



Since its establishment by the government in 1952 to overcome the power shortages in postwar Japan, J-POWER (Electric Power Development Co., Ltd.) has developed its business in the wholesale supply of hydroelectric and thermal power, conducted a power transmission business through its trunk transmission lines that connect each domestic region, and contributed to the stable supply of electric power in Japan.

Listed on the Tokyo Stock Exchange's First Section and thus becoming fully privatized in 2004, J-POWER has been developing new businesses, including electric power generation businesses in foreign countries where growth is expected, and renewable energy, such as wind and geothermal power.

Currently, Japanese power companies are facing a variety of business circumstances, including electricity system reform, but, by making the most of its expertise regarding leading-edge technologies developed throughout the world and its proven record of trustworthy performance, J-POWER is making steady and farsighted progress on the basis of its "coexistence of energy and the environment" concept.

#### J-POWER's History

#### Trends in J-POWER's Power Generation Capacity Power Generation Capacity (MW) 25,000 — November 1972 Began operating Shintoyone Power Plant (1,125 MW), J-POWER's first large-scale pumped storage hydroelectric power plant with a capacity over 1,000 MW October 1965 September 1952 Began operating the Sakuma Frequency 20,000 — J-POWER established as a Converter Station to link the different January 1981 government-funded company frequencies of eastern and western Japan Began operating Matsushima Thermal based on the "Electric Power Power Plant No. 1 (500 MW), Japan's **Development Promotion Law** first power plant fueled primarily with (Law No. 283 of July 31, 1952)" imported coal. No. 2 (500 MW) began operations in June of that year Developing overseas consulting business 15,000 — November 1962 Provided consulting services December 1979 for the Tacna Hydropower Began operating the Kitahon HVDC Link Project in Peru, the starting between Hokkaido and Honshu point of overseas consulting operations 10,000 — April 1956 Development of thermal power plants fueled by domestic coal Development of thermal powe Began operating the plants fueled by imported coa Sakuma Power Plant as J-POWER's first large-scale hydroelectric power plant (350 MW) 5,000 — 1965 1970 1985 1990 1950 1955 1960 1975 1980 1995

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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.

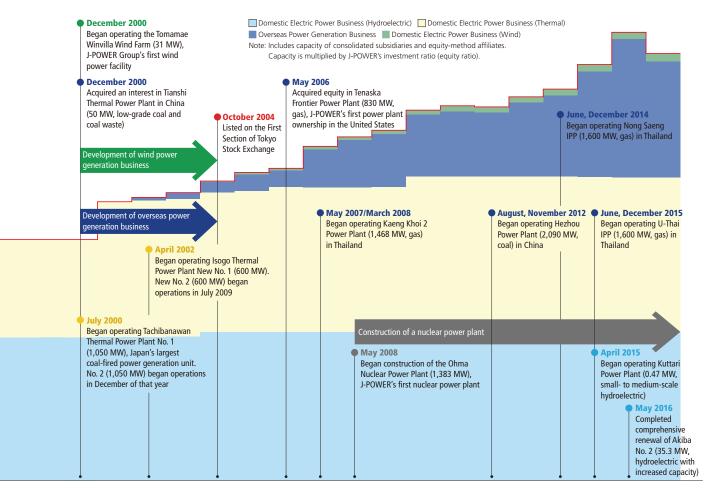


We value integrity and pride, which drive everything we do.

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.



2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017

(As of March 31)

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#### Forward-Looking Statements

Statements in this annual report, other than those of historical fact, are forward-looking statements about the future performance of J-POWER that are based on management's assumptions and beliefs in light of information currently available, and involve both known and unknown risks and other uncertainties. Actual events and results may differ materially from those anticipated in these statements.

# Presentation of Monetary Amounts and Other Figures For monetary amounts and electric power sales, figures less than the indicated unit are rounded down. For other amounts, figures less than the indicated unit are rounded to the nearest unit unless otherwise mentioned.

## Consolidated Power Generation Capacity in Operation (Owned Capacity Basis)

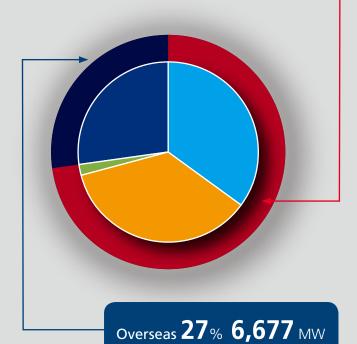
(As of April 1, 2017)

Note: Includes capacity of consolidated subsidiaries and equity-method affiliates.

