J-POWER
EPDC

2016-2017

Corporate Brochure


Photo by Shoichi Maekawa

Corporate Philosophy

Our Mission

We will meet people's needs for energy without fail,
and play our part for the sustainable development
of Japan and the rest of the world.

Our Credo

We value integrity and pride,
which drive everything we do.
We pursue harmony with the environment, and thrive
in the trust of communities where we live and work.
We regard profits as the source of our growth,
and share the fruits with the society.
We refine our knowledge constantly,
to be the pioneering leader in technologies and wisdom.
We unite diverse personalities and passions as one,
and dare create a better tomorrow.

Shokawa Cherry Trees

The two giant cherry trees growing on the Nakano observation platform along Lake Miboro (Gifu Prefecture) are Azuma-higan cherries said to be more than 450 years old. Visiting this area during construction of the Miboro Dam in 1959, Tatsunosuke Takasaki, the company's first president, conceived the idea of saving the ancient trees from the dam as a solace to the villagers whose community was soon to be submerged. It was an unprecedented undertaking, but thanks to a massive cooperative effort, the two trees were successfully transplanted. Later named the Shokawa Cherry Trees, we have continued to take care of them for more than a half-century.

Greetings

At the Electric Power Development Co., Ltd. (J-POWER) we have been supplying low-cost, stable electricity for over 60 years while constructing and operating power transmission lines to boost Japan's economic growth and improve people's living standards. The J-Power Group operates power stations at 95 locations nationwide as of the end of March 2016 with a total installed capacity of 18 GW and a total transmission distance of 2,400 km in Japan.

We have been providing engineering consultancy services overseas for over half a century, primarily in the developing countries. These consist of consulting operations covering surveys, design and construction supervision in the areas of hydroelectric and thermal power generation as well as power transmission and transforming and also including environmental preservation measures. Utilizing this knowledge, we are actively engaged in overseas electric power related business operations. We have participated in various projects totaling about 7.5 GW, making a total output of approximately 20.47 GW.

Last year, the Japanese government formulated a power source mix target for 2030. In addition, in the same year the international society agreed to new CO_2 reduction targets. Moreover, from April this year the deregulation of the retail electric power business was implemented in Japan. The regulations governing wholesaling of electricity were abolished and innovation in electric power systems is now making solid progress. Thus, Japan's energy sector is undergoing major changes.

As the environment surrounding this business sector are changes, we will continue to exert our utmost efforts to fulfill our mission, that is, "to continue to supply energy to where it is needed while contributing to the sustainable development of Japan and the world."

Chairman M. Kitamura

President T. Watanabe


Masayoshi Kitamura：Chairman　Toshifumi Watanabe：President

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Company History

For more than 60 years J-POWER has expanded and diversified its business operations while maintaining a focus on energy and the environment.
Building on our achievements and marshaling technologies developed in Japan and around the world, we continue our journey with a firm commitment to sustainable growth.

Launching of large-scale hydropower generation, domestic coal-fired power generation and overseas businesses

With the Electric Power Development Promotion Law enforced in July 1952 to ease nationwide power shortages, J-POWER, which was established in September of the same year, started to develop large-scale hydropower generation.


Sakuma Dam

September 1952	Establishment of J-POWER
April 1956	Sakuma Power Station started operation
May 1959	Tagokura Power Station started operation
May 1959	Tadami Trunk Line and Minamikawagoe Substation started operation
December 1960	Okutadami Power Station started operation
January 1961	Miboro Power Station started operation
November 1962	Tacna Hydropower Project (Peru) started
January 1963	Wakamatsu Thermal Power Station started operation
September 1964	Ikehara Pumped Storage Power Station started operation
October 1965	Sakuma Frequency Converter Station started operation
March 1967	Kwai Yai No.1 (Srinagarind) Hydropower Project in Thailand Hydropower Project Started
May 1967	Isogo Thermal Power Station started operation
July 1967	Takehara Thermal Power Station started operation
July 1968	Takasago Thermal Power Station started operation

Construction of large-scale pumped storage power stations and high-capacity transmission lines

With oil-fired power generation becoming a major power source and nuclear power development progressing, power demand in summer began to rise sharply. J-POWER, therefore, started to develop large-scale pumped storage power generation and high-capacity transmission lines.


Numappara Dam (left)

September 1969	Hanna Trunk Line (500kV) started operation
November 1972	Shintoyone Pumped Storage Power Station started operation
June 1973	Numappara Pumped Storage Power Station started operation
March 1975	Onikobe Geothermal Power Station started operation
July 1978	Okukiyotsu Pumped Storage Power Station started operation
August 1979	Tedorigawa No. 1 Power Station started operation
December 1979	Hokkaido-Honshu Interconnection Line (Hakodate-Kamikita Power Converter Station) started operation
May 1980	West Area Interconnection Line started full-scale operation

Imported coal-fired power generation projects

Because of growing need for diversifying energy sources after twice oil crisis in the 1970s, J-POWER started to construct Japan's first large-scale, coal-fired power station, and acted as a pioneer in using imported coal.


Matsushima Thermal Power Station

August 1979	Signed a memorandum of understanding for rights to develop Blair Athol Coal Mine in Australia
January 1981	Matsushima Thermal Power Station started operation
July 1982	Sakuma No. 2 Power Station started operation
March 1983	Takehara Thermal Power Station (Unit 3) started operation
November 1986	Ishikawa Coal Thermal Power Station started operation
April 1988	Shimogo Pumped Storage Power Station started operation
April 1990	Masinloc Coal-fired Thermal Power Project, the Philippines
May 1990	Purulia Pumped Storage Power Project, India
June 1990	Matsuura Thermal Power Station started operation

New technologies and overseas operations

With power demand growing, J-POWER has been focusing on improving overall energy efficiency and addressing environmental problems, while being engaged in a variety of activities at home and abroad in an era of globalization.


Roi-Et Biomass Power Station

July 1992	Signed a framework agreement on demonstration of desulfurization technology (China)
July 1994	Honshu-Shikoku Interconnection Line started operations
June 1996	Okukiyotsu No. 2 Pumped Storage Power Station started operation
February 2000	Extended Honshu-Shikoku Interconnection Line
April 2000	Took a stake in Roi-Et Biomass IPP project (Thailand)
June 2000	Kii Channel HVDC Interconnection Line started operation
July 2000	Tachibanawan Thermal Power Station started operation
December 2000	Took a stake in Tianshi Coal-fired Power Station (China)
December 2000	Tomamae Winvilla Wind Farm started operation
February 2002	Multi-Purpose Coal Gasification Technology Development (EAGLE) project launched test operations

Privatization and a new "J-POWER"

J-POWER will continue growing through its contribution to the sustainable development of Japan and the world, while developing new technologies to achieve harmony between energy supply and the environment.


