Electric Power Business—Characteristics and Strengths

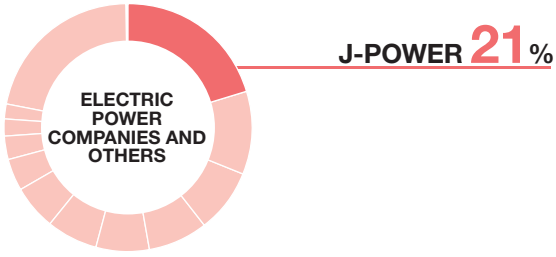
Wholesale Electric Power Business
Thermal Power

Tachibanawan Thermal Power Plant (Tokushima Prefecture)

J-POWER's key strength in thermal power generation is our focus on coal-fired power generation, which has strong cost competitiveness and fulfills base demand for electricity with a high load factor. We have long maintained the number one share in coal-fired power generation capacity since becoming the first company in Japan to use overseas coal in a thermal power plant (Matsushima Thermal Power Plant, Nagasaki Prefecture; Maximum capacity: 500 MW x2). We have also enjoyed substantial economies of scale by pioneering the building of large-scale coal-fired power plants. Coal is a natural resource found in abundance throughout the world and is arguably the most economically stable fossil fuel available. This has become even more noticeable in light of the significant volatility in oil prices in recent times. These strengths contribute to the formation of attractive rates, and our long-term contracts with EPCOs, generate synergetic effects for forming a stable earnings foundation.

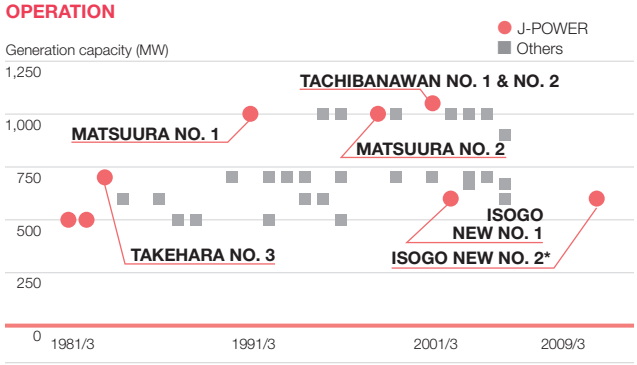
As of March 31, 2009, we operate seven coal-fired power plants with a total capacity of 7,812 MW, representing 21% of the coal-fired power generation facilities in Japan. For fuel, we procure coal from several countries, mainly from Australia, based on long-term or yearly contracts.

SHARE OF COAL-FIRED POWER GENERATION CAPACITY
(As of March 31, 2009)



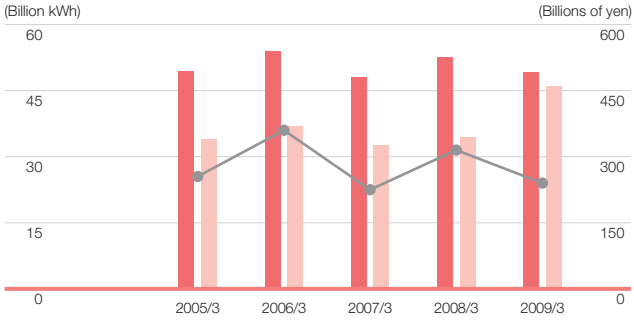
Source: Prepared by J-POWER based on reports issued by the Agency for Natural Resources and Energy.

LARGE-SCALE COAL-FIRED UNIT CAPACITY AND FIRST YEAR OF OPERATION



"Large-scale" defined as power plants with more than 500 MW output.
Chart data up to March 31, 2009 (except for Isogo New No. 2*).
Source: Agency for Natural Resources and Energy

THERMAL POWER SALES AND LOAD FACTOR



	2005/3	2006/3	2007/3	2008/3	2009/3
Power sales (Billion kWh)	49.3	54.0	48.0	52.4	49.1
Operating revenues (Billions of yen)	339.2	368.2	326.5	342.7	460.3
Load factor (%)	77	84	75	81	76

CALORIFIC UNIT PRICE BY FOSSIL FUEL (IMPORTS)

