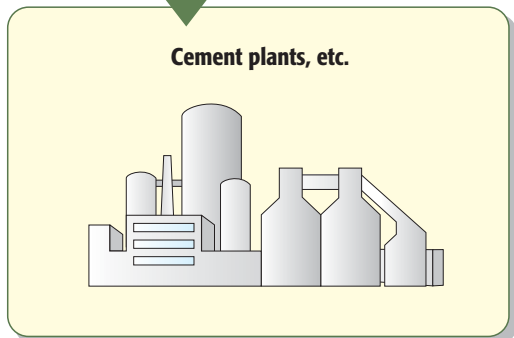
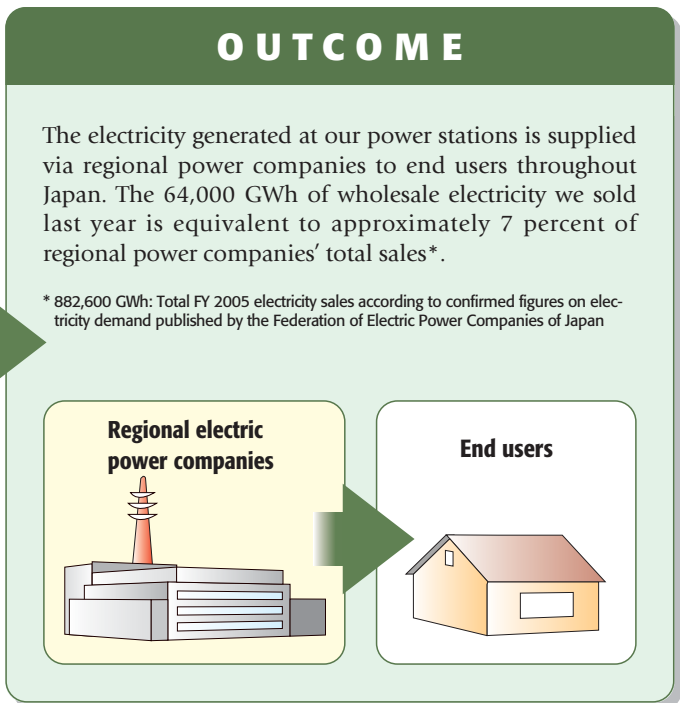
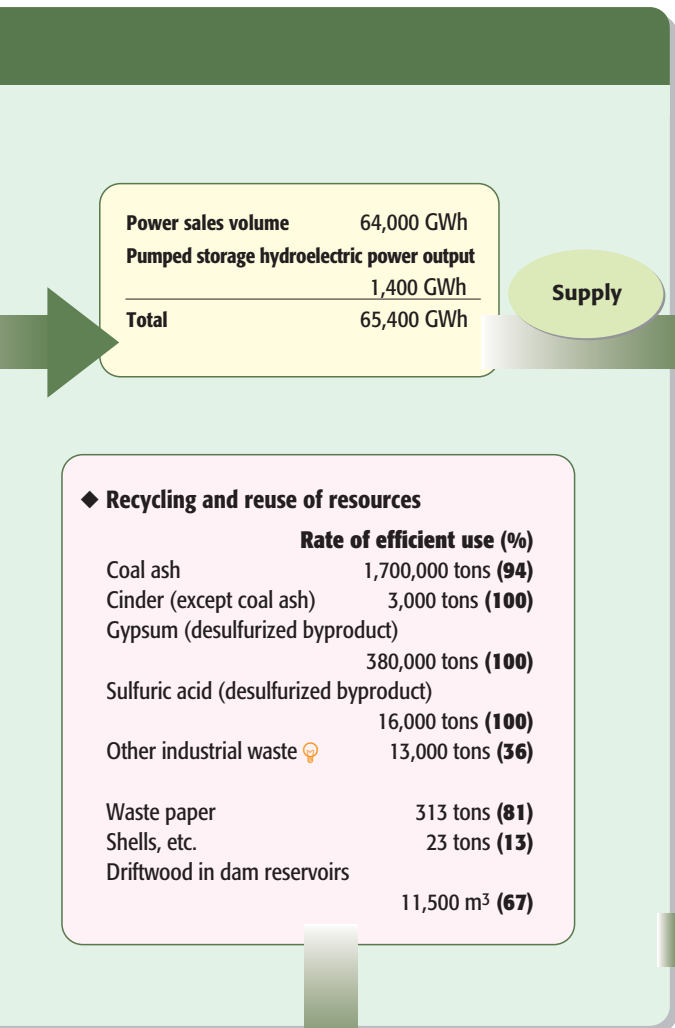
The ISO categorizes environmental labeling into Types I, II, and III. Our certification is in the Type III category, showing that the environmental impact of our products is calculated quantitatively by the LCA method at each of the production, use and disposal stages, and certified by a third party. Please refer to the JEMAI website for more details.