Koriyama-Nunobiki Kogen Wind Farm

October 2003	The Electric Power Development Promotion Law abolished
November 2003	Upper Kotmale Hydroelectric Power Station (Sri Lanka)
October 2004	J-POWER fully privatized, with its shares listed on the First Section of the Tokyo Stock Exchange
April 2005	Participated in CBK hydropower generation project (The Philippines)
May 2006	Took a stake in Tenaska Frontier Power Station (U.S.A.)
February 2007	Koriyama-Nunobiki Kogen Wind Farm started operation
May 2007	Kaeng Khoi 2 Gas-fired Power Station started operation (Thailand)
May 2008	Started construction of Ohma Nuclear Power Station
July 2009	Isogo Thermal Power Station (new Unit 2) started operation
June 2010	Orange Grove Power Station started operation (U.S.A.)
March 2011	Miyazaki Wood Pellet's manufacturing plant started operation
August 2012	Hezhou Power Station started operation (China)
June 2014	Nong Saeng Gas Fired Power Station started operation (Thailand)
July 2014	Isawa No.1 Power Station started operation
June 2015	Utai Gas Fired Power Station started operation (Thailand)

J-POWER Operations in Japan

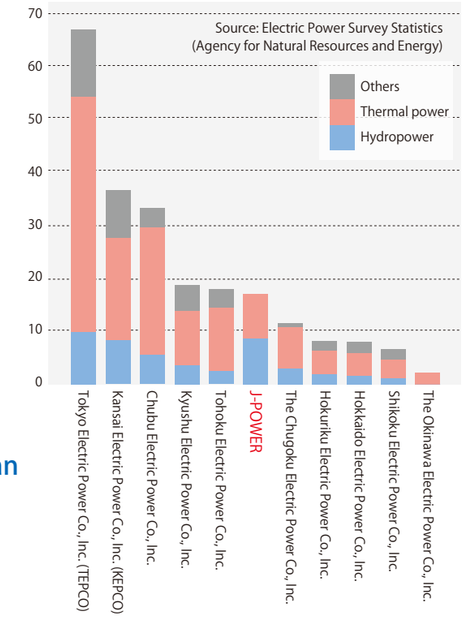
J-POWER Group produces electric power at more than 90 power stations around Japan and delivers electricity via some 2,400 kilometers of transmission lines.

J-POWER Group Facilities
(as of March 31, 2016)

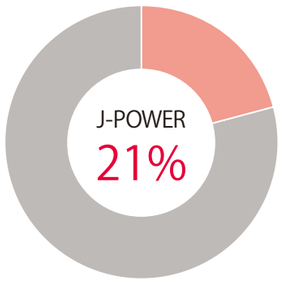
		Owned capacity shown in brackets
Power generation facilities	95 locations	Capacity 18,129,430kW【17,843,225kW】
Hydropower stations	60	8,570,670kW【8,570,670kW】
Thermal power stations	12	9,108,420kW【8,856,320kW】
Geothermal power station	1	15,000kW【15,000kW】
Wind power stations	20	402,460kW【389,468kW】
Other power generation facilities	2	32,880kW【11,767kW】
Transmission lines		Total length 2,407.9km
AC power transmission lines		2,140.7km
DC power transmission lines		267.2km
Substations	4 locations	Capacity 4,301,000kVA
Frequency converter station	1 location	Capacity 300,000kW
AC/DC converter stations	4 locations	Capacity 2,000,000kW
Telecommunication network	Total circuit length 5,986km	

Generation Capacity of J-POWER and Other Major Power Companies
(as of March 31, 2016)

(Unit: GW)

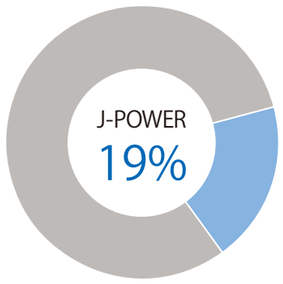


Share of Coal-fired Power Installed Capacity in Japan
(as of March 31, 2016)



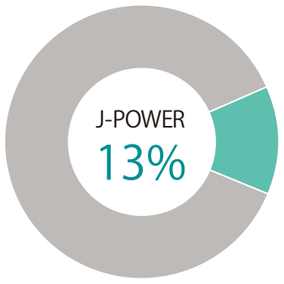
Source: Electricity Review Japan
(Federation of Electric Power Companies of Japan),
Electric Power Survey Statistics
(The Agency for Natural Resources and Energy)

Share of Hydropower Installed Capacity in Japan
(as of March 31, 2016)

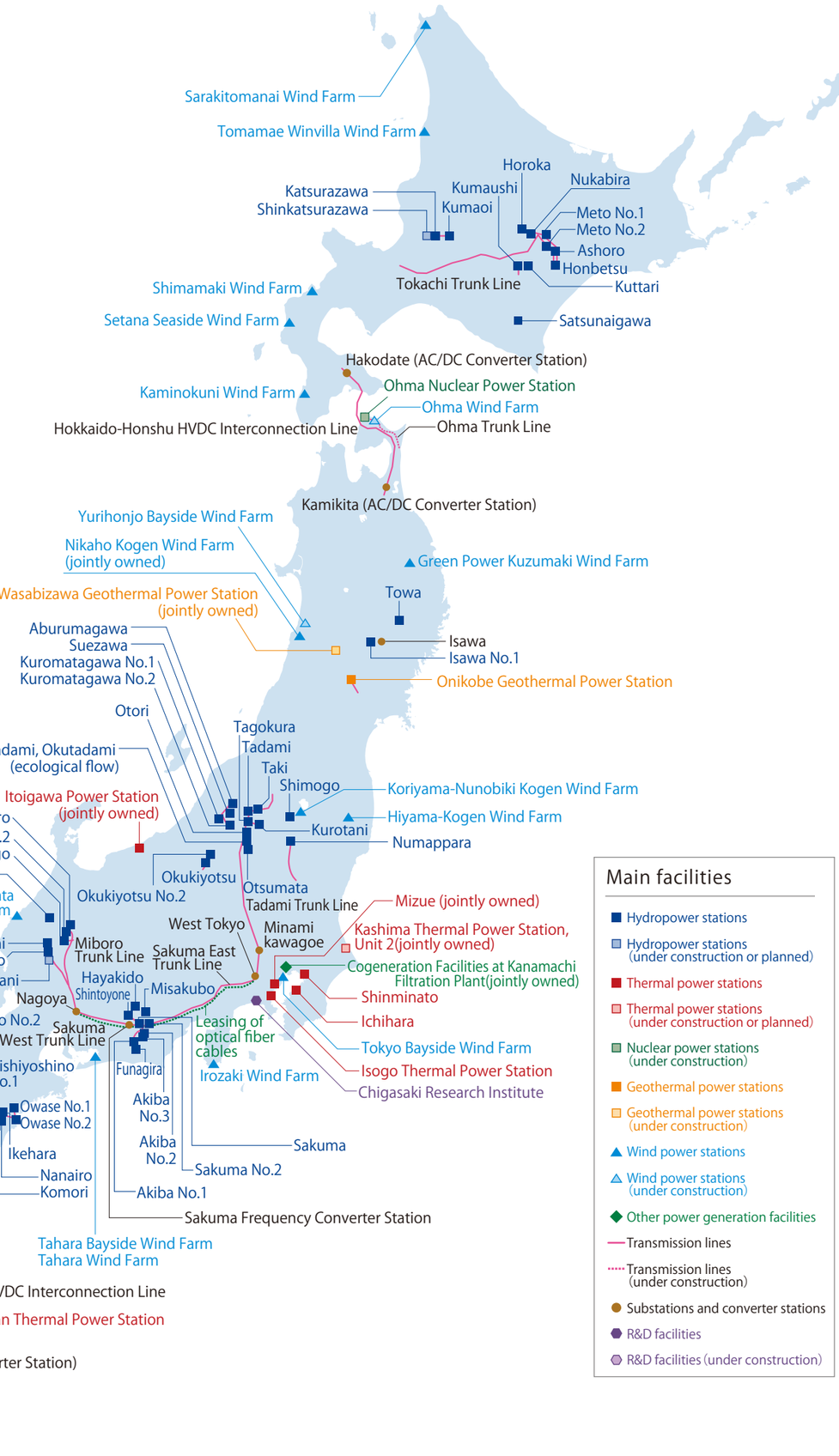


Source: Electric Power Survey Statistics
(Agency for Natural Resources and Energy)

Share of Wind Power Installed Capacity in Japan
(based on estimated owned capacity as of March 31, 2016)



Source: Compiled from data supplied
by the Japan Wind Power Association.