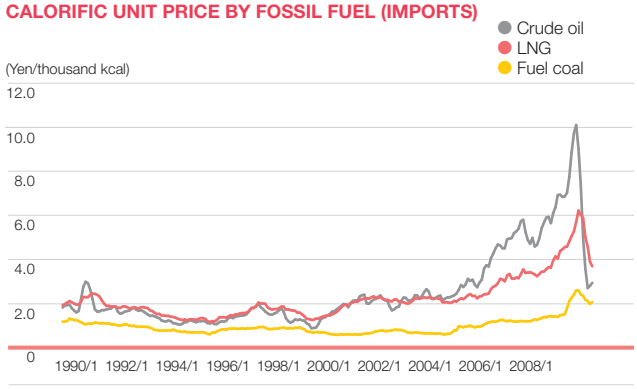
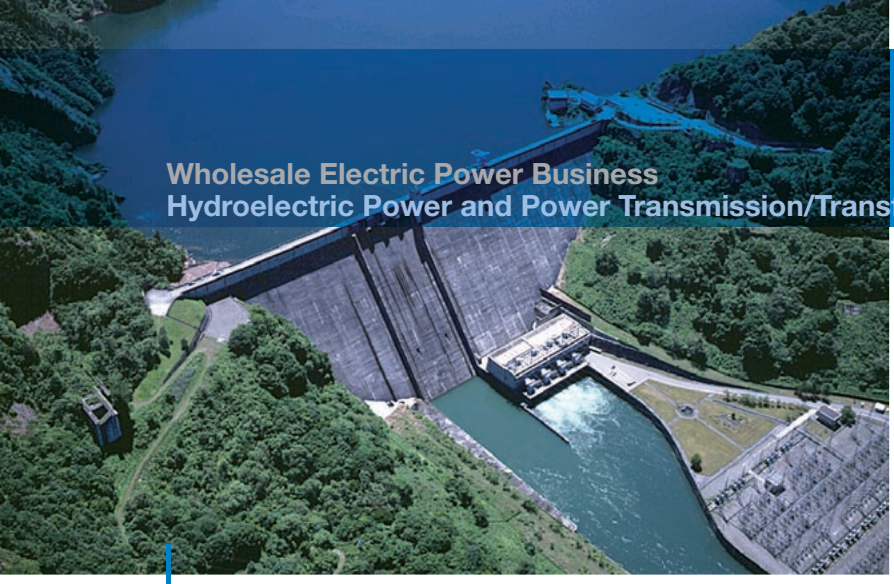


Chart data up to March 31, 2009
Source: The Energy Data and Modelling Center



Wholesale Electric Power Business
Hydroelectric Power and Power Transmission/Transforming

Tagokura Power Plant (Fukushima Prefecture)

Hydroelectric Power

Hydroelectric power is an essential power source, particularly in Japan, for three main reasons. First, it is currently the only truly domestic energy source on a meaningful scale. Second, it is a clean energy source with virtually no fuel expenses, namely marginal costs, and offers many benefits in terms of environmental issues, especially because of no CO_2 emissions. Finally, it offers outstanding flexibility in terms of the ability to adjust output to demand levels, which is suitable for intra-day and intra-seasonal demand and supply balancing.

J-POWER has the advantage of high technological expertise in developing hydroelectric power and possesses the most advanced technologies available in Japan, particularly for the construction of dams and large-scale underground structures. We have built and operated hydroelectric power plants for almost half a century, starting with the development of large-scale hydroelectric power plants represented by the Sakuma Power Plant, which started operations in 1956, and the development of pumped-storage power plants, which excel in adjusting output in response to demand peaks. As of March 31, 2009, we operate 59 hydroelectric power plants throughout Japan, with a total capacity of 8,556 MW, comprising 19% of the total hydroelectric power generation facilities in Japan.

Considering the limited availability of sites suited to the development of large-scale hydroelectric power plants in Japan, we believe our strong market share and economies of scale in hydroelectric power generation will endure for the foreseeable future.