No.BF-04-001-A

Eco-Leaf environmental labeling

JEMAI website:
<http://www.jemai.or.jp/english/ecoleaf/index.cfm>



Environmental Accounting and Efficiency

The J-POWER Group regards environmental accounting  as an important tool for environmental management. Through ongoing disclosure of environmental accounting data, we aim to further enhance the reliability and adequacy of information on cost and effectiveness. The basic stance outlined in the Basic Policy section of the J-POWER Group Environmental Management Vision (see p. 79) sets the goal of improving environmental efficiency (production per environmental load).

Environmental Accounting

In calculating the overall cost and effectiveness in fiscal 2005 of J-POWER Group environmental conservation activities in light of the nature of our business, we referred to the Environmental Accounting Guidelines 2005 issued by the Ministry of the Environment.

◆ Calculation Guidelines




- **Period:** April 1, 2005 to March 31, 2006
Note: Fiscal year dates differ for some companies included in the scope of calculation
- **Format:** In accordance with Environmental Accounting Guidelines 2005 issued by the Ministry of the Environment
- **Scope:** Costs (including depreciation costs) for all thermal power generation companies, which have the highest environmental load in J-POWER and Group operations

- Costs were calculated focusing on expenses for: 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 again in fiscal 2005.

◆ Environmental Conservation Cost and Effectiveness


(Unit: billion yen)

| Category | Main measures and efforts | Amount |
|-----------------------------------|--|--------|
| Pollution control | Air pollution control (desulfurization/denitrification, soot and dust  treatment), water pollution control (waste-water treatment), etc. | 18.99 |
| Global environmental conservation | Measures to reduce greenhouse gas emissions (maintaining high-efficiency operation of coal-fired plants, developing renewable and unutilized energy  sources, management costs for energy-saving equipment, emission control for greenhouse gases other than CO ₂). | 2.12 |
| Resource recycling | Waste reduction through reuse and recycling, treatment and disposal of waste | 12.57 |
| Management activities | Monitoring and measurement of environmental load, labor costs for environmental conservation organizations, costs for environmental education, etc. | 1.49 |
| Research and development | High-efficiency generation, use of fuel cells, storage and capture of CO ₂ , recycling of coal ash and gypsum, etc. | 0.62 |
| Social activities | Tree-planting, environmental advertising, environmental beautification, membership of environmental groups, preparation of environmental report, etc. | 3.56 |
| International projects | Overseas cooperation projects for environmental conservation technologies | 1.03 |
| Other | Pollution load levy | 0.90 |
| | Total | 41.28 |

| Environmental conservation effectiveness | FY 2005 |
|--|-------------|
| SOx  emissions (tons) | 10,200 |
| NOx  emissions (tons) | 28,900 |
| Soot and dust emissions (tons) | 1,000 |
| CO ₂ emissions (million tons CO ₂) | 46.84 |
| Average coal-fired thermal efficiency (%) | 40.4 |
| Head office lighting electricity consumption (MWh) | 17,580 |
| SFe  recovery (%) | 98 |
| Development of renewable and unutilized energies (MW) | 12 |
| Coal ash generated (tons) | 1,810,000 |
| Gypsum generated (tons) | 380,000 |
| Driftwood recycled (m ³) | 11,500 |
| Employees completing internal environmental auditor training (cumulative total) | 351 (1,516) |
| Recycled paper purchase rate (%) | 92.0 |
| Environmental activity report (circulation) | 8,000 |
| Environmental pamphlet (circulation) | 15,000 |
| Overseas consulting projects (cumulative total) | 15 (263) |
| Foreign trainees accepted (cumulative total) | 84 (2,114) |

◆ Economic Effectiveness

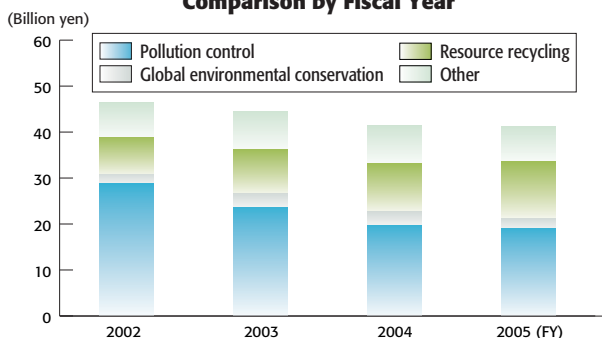
(Unit: billion yen)

| Category | Details | Amount |
|----------------|--|--------|
| Revenue | Sales of valuable resources: coal ash, gypsum, sulfuric acid | 0.36 |
| Cost-reduction | Reduction in fuel costs due to improved coal-fired thermal efficiency (introduction of USC ) | 2.16 |
| | Reduction in disposal costs due to recycling of coal ash, gypsum, and sulfuric acid | 4.69 |
| | Total | 7.21 |