Thermal Power

Coal is a reliable energy source available in stable supplies, thanks to abundant reserves distributed widely around the globe, and as such it provides an important source of baseload power in Japan. Coal-fired thermal power currently accounts for about 30% of all electricity generated in Japan and about 40% worldwide, and it will continue to play an important role in Japan's energy mix going forward.
J-POWER has been improving and refining its coal-fired thermal power technology as an industry leader for more than a half-century. Guided by a vision of the future, including the development of next-generation low-carbon technologies, we will continue doing our part to provide stable energy supplies in Japan and around the world.

Coal-Fired Thermal Power

Overview

J-POWER has been in the business of coal-fired thermal power generation for more than a half-century, since the 1963 startup of the Wakamatsu Thermal Power Station in Kitakyushu City (now the site of the Wakamatsu Operations & General Management Office and Wakamatsu Research Institute). Since then, we have worked diligently to reduce the environmental impact of coal-fired thermal power through measures to boost power generation efficiency and protect the environment.
J-POWER's Isogo Thermal Power Station New Unit 2 (Yokohama City), which became operational in July 2009, ranks among the world's most advanced coal-fired power plants in both environmental measures and generation efficiency.
J-POWER will continue to promote clean, high-efficiency coal-fired power generation through proper maintenance and replacement of facilities as well as construction of new power stations.

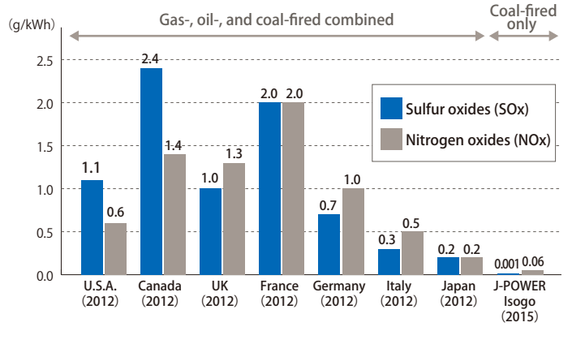
Isogo Thermal Power Station

Environmental Measures at Our Coal-Fired Power Stations

J-POWER's coal-fired thermal power stations have adopted a wide range of measures to minimize the impact of their operations on the local environment, using the latest environmental technology and know-how to prevent air pollution, water contamination, disruption from noise and vibration, and more.
Our newest coal-fired generation facilities, Isogo Thermal Power Station New Unit 1 and New Unit 2, are equipped with advanced anti-pollution technology, including the ReACT (Regenerative Activated Coke Technology) dry-type flue gas desulfurization-denitrification system. As a result, emissions of atmospheric pollutants are a fraction of the average levels for coal-fired generation among the major industrial countries, making the Isogo Thermal Power Station a world leader in environmental performance. Group company J-POWER EnTech Co., Inc. provides engineering solutions based on this ReACT pollution-control technology.

Dry desulfurization unit (Isogo Thermal Power Station, new Unit 2)

International comparison of SOx and NOx emissions from thermal power stations per unit electricity generated (g/kWh)

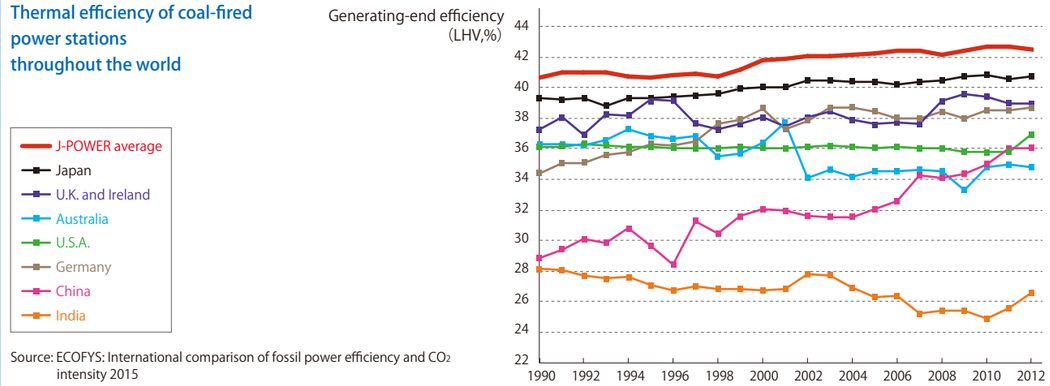


Source
Overseas: Emissions/OECD.StatExtract Complete database available
Output/IEA ENERGY BALANCES OF OECD
COUNTRIES 2014 EDITION
Researched by the Federation of Electric Power Companies of Japan

High-Efficiency Coal-Fired Power Generation

In pursuit of high-efficiency generation, J-POWER's coal-fired thermal power stations were among the first to adopt ultra-supercritical (USC*) technology, which operates boilers at a high temperature and high pressure for maximum operating efficiency. Higher efficiency means lower CO_2 emissions per unit of electricity generated.
As thermal power facilities deteriorate with age, their thermal efficiency declines, resulting in greater fuel usage. J-POWER takes proactive steps to maintain optimum efficiency through installation of high-efficiency equipment and proper maintenance. By maintaining thermal efficiency, we avoid increased fuel consumption and thereby curb CO_2 emissions.

Thermal efficiency of coal-fired power stations throughout the world



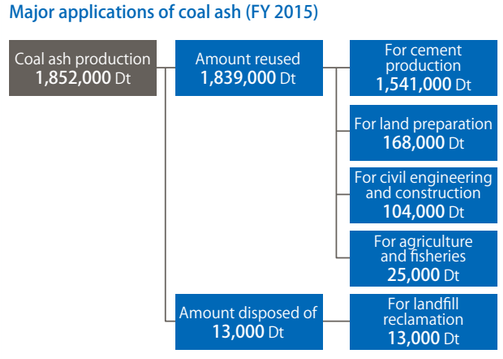
Source: ECOFYS: International comparison of fossil power efficiency and CO_2 intensity 2015

*USC: Ultra Super Critical

Beneficial Use of Coal Ash

Coal-fired thermal power stations produce coal ash as a byproduct of coal combustion. The coal ash produced by our plants is recycled in the form of fertilizer and an ingredient in the manufacture of cement, concrete, and other construction materials.
J-POWER Group company Kaihatsu Hiryou Co., Ltd. produces and sells fertilizer made from coal ash.

Major applications of coal ash (FY 2015)



Including the amount equivalent to the investment ratio of each consolidated subsidiary in Japan

*Figures may not add up due to rounding.

Biomass Mixed Combustion

J-POWER is working to preserve the environment through combustion of biomass fuel along with coal at its coal-fired thermal power stations. Mixed combustion of CO_2-free biomass fuel along with coal can reduce the amount of coal consumed in power generation and cut CO_2 emissions.
Combustion of biomass fuel at J-POWER's high-efficiency low-polluting coal-fired thermal power offers a cleaner and more efficient option for the utilization of biomass resources.

Matsuura Thermal Power Station (Nagasaki Prefecture), which burns wood-based chips, a form of biomass fuel

Development of New Power Sources

At Takehara Thermal Power Station (Hiroshima Prefecture), construction is underway on New Unit 1 (600 MW). This state-of-the-art coal-fired thermal power facility is being built to replace the two existing units, whose combined capacity is equal to that of the new unit (replacement project). With the help of cutting-edge ultra-supercritical boiler technology, New Unit 1 has one of the highest generation efficiency among coal-fired thermal power plant in Japan. Such improvement in generation efficiency will reduce coal consumption, resulting in lower CO_2 emissions and significantly reducing the carbon footprint of power generation.