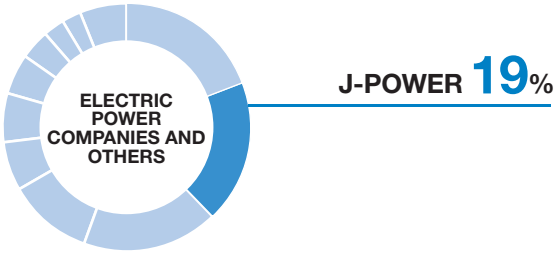
Our hydroelectric power plants generate a steady stream of earnings based on long-term contracts with EPCOs. Most of the rates for conventional-type facilities and 100% of the rates for pumped-storage-type facilities are fixed rates.

Transmission and Transforming Facilities

J-POWER's transmission and substation facilities not only distribute electricity from our power plants to demand centers, but also play a huge role in the total operation of Japan's power grid. In particular, we operate critical facilities that support the wide-area power interchange in Japan, such as extra-high-voltage transmission lines connecting Honshu with Hokkaido, Shikoku and Kyushu respectively, as well as the Sakuma Frequency Converter Station, which was the first in Japan to enable transmission of electricity between the different frequencies of Eastern Japan (50 Hz) and Western Japan (60 Hz).

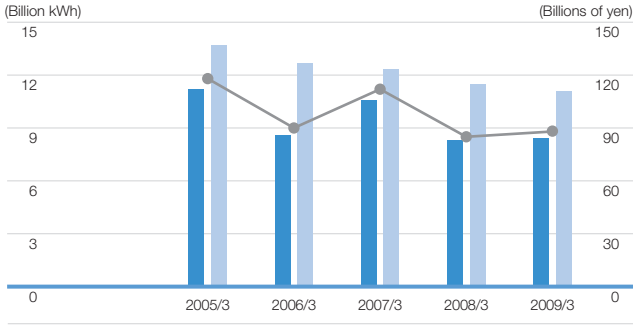
Sakuma Frequency Converter Station (Shizuoka Prefecture)

SHARE OF HYDROELECTRIC POWER GENERATION CAPACITY
(As of March 31, 2009)



Source: Reports issued by Agency for Natural Resources and Energy.

HYDROELECTRIC POWER SALES AND WATER SUPPLY RATE



	2005/3	2006/3	2007/3	2008/3	2009/3
Hydroelectric power sales (Billions kWh)	11.1	8.5	10.6	8.2	8.3
Hydroelectric operating revenues (Billions of yen)	137.1	126.8	123.4	114.5	110.9
Water supply rate (%)	118	90	112	85	88

J-POWER's Rate Structure

THERMAL POWER

Variable costs
Fuel, chemicals and other costs → **Variable portion of rate**

Fixed costs
Depreciation
Maintenance costs
Headquarters costs
Taxes
Return on capital → **Fixed portion of rate**

Fuel, maintenance and other costs comprise a high proportion of the total costs and fluctuate greatly from year to year. Therefore we revise thermal power contract rates every two years to reflect these changes. Variable costs such as fuel costs, which fluctuate in accordance with power output, are covered by the variable portion of the rates. We also maintain a fuel cost adjustment system that covers fluctuations in foreign exchange rates and the prices of heavy oil used as a supplementary fuel. Fixed costs, including depreciation, maintenance and return on capital, which are incurred equally regardless of output level, are covered by the fixed portion of the rate. This framework allows J-POWER to secure stable cash flows.

HYDROELECTRIC POWER AND TRANSMISSION

■ **Hydroelectric (excl. pumped-storage)**
Fixed costs
Depreciation
Maintenance costs
Headquarters costs
Taxes
Return on capital → **Variable portion of rate** / **Fixed portion of rate**

■ **Pumped-storage hydroelectric**
■ **Transmission** → **Fixed rate**

With regard to hydroelectric power, transmission and substation facilities, capital costs, fixed-asset taxes, etc. comprise a high proportion of the total cost, and annual cost fluctuations are small. Therefore their contract rates are set at a lower level from the start of operations and are not subject to regular revision to ensure long-term rate stability. In the case of conventional hydroelectric power, the fixed portion of the rate accounts for a higher proportion, minimizing the impact on sales caused by power output fluctuations. The contract rates of both pumped storage hydroelectric power and transmission are based entirely on the fixed rate. These rate structures enable J-POWER to generate stable cash flows.