Owned capacity is calculated by multiplying the capacity of each facility by J-POWER's equity ratio.

## Domestic **73**% **17,862** MW

Hydroelectric Power	8,571 MW	35%
Thermal Power	8,852 MW	36%
Wind Power	439 MW	2%



Thailand	3,300 MW
United States	1,785 MW
China	936 MW
Other areas	656 MW

# J-POWER Group's Electric Power Business— Supporting the Stable Supply of Electric Power in Japan

#### **Domestic**

J-POWER's core business is its electric power generation business, comprising the power plants it owns and operates throughout Japan that supply electricity to electric power retailers based on contracts that set out the generating capacity/electric power and fees for each retailer. We also employ our transmission and transforming facilities to provide transmission services, based on contracts with each company.



Isogo Thermal Power Plant (Kanagawa Prefecture)

## **Global Business Development**

#### **Overseas**

J-POWER is leveraging its more than 50 years of overseas achievements and know-how as it engages in its overseas power generation business and overseas consulting business. J-POWER is contributing to the stable supply of electric power and sustainable development throughout the world.



U-Thai IPP (Thailand)

#### **Electric Power Business**

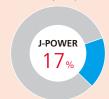
#### Hydroelectric Power

#### Purely Domestic, CO<sub>2</sub>-Free Energy

J-POWER owns 61 hydroelectric power plants with a total capacity of 8,571 MW, making it Japan's second-ranked company in terms of hydropower generation capacity. Hydroelectric power represents a valuable purely domestic energy resource and, as a CO2-free power source, plays a central role in renewable energy.

#### Share of Hydroelectric **Power Generation** Capacity in Japan

(As of March 31, 2017)



Sources: Compiled from Electric Power Survey Statistics (Agency for Natural Resources and Energy) and other sources

#### ■ Wind Power

#### Power Generation Business for a Low-Carbon Society

J-POWER owns 22 wind power facilities with a total capacity of 439 MW, making it Japan's second-ranked company in terms of wind power generation capacity. Because wind power is a clean, CO2-free power source and a form of renewable energy, J-POWER will continue promoting new wind power development going forward.

#### **Share of Wind Power Generation Capacity** in Japan

(As of March 31, 2017)



Sources: Compiled from Electric Power Survey Statistics (Agency for Natural Resources and Energy) and other sources

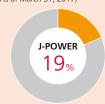
#### Thermal Power

#### Highly Economical Base Energy Source

J-POWER owns thermal power generation facilities with a total capacity of 8,852 MW, including the top share of coal-fired thermal power generation capacity in Japan (an owned capacity of 8,544 MW). The special feature of coal-fired thermal power generation is the lower cost per calorie compared with power generation by crude oil, LNG, and other fossil fuels. Reflecting the use of coal-fired facilities to meet base demand, they have high capacity load factors and can be said to be outstanding sources of power in terms of economy.

#### Share of Coal-Fired **Power Generation** Capacity in Japan

(As of March 31, 2017)



Sources: Compiled from Electric Power Survey Statistics (Agency for Natural Resources and Energy) and other sources

#### Transmission/Transformation

#### Core Infrastructure Supporting Japan's Electric Power Network

J-POWER has major transmission lines with a total length of approximately 2,400 km, including trunk lines that connect Honshu with Hokkaido, Shikoku, and Kyushu. We also own a frequency converter station that links the different frequencies of eastern and western Japan. These facilities are key infrastructure elements that play extremely important roles in the comprehensive management of Japan's nationwide power grid.

#### **Overseas Power Generation Business**

From the late 1990s, J-POWER has been working on its overseas power generation business, which invests the Company's funds and technology and participates in electric power generation projects. As of April 1, 2017, the J-POWER Group owns power generation facilities that are in operation in six countries and regions, including Thailand, the United States, and China. These facilities have a total capacity of 6,677 MW (owned capacity basis). Furthermore, the Company is advancing newly developed projects in Indonesia (total output of 2,000 MW, planned for completion in 2020) and in the United States (total output of 926 MW, planned for completion in 2018).

#### **Overseas Consulting Business**

J-POWER has conducted its overseas consulting business, which involves technical cooperation related to electric power development and environmental preservation, since the 1960s. As of April 1, 2017, the Company has executed a cumulative total of 357 projects in 64 countries and regions.