Takehara Thermal Power Station with new Unit 1 (Conceptual Drawing)

Replacement projects

Power station name	Capacity	Planned startup
Takehara Thermal Power Station, new Unit 1 (Hiroshima Prefecture)	600 MW	June 2020
Takasago Thermal Power Station, new Unit 1 and Unit 2 (Hyogo Prefecture)	1.2 GW (New Unit 1: 600 MW New Unit 2: 600 MW)	New Unit 1: FY 2021 New Unit 2: FY 2027

New projects

Power station name	Capacity	Partners	Planned startup
Kashima Thermal Power Station, Unit 2 (Ibaraki Prefecture)	650 MW class	Nippon Steel & Sumitomo Metal Corporation	2020
Nishiokinoyama Power Station (provisional name) (Yamaguchi Prefecture)	1.2 GW	Osaka Gas Co., Ltd. Ube Industries Ltd.	Unit 1: 2023 Unit 2: 2025

Other Thermal Power Operations

Electric Power Energy Business

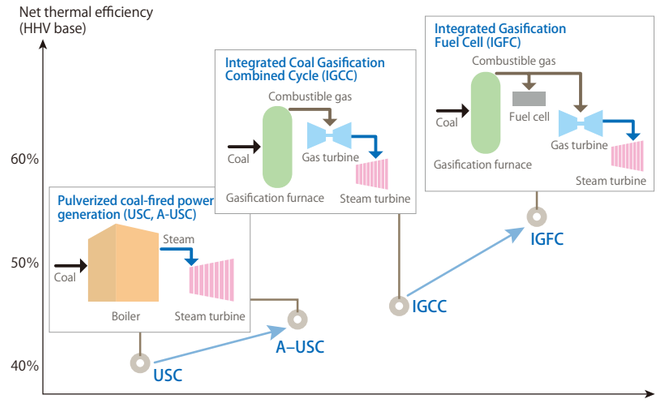
In addition to the coal-fired thermal power stations owned and operated by J-POWER, five thermal facilities run by J-POWER subsidiaries and affiliates, including gas-fired plants, are operating commercially in Japan's retail electricity sector, which has undergone incremental liberalization since 2000. We have also been selling a portion of J-POWER's own capacity on the wholesale market through the Japan Electric Power Exchange (JEPX).
Another undertaking in the thermal power segment is the Kanamachi Filtration Plant PFI, a private finance initiative model business. This operation at the Tokyo Metropolitan Government's filtration plant in Katsushika provides on-site energy services via a cogeneration system that produces both electricity and steam.

Mihama Seaside Power Co., Ltd. Shin-minato power station (Chiba City)

Research and Development of Next-Generation Low-Carbon Technologies

Maximizing Efficiency of Coal-Fired Power

J-POWER is pursuing research and development aimed at further enhancing the efficiency of coal-fired power generation with a view to reducing CO_2 emissions. Among the next-generation technologies in our development pipeline are advanced ultra-supercritical (A-USC) technology for operation at even higher steam temperatures; integrated coal gasification combined cycle (IGCC), which generates electricity using a combination of gas turbines fueled by gasified coal and steam turbines powered by exhaust heat from the gas turbines and integrated coal gasification fuel cell combined cycle (IGFC), which uses fuel cells in combination with IGCC technology.
Among our achievements is the EAGLE project (Kitakyushu City), which we pursued in collaboration with the New Energy and Industrial Technology Development Organization (NEDO) for over a decade, until the project ended in 2014. In the course of the project, we test-operated an IGCC pilot plant and conducted research into the development of CO_2 separation and capture technology. Building on the expertise gained through the EAGLE project, we have now embarked on a large-scale demonstration project named the Osaki CoolGen Project (Hiroshima Prefecture).



Osaki CoolGen Project

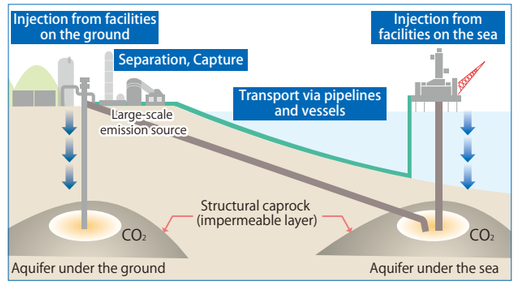
J-POWER and The Chugoku Electric Power Co., Inc. jointly founded Osaki CoolGen Corporation for the purpose of demonstrating IGCC, IGFC, and CO_2 capture technologies, building on the achievements of the EAGLE project and the knowledge gained from it.
As part of a project subsidized by NEDO, we have built a 166 MW oxygen-blown IGCC demonstration plant in Osakikamijima-cho in Toyota-gun, Hiroshima Prefecture.
With respect to the IGCC generation system, commissioning of the demonstration plant began in April 2016, and demonstration tests are scheduled to begin in March 2017. The next phase of the project involves installation of CO_2 capture equipment to work in conjunction with the IGCC system. We plan to begin work on this phase in fiscal 2016 with a view to launching demonstration tests of an IGCC system incorporating CO_2 capture sometime in fiscal 2019.

Osaki CoolGen Corporation

Research and Development of Carbon Capture and Storage Technology

CO_2 capture and storage, or CCS, is technology for collecting the CO_2 produced in the process of power generation and sequestering it underground. J-POWER is conducting R&D in this area, building on the achievements of the EAGLE project and the joint Japanese-Australian Callide Oxyfuel Combustion Project.

CCS technology overview



Renewable Energy

From its inception J-POWER has been involved in the development of renewable energy in the form of hydroelectric power, and it has since expanded into such areas as geothermal power, wind power, and manufacture of biomass fuel. Japan's Basic Energy Plan characterizes renewable energy as a promising domestic source of energy that can contribute to the country's energy security.
Determined to be a leader in the field of renewable energy, J-POWER will continue its efforts to expand the use of renewable energy as a CO_2-free source of electric power.

Hydroelectric Power

Overview

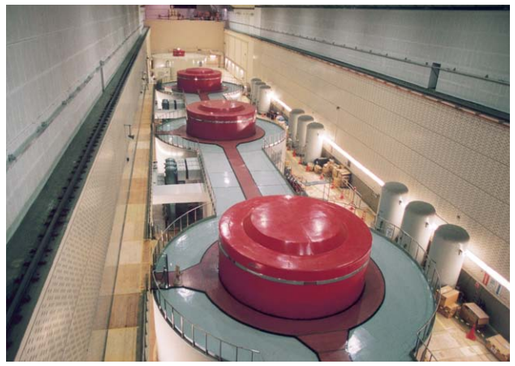
J-POWER has been engaged in the construction and operation of hydroelectric power facilities for more than 60 years, from such large-scale conventional plants as the Sakuma Power Station (Hamamatsu City), which began operating in 1956, to the development of pumped storage plants, which facilitate adjustment of output to meet peak demand. Nationwide, J-POWER currently has 60 domestic hydroelectric power facilities with a combined capacity of about 8.6 GW, accounting for almost 20% of hydroelectric power generation in Japan.
In recent years, J-POWER has undertaken a variety of initiatives aimed at improving the reliability and efficiency of our existing hydroelectric facilities and expanding our utilization of this valuable carbon-free hydroelectric resource.


Sakuma Dam

Development of Large-Scale Hydropower Generations

One of the salient features of J-POWER's hydroelectric power stations is their large capacity. Large-scale conventional hydroelectric power*1 stations and pumped storage*2 power stations built on rivers with abundantly flowing water form the backbone of our hydroelectric power capability. With their ability to respond to fluctuations in electricity demand over the course of a day and from season to season, they make an important contribution to the power supply around the nation.
J-POWER's Okutadami Power Station (Fukushima Prefecture) boasts the largest capacity of any conventional hydroelectric power facility in Japan.

*1 Conventional hydroelectric power: A method of collecting and releasing naturally flowing water to generate electricity.
*2 Pumped storage: A method of artificially pumping water to a higher elevation and releasing it to generate electricity.