Deregulation of the Electric Power Industry and J-POWER's Response

The deregulation of the electric power industry in Japan has created a new environment in which business enterprises other than electric power companies (EPCOs) can participate in electricity wholesaling and retailing businesses. Since April 2005, the deregulation of the retail electricity sector was expanded to approximately 60% of the market, and wholesale electricity transactions were commenced in the Japan Electric Power Exchange (JEPX).

Though the deregulation has had the effect of increasing competition and applying downward pressure on prices, J-POWER considers the deregulation to be a positive change toward expanding its business opportunities from a long-term perspective. We also recognize that it is essential for us to vigorously respond to these changes, and we are promoting the following sorts of initiatives to achieve stable growth.

- We are developing new types of wholesale electricity businesses such as the IPP business and the electricity supply business for PPSs (See page 25, Other Electric Power Businesses).
- We have commenced sales of electricity to the wholesale markets such as JEPX by utilizing a part of existing generation capacity.

Further reforms of the electric power industry have been under discussion since April 2007 in the Power Business Subcommittee of the Advisory Committee for Natural Resources and Energy. The subcommittee has decided to first implement industry reforms designed to establish a competitive environment within the existing scope of retail deregulation. Further expansion of retail deregulation is planned for review in 2013. While monitoring carefully the trends toward deregulation and responding flexibly to changes in the business environment, we aim to expand business opportunities by making use of new options created by the deregulation.

DEREGULATION OF JAPAN'S ELECTRIC POWER INDUSTRY

Phase 1 — **1995**
Introduction of competitive bidding for generation

Phase 2 — **2000**
Partial deregulation of electric power retailing (approx. 30% of power sales)

Phase 3 — **2004**
Expansion of retail deregulation (approx. 40% of power sales)

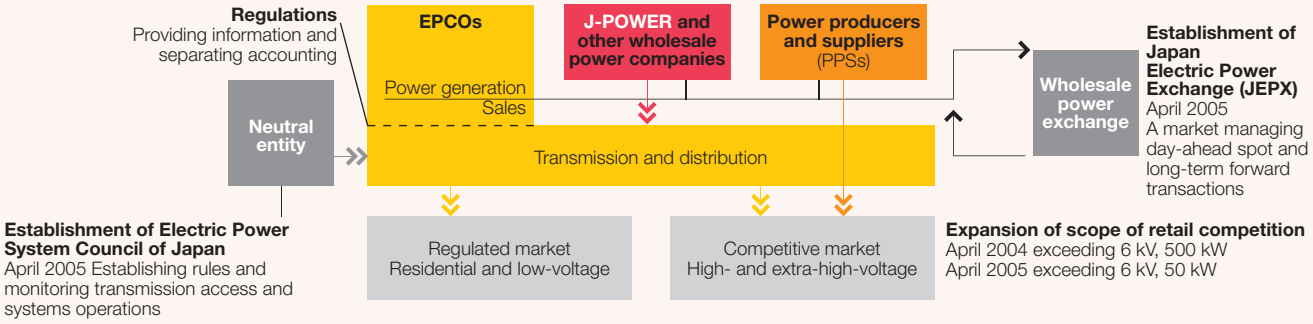
Phase 4 — **2005**
Expansion of retail deregulation (approx. 60% of power sales)
Establishment of a wholesale power exchange

Phase 5 — **2008**
Prioritize establishment of competitive environment
Postponement of retail full deregulation

Phase 6 — **2013**
Review full retail deregulation

JAPAN'S ELECTRIC POWER INDUSTRY STRUCTURE

(As of June 2009)



Other Electric Power Businesses
IPP, for PPS and Wind Power

Koriyama-Nunobiki Kogen Wind Farm (Fukushima Prefecture)

In response to the deregulation in the electric power industry, J-POWER is focusing efforts on new types of wholesale electricity businesses. Through our subsidiaries and affiliates, we are engaging in the wholesale electricity supply to EPCOs by IPPs (Independent Power Producers), as well as the wholesale electricity supply for PPSs (Power Producers and Suppliers), which are new entrants into the electricity retailing business, and wind power generation.