#### Overseas power generation business

(As of April 1, 2017)

• In operation		6 countries/ regions	36 projects	Owned capacity 6,677 MW
	O Under construction/ planned	2 countries	2 projects	Owned capacity 912 MW

#### Overseas consulting service projects

(As of April 1, 2017

64 countries/ 357 projects regions

Overseas power generation business In operation 1 country · 24 MW Consulting service projects 14 countries · 20 projects

Middle Fast/Africa

Consulting service projects
15 countries · 42 projects

#### Asia Overseas power generation business In operation 4 countries/regions 4 868 MW Under construction/planned 1 country · 1 project 680 MW Consulting service projects 21 countries/regions 245 projects

#### **North America**

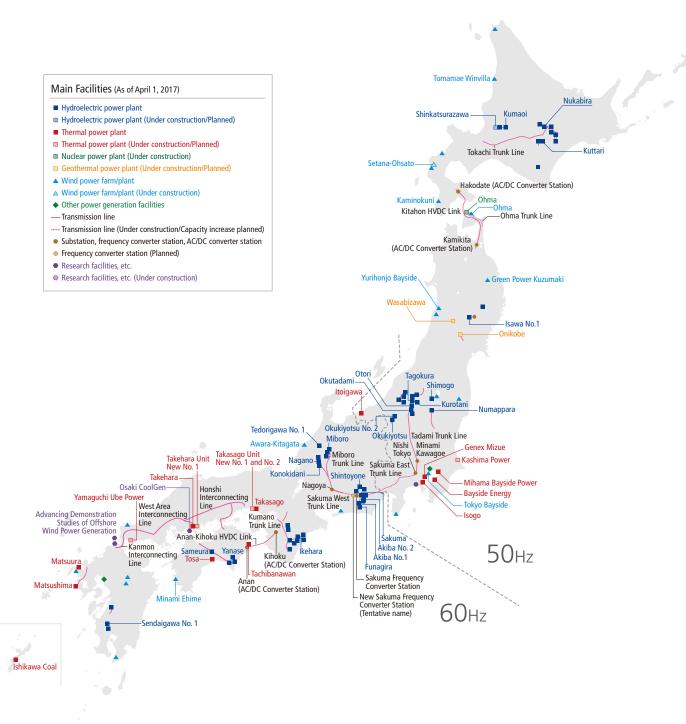
Overseas power generation business In operation 1 country · 1,785 MW Under construction

1 country · 1 project 232 MW Consulting service projects 1 country · 1 project

> Central and South America Consulting service projects
> 13 countries · 49 projects

Through its ownership and operation of power plants with a total capacity of 17,862 MW,\* transmission lines extending approximately 2,400 km, and substations, the J-POWER Group plays a vital role in maintaining a stable supply of electric power throughout Japan.

\* Owned capacity, calculated by multiplying each facility's total capacity by J-POWER's investment ratio (equity ratio).



#### **Domestic Electric Power Business Facilities (In Operation)**

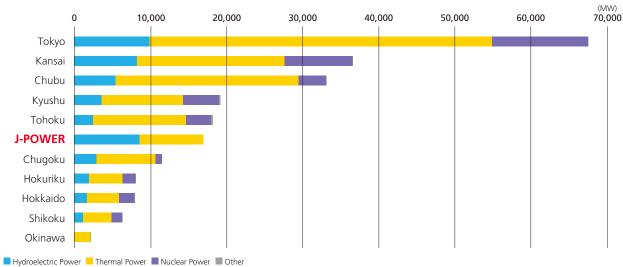
(As of April 1, 2017)

J-POWER Facilities	No. of Faciliti	es
Power generation facilities		
Hydroelectric power plants	61	8,571 MW
Thermal power plants*	12	9,140 MW
Wind power farms/plants*	22	440 MW
Other power generation facilities	2	32 MW
Total	97	18,189 MW
Transmission lines		2,410.2 km
AC power transmission lines		2,143.0 km
DC power transmission lines		267.2 km
Substations	4	4,301 MVA
Frequency converter station	1	300 MW
AC/DC converter stations	4	2,000 MW
Wireless communication facilities (circuit length)		5,911 km

<sup>\*</sup> Not taking investment ratio (equity ratio) into account

#### Power Generating Capacity of J-POWER and 10 Electric Power Companies (EPCOs)

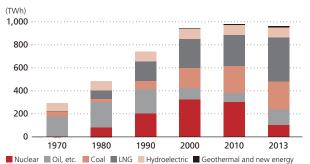




Sources: Compiled from *Electric Power Survey Statistics* (Agency for Natural Resources and Energy) and other sources

#### Power Generation by Power Source in Japan

While hydroelectric power previously accounted for the bulk of electric power generating capacity in Japan, there was later a shift to the use of thermal power fueled by abundant and inexpensive oil. Since the oil shocks, the development of coal-fired and natural gas-fired thermal power generation as well as nuclear power has advanced, and efforts have been made to diversify power generation methods. The operation of nuclear power plants in Japan was suspended for a long time after the accident at the Fukushima Daiichi Nuclear Power Plant in 2011. Although a start has been made on a gradual recommencement of nuclear power plant operations, coal and gas-fired thermal power remains the main pillar of electricity supply in Japan.