Okutadami Power Station

Comprehensive Refurbishment of Hydropower Generations

At J-POWER, we strive to maximize the reliability and efficiency of our hydroelectric power stations by refurbishing all major electrical installations as they age and providing proper maintenance and management of existing facilities.
Akiba No.2 Hydroelectric Power Station (Hamamatsu City) underwent refurbishment from 2015 to 2016. By applying the latest analytical and design methods, including modification of the water turbine's runner blades, the improvement project was able to boost the plant's capacity by 400 kW to 35.3 MW.
A similar overhaul at the Akiba No. 1 Hydroelectric Power Station (Hamamatsu City), scheduled to begin in October 2016, is expected to increase that plant's capacity from 45.3 MW to 47.2 MW.


Installing a new turbine runner at the Akiba No. 2 Power Station

Small- and Medium-scale Hydroelectric Power

J-POWER is actively pursuing the development of small- and medium-scale hydroelectric power facilities to make use of untapped hydroelectric resources. The Kuttari Hydroelectric Power Station utilizes river maintenance flow from the Kuttari Dam in Hokkaido to generate up to 470 kW of electricity.
The Konokidani Hydroelectric Power Station, currently under construction, will take advantage of a drop at the Konokidani intake of the Kuzuryu Dam reservoir to generate up to 199 kW.

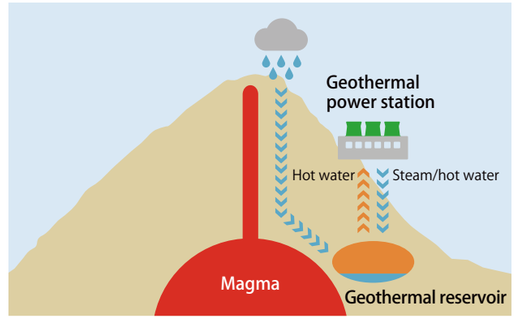

Kuttari Power Station (center) was developed by partially refitting the outlet works at Kuttari Dam.

Geothermal Power

Overview

Geothermal energy is a renewable and purely domestic energy source that produces virtually no CO_2 emissions during generation and promises steady output all year long, regardless of weather conditions. J-POWER has been producing geothermal power for more than 40 years at the Onikobe Geothermal Power Station (15 MW) in Osaki City (Miyagi Prefecture), in operation since 1975.

Geothermal Power Generation (conceptual diagram)



First Large-Scale Geothermal Plant in 23 Years

J-POWER is currently working to develop a brand-new large-scale geothermal power station. J-POWER, Mitsubishi Materials Corporation, and Mitsubishi Gas Chemical Company Inc. have established Yuzawa Geothermal Power Inc. to collaborate on construction of the Wasabizawa Geothermal Power Station (42 MW) in Yuzawa City, Akita Prefecture. It will be Japan's first large-scale (10 MW or more) geothermal power project in 23 years.
J-POWER is also pursuing plans to replace the Onikobe Geothermal Power Station with the latest generating with a new, cutting-edge facility.


Wasabizawa Geothermal Power Station (Conceptual Drawing)

Wind Power

Overview

J-POWER has been a leader in the use of wind, a clean, renewable energy source, in the generation of electricity. Today J-POWER is the second-largest provider of wind power in Japan, operating 20 wind farms with a combined capacity of 402.5 MW, as of March 31, 2016.
Overseas, we took part in the construction of the Zajaczkowo Wind Farm (48 MW) in Poland, now operating on a commercial basis.
With the technology and know-how accumulated through years of experience building, operating, and maintaining power stations and transmission lines, J-POWER is uniquely positioned to provide the complete package in wind power, from wind resource assessments to planning, construction, operation, and maintenance. We are leveraging these strengths to expand our operations in this area.


Kaminokuni Wind Farm (Hokkaido)

Development of New Wind Power Capacity

J-POWER is actively developing new wind power capacity. In April 2016, we launched full-scale commercial operations at Minami Ehime Wind Farm (Ehime Prefecture). With a capacity of 28.5 MW, it is Shikoku's largest wind power generating facility. In May 2016, operations began at J-POWER's new 19.5 MW Ohma Wind Farm in Ohma-machi, Shimokita-gun, Aomori Prefecture.
We are also involved in several new construction projects, including the Yurihonjo Bayside Wind Farm (Akita Prefecture) and the Setana Osato Wind Farm (Hokkaido).


Minami Ehime Wind Farm

Recycling and Biomass

J-POWER is aggressively promoting the beneficial use of biomass (organic matter as an energy resource) as a substitute or supplementary fuel in our coal-fired thermal power stations with a view to reducing CO_2 emissions. Our business in this area includes the production of fuel from sewage sludge in Hiroshima City and other cities using low-temperature carbonization technology and the production of wood-pellet fuel from forest residue in Kobayashi City, Miyazaki Prefecture. We are also operating a facility in Saikai City, Nagasaki Prefecture, that manufactures carbonized fuel from municipal solid waste.
In Omuta City, Fukuoka Prefecture, J-POWER is part of an initiative involving high-efficiency power generation from combustion of Refuse-Derived Fuel (RDF) made by compressing and pelletizing municipal solid waste. We are also participating in power generation involving the gasification and melting of municipal solid waste at the Narumi Waste Disposal Plant in Nagoya City.

Biomass Fuels


■ : Wood pellet


■ : Low-temperature carbonized sewage sludge fuel


■ : Carbonized fuel produced from municipal solid waste

Nuclear Power

From the perspective of steady energy supply, nuclear power is an essential and indispensable source of energy for Japan, an island country with limited natural resources. It is also a source of energy that provides an effective countermeasure to global warming.
We believe it is necessary for nuclear power to continue playing a constant role in Japan's electric power supply because it can be an effective source of energy, assuming, of course, that adequate safety management measures are taken.

Construction of the Ohma Nuclear Power Plant

Since May 2008, J-POWER has been engaged in construction of the Ohma Nuclear Power Plant in Ohma-machi, Shimokita-gun, Aomori Prefecture, with the necessary permits and approvals in hand. It is a key power plant that will perform a crucial role both in the stable provision of a highly safe and reliable supply of electric power, achieved through the use of cutting-edge technology, and in the nuclear fuel cycle for reuse of plutonium and uranium obtained through reprocessing of spent fuel.
On December 16, 2014, J-POWER submitted an application for permission for alteration of the reactor installation license to the Nuclear Regulation Authority (NRA) in order to comply with new safety standards adopted in the wake of the accident at the Fukushima Daiichi Nuclear Power Station. The application is under review by the NRA. Meanwhile, J-POWER has installed a simulator for plant operator training at the operation training and public information center. We have boosted operational skills and knowledge of accident management through simulation training.
At J-POWER, we will not be content simply to comply with regulatory requirements but will undertake voluntary safety measures and strive tirelessly to enhance safety as we go all out to build a safe nuclear power plant.

Ohma Nuclear Power Plant under construction

Plan Overview

Location	Ohma- machi, Shimokita-gun, Aomori Prefecture
Output	1.383 GW
Site area	130 ha
Reactor type	Advanced Boiling Water Reactor (ABWR)
Start of construction	May 2008
Start of commercial operations	To be determined
Fuel	Enriched uranium and uranium-plutonium mixed oxide (MOX)


Simulator for plant operators training

Advanced Boiling Water Reactor (ABWR)

The advanced boiling water reactor (ABWR) to be installed at Ohma Nuclear Power Plant incorporates cutting-edge technology, combined with the expertise and experience of the government, BWR manufacturers at home and abroad, and electric power companies in the construction and operation of nearly 100 BWRs around the world.
The advantages of the ABWR are listed below.