◆ Environmental Conservation Cost

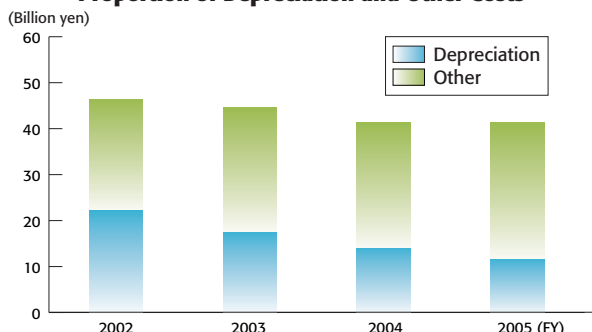
The total cost of environmental conservation in fiscal 2005 was approximately 41.3 billion yen. Although costs associated with facility operation and maintenance escalated by approximately 2.5 billion yen, a reduction of some 2.6 billion yen in depreciation costs relating to environmental conservation equipment meant that total costs were 100 million yen less than in fiscal 2004. Costs for pollution control (such as air and water pollution control) accounted for 46% of the total.

Environmental Conservation Costs: Comparison by Fiscal Year



Note: Figures up to FY 2004 are on a non-consolidated basis

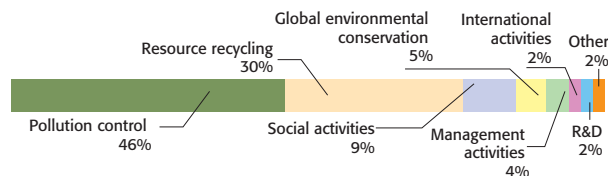
Proportion of Depreciation and Other Costs



Notes:

1. Figures up to FY 2004 are on a non-consolidated basis
2. Depreciation: cost of depreciation related to environmental conservation equipment

Environmental Conservation Costs: Breakdown by Category



◆ Environmental Conservation Effectiveness

The effects of preventing environmental pollution, maintaining current levels of environmental load, and improving the environment were measured quantitatively.

◆ Economic Effect

Efforts contributing to earnings and cost reductions are calculated to have had a positive economic effect of approximately 7.2 billion yen.

Environmental Efficiency

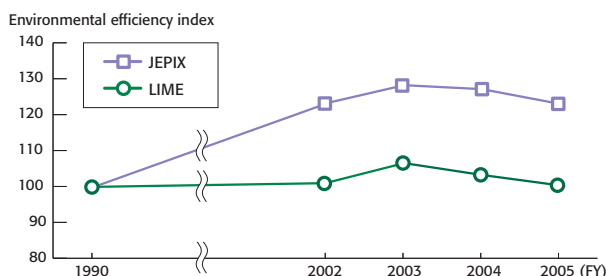
The Basic Policy section of the J-POWER Group Environmental Management Vision sets out our basic stance of reducing environmental risk and improving environmental efficiency (production per environmental load) while at the same time enhancing both environmental responsibility and economic value to contribute to sustainable development in Japan and the world as a whole.

In order to evaluate the status of environmental efforts across all our corporate activities on a single index, it is necessary to allocate certain weightings to the various items before calculating totals. In Japan, several methods for doing this have been developed, taking account of the country's particular characteristics. These include JEPIX (which uses policy targets as indicators) and LIME (which uses damage to human health and ecosystems as indicators). We have evaluated efforts for J-POWER as a whole and for coal-fired power generation using these two methods.

For J-POWER as a whole, environmental efficiency declined slightly in FY 2005 due to an increase in CO₂ emissions per unit of electric power sales. This resulted from growth in the use of coal-fired generation, which led to a relatively lower proportion of generation using renewable energy sources.

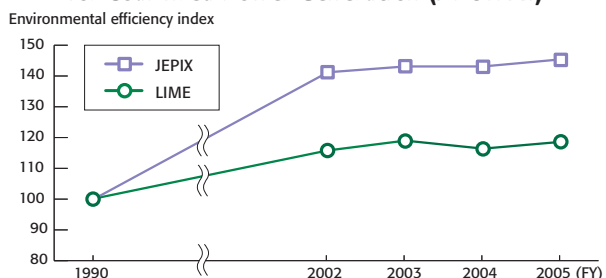
For coal-fired power generation, an upward trend in environmental efficiency is evident since 1990. This is the result of improved thermal efficiency and efforts to control SO_x and NO_x emissions.

Environmental Efficiency for J-POWER as a Whole



Note: The environmental efficiency indices use a base figure of 100 representing the overall index (electric power sales volume per environmental load) in FY 1990.

Environmental Efficiency for Coal-fired Power Generation (J-POWER)



Note: The environmental efficiency indices use a base figure of 100 representing the overall index (electric power sales volume per environmental load) in FY 1990.

Information on environmental efficiency for individual activities is included on the relevant pages of this report.