As of March 31, 2009, we are operating three power plants as IPPs with a total capacity of 522 MW, and three power plants for PPSs with a total capacity of 322 MW. Our wind power generation facilities comprise 12 farms/plants currently in operation as of March 31, 2009, with a total capacity of 256 MW, representing a top-ranked capacity in Japan. These businesses are areas where we are able to apply our core competencies in the power generation business.

FACILITIES OF OTHER ELECTRIC POWER BUSINESSES

(As of March 31, 2009)

Note: Including facilities of subsidiaries and affiliates.

(IN OPERATION)

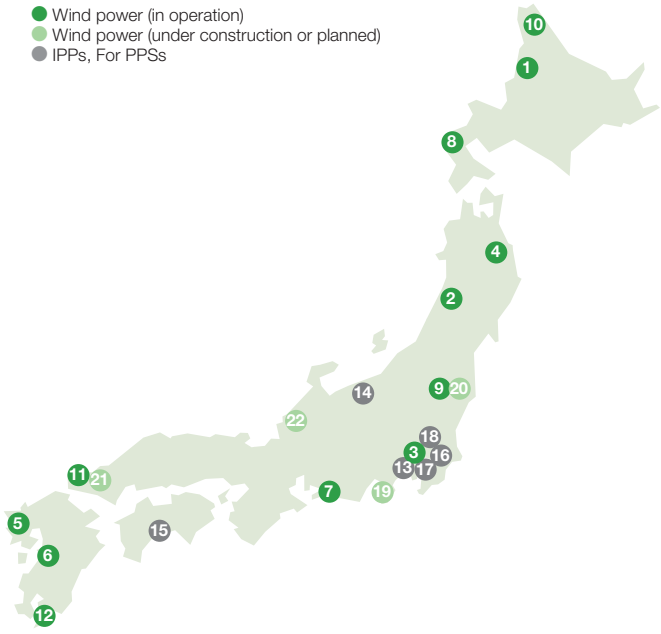
WIND POWER

	Capacity (kW)	Ownership	Completion date
1 Tomamae Winvilla*1	30,600	100%	December 2000
2 Nikaho Kogen*1	24,750	67%	December 2001
3 Tokyo Bayside	1,700	50%	March 2003
4 Green Power Kuzumaki*1	21,000	100%	December 2003
5 Nagasaki-Shikamachi*1	15,000	70%	February 2005
6 Aso-Nishihara*1	17,500	81%	February 2005
7 Tahara Bayside*1	22,000	66%	March 2005
8 Setana Seaside*1	12,000	100%	December 2005
9 Koriyama-Nunobiki Kogen*1	65,980	100%	February 2007
10 Sarakitomanai Wind Farm*1	14,850	49%	March 2009*2
11 Yokihi no Sato Wind Park*1	4,500	90%	March 2009*2
12 Minami Oosumi Wind Farm*1	26,000	80%	March 2009*2
Subtotal	**255,880**		

ELECTRICITY SUPPLY

	Capacity (kW)	Fuel type	Ownership	Completion date
IPP				
13 Genex Mizue	238,000	Gas Oil Residue	40%	June 2003
14 Itoigawa*1	134,000	Coal	80%	April 2003*2
15 Tosa	150,000	Coal	45%	April 2005
Subtotal	**522,000**			
Wholesale power for PPS				
16 Ichihara Power*1	110,000	Gas	60%	October 2004
17 Bayside Energy*1	107,650	Gas	100%	April 2005
18 Mihama Seaside	104,770	Gas	50%	October 2005
Subtotal	**322,420**			
Total of Other Electric Power Businesses	**1,100,300**			

*1 Denotes projects within the scope of consolidation *2 Limited J-POWER participation



(UNDER CONSTRUCTION OR PLANNED)

Plant name (provisional)	Capacity (kW)	Start of operations
19 Irozaki Wind Farm	34,000	Planned for 2010
20 Hiyama Kogen Wind Farm	28,000	Planned for 2010
21 Nagato Wind Farm	38,000	Planned for 2011
22 Awara Wind Farm	20,000	Planned for 2011
Total	**120,000**	