◎ Improved safety and reliability
◎ Reduced radiation exposure for workers
◎ Reduced radioactive waste
◎ Enhanced operability and maneuverability

Significance of Full MOX-ABWR

The Ohma Nuclear Power Plant is capable of using both uranium fuel and the MOX fuel produced by reprocessing spent fuel. We call it "full MOX-ABWR" because it can operate with a fuel core consisting entirely of MOX fuel. The percentage of MOX fuel used will gradually be increased to 100%. While the reactor has the same basic specifications as those of the conventional uranium-fuel reactor, the equipment features listed below have been incorporated into design modifications to ensure complete safety.

◎ Increasing the capacity of standby liquid control systems
◎ Enhancing the neutron absorbing effect of some control rods
◎ Increasing the capacity of main steam safety relief valves
◎ Adoption of MOX fuel inspection devices

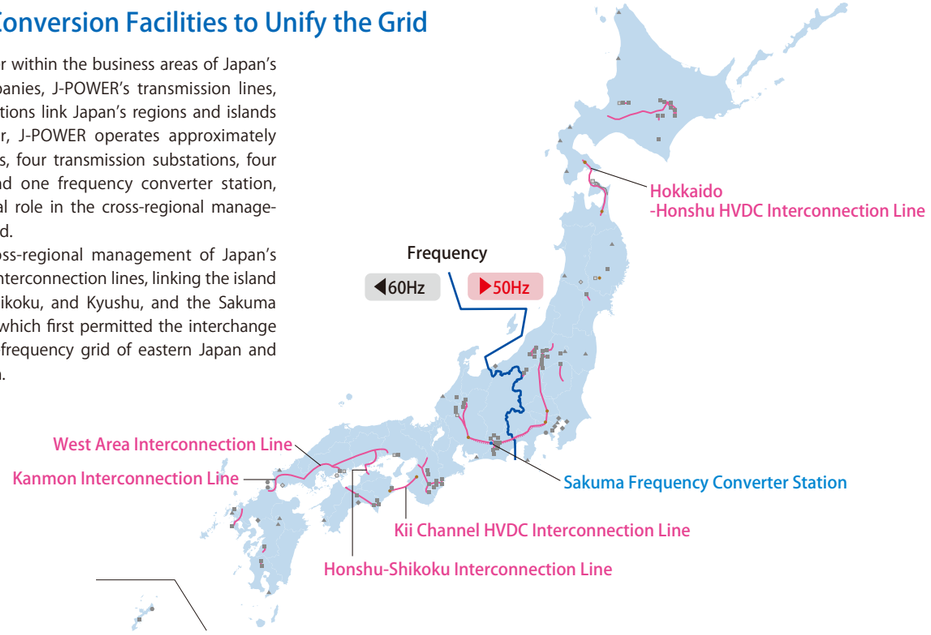
(See our website at http://www.jpower.co.jp/bs/field/gensiryoku/index.html for the latest information on the construction of Ohma Nuclear Power Plant.)

Transmission Infrastructure

Contributing to the Cross-Regional Management of Japan's National Grid

Transmission and Conversion Facilities to Unify the Grid

In addition to delivering power within the business areas of Japan's regional electric power companies, J-POWER's transmission lines, converter stations, and substations link Japan's regions and islands with one another. Altogether, J-POWER operates approximately 2,400 km of transmission lines, four transmission substations, four AC/DC converter stations, and one frequency converter station, infrastructure that plays a vital role in the cross-regional management of Japan's nationwide grid.
Particularly crucial to the cross-regional management of Japan's electric power supply are our interconnection lines, linking the island of Honshu with Hokkaido, Shikoku, and Kyushu, and the Sakuma Frequency Converter Station, which first permitted the interchange of power between the 50-Hz-frequency grid of eastern Japan and the 60Hz-grid of western Japan.



Sakuma Frequency Converter Station: Linking Eastern and Western Japan

The Sakuma Frequency Converter Station (maximum capacity 300 MW) was built to facilitate efficient management of the nation's power supply by permitting the interchange of electricity between Japan's eastern and western power networks, which operate at different frequencies. It was the first large-scale frequency converter of its kind. In June 2016, the Organization for Cross-Regional Coordination of Transmission Operators adopted the Cross-Regional Network Development Plan for Interconnection Facilities Between Tokyo and Chubu. In accordance with this blueprint, J-POWER is planning to increase the capacity from 300 MW to 600 MW.


Sakuma Frequency Converter Station (Hamamatsu City)

Honshu-Shikoku Interconnection Line: Linking Honshu and Shikoku

The Honshu-Shikoku Interconnection Line is a 500 k-volt transmission line installed along the Honshu-Shikoku bridge system that spans the Seto Inland Sea. Connecting with the main transmission lines of Honshu and Shikoku, it helps maintain a stable supply of power in western Japan.


Honshu-Shikoku Interconnection Line
(Okayama Prefecture・Kagawa Prefecture)

Communications and Other Operations

Communications Network

J-POWER maintains a communications network connecting its electric power facilities around Japan, mainly via microwave radio and fiber optic links. The data communicated across this network is used in our transmission line protection system, remote monitoring and control of power stations, and other systems that support the stable operation and management of our electric power facilities.
J-POWER's microwave radio relay stations are vital communications infrastructure linking J-POWER's power stations, substations, and other facilities. They create a highly reliable network that ensures uninterrupted communication even during earthquakes, typhoons, or other natural disasters.


Odanosawa Microwave Radio Relay Station (Aomori Prefecture)

Diversified Operations

Water Environment and Energy-Saving Infrastructure

In the water-environment segment, J-POWER has taken part in two PFI projects relating to public waterworks: the Samukawa Water Purification Plant wastewater treatment project (Kanagawa Prefecture) and the Chiba Nogiku-no-Sato Purification Plant wastewater treatment project (Chiba Prefecture). We also offer optimal water-treatment solutions for such institutions as universities and hospitals, including on-site groundwater purification services.
In the area of energy-saving infrastructure, J-POWER has provided consulting services for district heating systems in Japan and overseas. Armed with this know-how, J-POWER has entered into a joint district cooling project in the United Arab Emirates, becoming the first Japanese power company to participate in such an undertaking in the Middle East.


Ishima Small-scale Waterworks (Tokushima Prefecture), Anan City

Underground Engineering

J-POWER has accumulated wide-ranging engineering expertise by handling every phase of power-station development, from planning and preconstruction surveys to plant design, application for permits and licenses, contracting, construction supervision, and operational management and control. Power-station development entails the construction of numerous tunnels and underground cavities. Much of the know-how we have developed in the process—including the (techniques of) underground environment monitoring, structural design of large-scale the use of tunnels and underground caverns, and groundwater flow analysis—is being put to use in the design and construction of underground rock cavern for pettoleum and liquefied petroleum gas reserves and in the development of compressed air energy storage systems. We intend to continue accumulating experience and expertise in the use of tunnal and underground cavern so as to offer ever more advanced engineering services.


Kushikino National Petroleum Stockpiling Base (Kagoshima Prefecture), Japan Oil, Gas, and Metals National Corporation

J-POWER's Global Business Operations

J-POWER's extensive experience and track record within Japan have laid the foundation for overseas business operations going back more than 50 years. Moving forward, we will continue extending our global reach in a manner consistent with our corporate philosophy: Playing our part for the sustainable development of Japan and the rest of the world.