Note: Figures for oil, etc., include figures for LPG, other kinds of gas, and bituminous substances (including power received). Figures for total power generation volume are for the 10 EPCOs (including power received).

Source: Agency for Natural Resources and Energy



Actively advancing initiatives toward the achievement of our Medium-Term Management Plan, we will ensure the further growth of the J-POWER Group.

Looking at Japan's electric power industry, in July 2015 the Japanese government published its *Long-Term Energy Supply and Demand Outlook* and presented its energy-mix targets for 2030. The government is also steadily advancing its electricity system reform, including the full-scale liberalization of retail business and the abolishment of wholesale regulations, which were started in April 2016, as well as the unbundling of power generation and transmission scheduled for 2020. In addition, the Paris Agreement has come into effect, and the business environment surrounding the J-POWER Group has undergone significant changes, including demands for efforts to be made in Japan to further reduce greenhouse gas emissions.

Based on these kinds of changes in its business environment and on its own strengths, in July 2015, the J-POWER Group established a Medium-Term Management Plan to address the challenge of achieving further growth over the next decade. As for the direction of the plan, there are three concepts:

"Realize growth in Japan by surviving the competition in a liberalized market," "Enhance overseas business expansion," and "Further low-carbon technologies enabling greater business growth globally," and we are actively promoting initiatives to give the direction these concepts are taking some tangible form.

Specifically, in addition to the large-scale, coal-fired thermal power generation projects currently under construction, such as Takehara and Kashima in Japan and in Central Java overseas, we are implementing several wind power, geothermal, and hydroelectric projects in the field of renewable energy and making steady progress in asset formation aimed at future growth. Furthermore, the oxygen-blown IGCC demonstration project, the next-generation, coal-fired thermal power generation technology, started operations in March. In the years to come, it is our intention to ensure the ongoing steady growth of the J-POWER Group through the discovery and promotion of even more superior projects in Japan and abroad.

We will continue to do our utmost under our Corporate Philosophy: "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."

We are grateful as always for your continued support and patronage.

Toshifumi Watanabe President September 2017



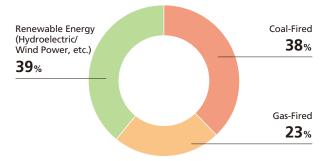
#### The Current J-POWER

## Q Could you please tell us about the distinctive features of J-POWER at this time?

A: Since its foundation in 1952 up to the present day, the J-POWER Group has been developing large-scale hydroelectric power plants and thermal power plants in Japan, and in recent years has also actively engaged in overseas power generation and the renewable energy business, such as domestic wind power generation businesses. As contained in its Corporate Philosophy, the Group has continued to provide the energy that people want and contributed to the sustainable development of Japan and the rest of the world. Currently, these power generation facilities have grown to approximately 25 GW in Japan and overseas, of which domestic power generation facilities account for around 18 GW; half of these are large-scale hydroelectric power generation and wind power generation, and the other half is coal-fired thermal power generation. Overseas power generation facilities are at around the 7 GW level and are owned in Asian countries, including Thailand, and the United States, and approximately 80% of the overseas thermal power generation is gas-fired. In the power transmission business, we also own cross-regional connecting lines that connect Honshu with each of Hokkaido, Shikoku, and Kyushu, a frequency converter station to connecting the regions with different frequencies, and other such power grid facilities.

I think that people have gained the impression that J-POWER's core business is coal-fired thermal power generation. However, as I mentioned, domestic coal-fired thermal power and renewable energy, such as hydroelectric and wind power generation, and overseas gas-fired thermal power generation form the core, and I think that, in Japan and abroad, the J-POWER Group as a whole has a well-balanced power generation facility structure.

## Composition of J-POWER Group Electric Power Generation Assets in Japan and Overseas by Fuel



#### Response to Electricity System Reform

Q Over a year has passed since the full-scale liberalization of retail business, and the abolishment of wholesale regulations was implemented in April 2016. How will you adapt to the competitive environment that liberalization is bringing?