Overseas Power Generation Projects (as of March 31, 2016)

In operation	36
Under construction or being planned	1

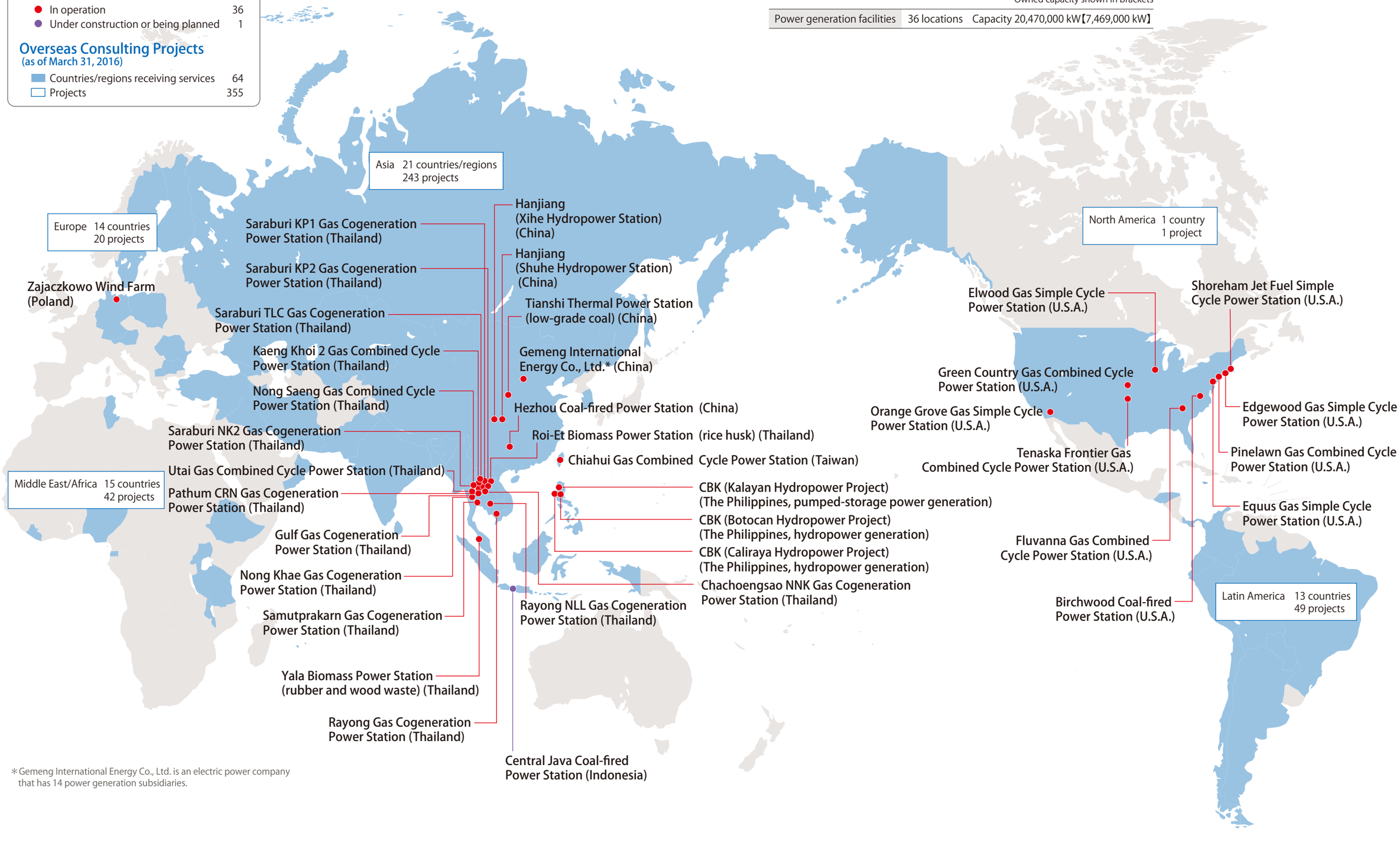
Overseas Consulting Projects (as of March 31, 2016)

Countries/regions receiving services	64
Projects	355

J-POWER Group Facilities (as of March 31, 2016)

Owned capacity shown in brackets

Power generation facilities	36 locations	Capacity 20,470,000 kW【7,469,000 kW】



*Gemeng International Energy Co., Ltd. is an electric power company that has 14 power generation subsidiaries.

Overseas Consulting Business

Overview

For more than 50 years J-POWER has been providing consulting services around the world in connection with development of electric power studies, design and construction supervision of generation and transmission facilities. From 1962, the year of our first project, to March 31, 2016, we undertook 355 projects in 64 countries and territories.
The core of J-POWER's overseas consulting business is technical support for specific international cooperation projects. Commissioned by the Japanese government (Japan International Cooperation Agency, etc.), J-POWER completes baseline studies, feasibility studies, preliminary designs, and other government-funded projects in conjunction with Japan's technical assistance program. We are also involved in commercial business undertakings abroad, including execution design and construction supervision, under direct contract with foreign government agencies or private corporations.

Chronology of Major Overseas Consulting Projects

1960	Revision of the Electric Power Development Promotion Law Commencement of overseas consulting services
1962	Tacna Hydropower Project (Peru) The first consulting services provided on a commercial basis
1967	Srinagarind Hydropower Project (Thailand)
1969	Hasan Ugurlu Hydropower Project (Turkey)
1971	Lima Chimbote Transmission Line Project (Peru) Consulting services for large-scale power transmission
1974	Thermal Power Project (The Philippines) The first consulting services for thermal power generation
1982	Port Kelang Phase II Thermal Power Project (Malaysia) Consulting services for large-scale coal-fired power generation
1984	Technical assistance on NOx emission reductions (Austria) Environmental conservation project in Europe
1985	Tianshengqiao Hydropower and Transmission Project (China)
1990	Lam Ta Khong Pumped Storage Power Project (Thailand) Consulting services for pumped storage power generation Purulia Pumped Storage Power Project (India)
1994	Ham Thuan Dami Hydropower Project (Vietnam) Bakreswar Thermal Power Project (India)
1996	Yuncan Hydropower Project (Peru)
2003	Upper Kotmale Hydropower Project (Sri Lanka)
2007	Study on promotion of energy saving measures (Indonesia) Consulting services for energy efficiency and conservation
2008	Nghi Son Thermal Power Project (Vietnam)
2011	Nationwide master plan study on storage-type hydropower generation (Nepal)
2012	Ayago Hydropower Project (Uganda)
2013	Don Duong Pumped Storage Power Project (Vietnam)
2014	High-efficiency and Eco-friendly Coal-fired Power Project (Sri Lanka)
2015	Ulan Bator No.4 Power Station Optimization Project (Mongolia)


Bakreswar Thermal Power Station (India)


Upper Kotmale Hydroelectric Power Station (Sri Lanka)


Nghi Son Thermal Power Station (Vietnam)

Overseas Power Generation Business

Overview

Applying the knowledge and technical capabilities developed through our domestic operations and leveraging the experience, trust, and networks we have built up through our overseas consulting projects, J-POWER has been actively seeking out and developing commercial power generation projects overseas. As of March 31, 2016, we had 36 facilities in six countries · regions, representing a combined generation capacity of 20.47 GW (7.5 GW owned capacity).
J-POWER intends to expand the businesses it has so successfully developed in countries like Thailand and the United States, while actively extending its reach into new markets.

United States

A decade has gone by since J-POWER established its first power generating business in the United States by acquiring a controlling interest in Tenaska Frontier Partners. Since then, we have expanded our US operations step by step through investments, acquisitions, and development of power facilities. Today J-POWER is involved in 10 US projects representing a combined capacity of 4.49 GW (owned capacity 1.44 GW).
As current power-purchase agreements expire or enter into extension negotiations, J-POWER will take the opportunity to move into the wholesale market, while continuing to explore new development opportunities.


Orange Grove Power Station (California, U.S.A.)

Thailand

Building on the track record of its overseas consulting projects, J-POWER is participating in multiple power generation projects in Thailand. These include not only large-scale baseload power sources but also plants that run on biomass fuel made from rice husk and gas cogeneration facilities. Nine power stations started up between 2013 and 2015, bringing the number of J-POWER generation projects in Thailand to 16.
With the launch of commercial operations at U-Thai Power Station (capacity 1.6 GW) in 2015, J-POWER facilities account for approximately 10 percent of Thailand's total installed generation capacity.


U-Thai Power Station (Thailand)

Financial Information

Consolidated Balance Sheet (as of March 31, 2016)

◎Assets

Unit: millions yen

	as of Mar. 31, 2015	as of Mar. 31, 2016
Noncurrent assets	2,275,453	2,237,836
Electric utility plant and equipment	986,552	952,230
Overseas business facilities	264,800	357,448
Other noncurrent assets	115,111	101,827
Construction in progress	506,967	444,814
Nuclear fuel	71,467	73,447
Investments and other assets	330,555	308,067
Current assets	383,695	308,436
Total assets	2,659,149	2,546,272

◎Liabilities and Net assets

Unit: millions yen

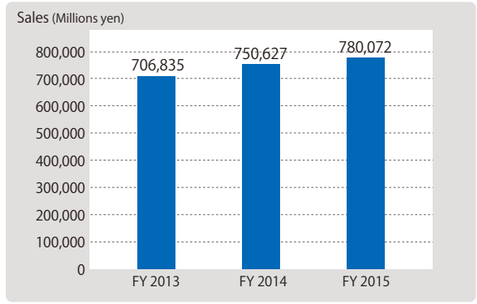
	as of Mar. 31, 2015	as of Mar. 31, 2016
Noncurrent liabilities	1,633,825	1,561,072
Current liabilities	329,025	304,100
Reserves under the special laws	—	116
Total liabilities	1,962,851	1,865,289
Shareholders' equity	629,463	656,367
Accumulated other comprehensive income	59,268	15,775
Non-controlling interests	7,566	8,839
Total net assets	696,298	680,982
Total liabilities and net assets	2,659,149	2,546,272

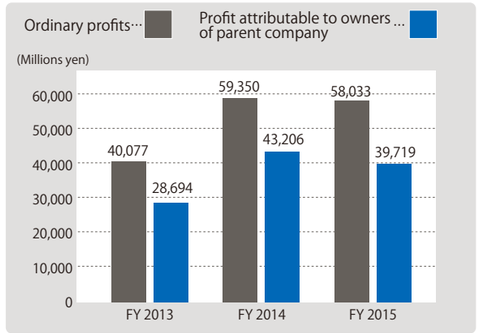
Consolidated Statements of Income (from April 1, 2015 to March 31, 2016)

Unit: millions yen

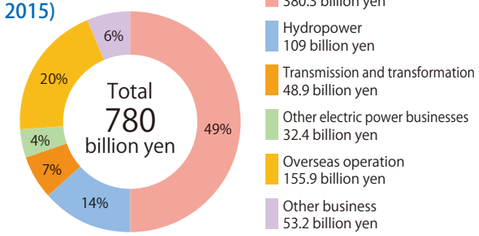
	Year ended Mar. 31, 2015	Year ended Mar. 31, 2016
Operating revenue	750,627	780,072
Operating expenses (operating income)	677,767 (72,859)	692,695 (87,376)
Non-operating income	22,714	17,871
Non-operating expenses	36,223	47,214
Total ordinary revenue	773,341	797,944
Total ordinary expenses	713,991	739,910
Ordinary income	59,350	58,033
Provision or reversal of reserve for fluctuation in water levels	△119	116
Extraordinary income	2,127	—
Profit before income taxes and minority interests	61,598	57,917
Income taxes-current	7,468	12,821
Profit	44,212	40,178
Income tax – deferred	9,917	4,916
Profit attributable to non-controlling interests	1,005	459
Profit attributable to owners of parent company	43,206	39,719

◎Sales and earnings (consolidated)





Consolidated Sales Breakdown (FY 2015)



- Thermal power 380.3 billion yen
- Hydropower 109 billion yen
- Transmission and transformation 48.9 billion yen
- Other electric power businesses 32.4 billion yen
- Overseas operation 155.9 billion yen
- Other business 53.2 billion yen

Consolidated Statement of Cash Flow (from April 1, 2015 to March 31, 2016)

Unit: millions yen

	Year ended March 31, 2015	Year ended March 31, 2016
Net cash provided by (used in) operating activities	147,813	146,164
Net cash provided by (used in) investing activities	△ 142,964	△ 131,575
Net cash provided by (used in) financing activities	143,920	△ 88,632
Effect of exchange rate changes on cash and cash equivalents	2,446	△ 2,446
Net increase (decrease) in cash and cash equivalents	151,216	△ 76,490
Cash and cash equivalents at beginning of period	85,223	236,439
Cash and cash equivalents at end of period	236,439	159,949

Electricity Sales (FY 2015)

Amount of electricity sold: 81.215 TWh＊　＊Excluding the amount generated by pumped storage power

Corporate Data

Corporate profile

Business category	Electricity Utility
Date of incorporation	September 16, 1952
Head Office	6-15-1 Ginza, Chuo-ku, Tokyo 104-8165, Japan Tel: 81-3-3546-2211
Capital Million JPY	180,502
Employees	2,360 (as of March 31, 2016)
Website	http://www.jpower.co.jp
E-mail	webmaster@jpower.co.jp

Directors (as of June 22, 2016)

Chairman	Masayoshi Kitamura
President	Toshifumi Watanabe
Representative Executive Vice Presidents	Hitoshi Murayama Masato Uchiyama Junji Nagashima Shuji Eto
Executive Managing Directors	Itaru Nakamura Yoshiki Onoi Akihito Urashima Hiromi Minaminosono Hiroyasu Sugiyama
Executive Director	Go Kajitani Tomonori Itou John Buchanan
Senior Corporate Auditors	Akira Samata Hiroshi Fujioka Naori Fukuda
Corporate Auditors	Mutsutake Otsuka Kiyoshi Nakanishi

Major Overseas Subsidiaries (as of April 1, 2016)

- J-POWER USA Development Co., Ltd. (U.S.A.)
- J-POWER Generation (Thailand) Co., Ltd. (Thailand)
- J-POWER Consulting (China) Co., Ltd. (China)

Major Group Companies (as of April 1, 2016)

Company name	Location	Telephone/website	Main business activities
JP Business Service Corporation	Koto-ku, Tokyo	03-3642-9771 http://www.jpbs.co.jp	Welfare facility management, building maintenance services, administrative and labor services, computer software development, etc.
JPHYTECH Co., Ltd.	Chiyoda-ku, Tokyo	03-3237-2323 http://www.jphytec.co.jp	Construction, engineering, design, consulting and maintenance inspections of hydropower stations, transmission lines and substations; real estate indemnity; land survey; civil engineering work; general architecture; project management, etc.
JPec Co., Ltd.	Chuo-ku, Tokyo	03-5203-0361 http://www.jpec.co.jp	Construction, engineering, design, consulting and maintenance inspections of thermal and nuclear power stations; unloading and transportation of coal for thermal power stations; sales of fly ash; marine transportation of coal for power generation; research and planning for environmental conservation, etc.
KEC Corporation	Bunkyo-ku, Tokyo	03-3816-8211 http://www.kec.co.jp	Construction and maintenance of electronic and telecommunication facilities, etc.
JP Design Co., Ltd.	Chiyoda-ku, Tokyo	03-3255-6211 http://www.jpde.co.jp	Construction consulting services; design and supervision of power generation facilities and general architecture; geological and other surveys, etc.
J-POWER EnTech, Inc.	Minato-ku, Tokyo	03-3434-7081 http://www.jpower.co.jp/entech	Development of facilities for removal of air and water pollutants, etc.
KAIHATSU HIRYOU CO., Ltd.	Takehara City, Hiroshima Prefecture	0846-24-1601 http://www.jpsik.com	Production and sales of fertilizers originated coal ash, etc.

Electric Power Development Co., Ltd.
6-15-1 Ginza, Chuo-ku, Tokyo 104-8165, Japan
Tel. : 81-3-3546-2211
http://www.jpower.co.jp

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