A: Although market competition in the power generation business field has been hastened by the electricity system reform, as a power generator, J-POWER has to compete with other power generators and survive against that competition. In the case of the J-POWER Group's domestic power generation facilities, coal-fired thermal power generation, which is inexpensive and capable of stably procuring fuel compared to oil and LNG (liquefied natural gas), and large-scale hydroelectric power generation, which is a form of renewable energy, account for the majority. We thus possess sufficient cost-competitiveness, which is the key to surviving against market competition that is gaining momentum. Amid intensifying market competition, the J-POWER Group is targeting further growth armed with a wealth of cost-competitiveness. To that end, it will be necessary to work to stably bring about the maximum operation of cost-competitive facilities, to reduce risks and expand returns. We will continuously work to further improve the operation and maintenance technologies that the J-POWER Group has accumulated. We will also steadily develop new coal-fired thermal power plants, such as the Takehara replacement facility and Kashima.

# Q Please tell us about the importance of J-POWER's power distribution facilities while the electricity system reform is progressing.

A: The robust competitive market aimed for with the electricity system reform will only be realized when the wide-area power distribution network is functioning well. We are endeavoring to maintain the sound function of the Company's distribution facilities, including our cross-regional connecting lines and frequency converter station, the part of that network for which we are responsible. From the viewpoint of maintaining distribution facilities over a wide area, in 2016, we were also selected as the main contractor for increasing the capacity of the Sakuma frequency converter facility (now 300 MW→600 MW) and related transmission lines. At the present time, we are conducting investigations toward the start of construction.



# Expanding Installation of Renewable Energy

Q You mentioned earlier that large-scale hydroelectric power generation and wind power generation, which are sources of renewable energy, account for most of the J-POWER Group's power generation assets. Will there be continued expansion in the Group's renewable energy assets and business in the years to come?

A: The development of large-scale, reservoir-type hydroelectric power stations, which J-POWER has been developing since its foundation, will be difficult in Japan going forward. In contrast, we are working on the utilization of hydroelectric resources, which represent purely domestic CO<sub>2</sub>-free energy, through the development of small- and medium-sized hydroelectric power generation projects that utilize untapped river flows and unused heads of water and by increasing the capacity of existing power plants. In December 2016, we commenced operation of the Konokidani Hydroelectric Power Plant, a small-sized hydroelectric



Minami Fhime Wind Farm

power generation project that utilizes the large dam reservoir and the head of water from the water inlet. In addition, at the Akiba No. 2 Power Plant, we also conducted repowering, which increases capacity by the installation of the latest technologies, in accordance with the comprehensive renewal of major facilities.

In the case of wind power generation, the Ohma Wind Farm, Yurihonjo Bayside Wind Farm, and Minami Ehime Wind Farm (increased capacity) all commenced operations in fiscal 2016.

Currently, our domestic-owned capacity has expanded to about 440 MW, making J-POWER the second-largest wind power producer in the country. In addition, construction work is proceeding at the Setana-Ohsato, Kuzumaki No. 2, and Nikaho No. 2 sites, and new development of 136 MW is being advanced at these three officially announced sites alone. In addition, in Hibikinada, in the city of Kitakyushu, Fukuoka Prefecture, we established a special-purpose company in cooperation with other companies with the intention of bringing an offshore wind power generation project to fruition.

The J-POWER Group now has a more than 40-year record of operating geothermal power plants. In addition to the construction work on the Wasabizawa Geothermal Power Plant—a jointly funded project with Mitsubishi Materials Corporation and Mitsubishi Gas Chemical Company, Inc., which is proceeding smoothly as a new development—we are planning to replace the Onikobe Geothermal Power Station, which had been operating until March 2017, and we are proceeding with environmental assessment procedures.

We are also working to expand the use of biomass fuels in our plans to reduce  $CO_2$  emissions by producing solid fuel from, for example, waste, sewage sludge, and woodchips, and co-firing them at coal-fired thermal power plants.

In such ways as described above, the J-POWER Group will continue to proactively develop renewable energy through its abundant operational experience and the installation of the latest technologies.

## Business Development Based on Japan's Energy Mix

Q With coal-fired thermal power generation, the carbon dioxide (CO<sub>2</sub>) emissions volumes are greater than other methods of power generation, and harsh opinions with regard to coal-fired thermal power generation are also being heard both in Japan and abroad.

#### Based on the energy mix, what do you think about the future of coal-fired thermal power generation?

A: It is essential for domestic resource-poor Japan, which has an energy self-sufficiency rate of 7.0%\* and relies on imports for most of its fossil fuels, to utilize diverse sources of energy in a well-balanced manner. Even in the energy mix that Japan is targeting for fiscal 2030, it is assumed that the use of coalfired thermal power generation will account for 26%. That is because, as a widely produced resource with extensive reserves throughout the world that presents the lowest geopolitical risk, coal is a resource that is important for Japan's energy security. Furthermore, as coal can be stably procured at the lowest prices upon arrival in Japan, coal-fired thermal power generation fulfills the role of an excellent baseload power source. It is true, however, that coal produces a greater volume of CO<sub>2</sub>, a greenhouse gas, than other fossil fuels. The government's Long-Term Energy Supply and Demand Outlook says about fossil fuels that it will "Realize higher efficiency of coal-fired and LNGfired thermal power generation, and promote their effective utilization, while ensuring compatibility with the reduction of environmental load."

The electricity industry is building a voluntary framework so that the industry as a whole will be able to reach the CO<sub>2</sub> reduction target. To support these efforts, the government is creating and adjusting legal rules for power generators and retailers with the aim of securing effectiveness and transparency. As part of the electricity industry, the J-POWER Group is working to fulfill its responsibilities under this framework.

Accordingly, as the J-POWER Group, I would like us to focus our efforts on reducing carbon emissions from coal-fired thermal power generation.

\* Fiscal 2015 estimated value Source: Energy White Paper 2017 (Agency for Natural Resources and Energy)

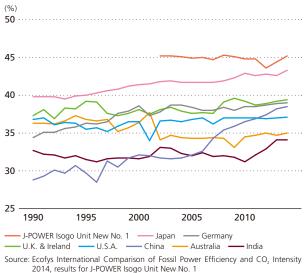
# Q Could you please tell us about your specific approaches to reducing the carbon emissions from coal-fired thermal power generation?

A: Currently, to reduce CO<sub>2</sub> emissions from its coal-fired thermal power generation operations, the J-POWER Group is advancing the replacement of its aging power generation facilities, such as those at the Takehara and Takasago plants, with new, high-efficiency, coal-fired thermal power generation facilities. For new projects, such as the Kashima Power and Yamaguchi Ube

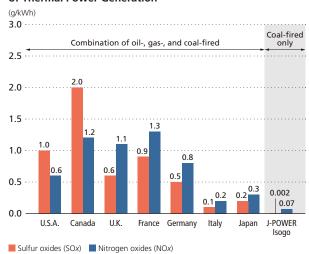
Power projects, we are adopting high-efficiency power generation technologies currently being commercialized.

In addition, in March 2017, we started a demonstration test (the Osaki CoolGen Project) of oxygen-blown coal gasification combined cycle generation, which represents the next-generation coal technology development toward the even higher efficiency of and reduced carbon emissions from coal-fired thermal power generation. For the next step, we will also conduct a demonstration test on CO<sub>2</sub> separation and capture technologies. As a leading company in coal-fired thermal power generation, the J-POWER Group will take measures in the years to come to mitigate the effects of global warming through R&D and by the introduction of the latest technologies. Promoting high efficiency and the reduction of carbon emissions from coal-fired thermal

## Average Gross Thermal Efficiency (LHV) of Coal-Fired Thermal Power Plants by Country



## SOx and NOx Emissions per Unit of Thermal Power Generation



Sources: Overseas: Emissions: OECD.StatExtract.
Power generated: IEA Energy Balances of OECD Countries, 2016 edition
J-POWER Isogo figure is fiscal 2016 results.

power generation, we will respond appropriately to global warming issues.

The J-POWER Group has constantly been at the forefront in adopting cutting-edge coal-fired thermal power generation technologies over the decades. As a result, we possess not only high-efficiency power generation technologies that emit less CO<sub>2</sub>, but also environmental technologies that reduce emissions of such atmospheric pollutants as sulfur oxides (SOx) and nitrogen oxides (NOx) to levels on par with gas-fired thermal power generation.

In addition, we are working on the technology to manufacture and utilize carbon-free energy, such as hydrogen, from low-grade coal, leveraging the knowledge of coal that the J-POWER Group has built up over many years.

#### Overseas Business Development

# Q Could you please inform us about the state of progress with the projects currently under development?

A: In Thailand, Unit 2 of the U-Thai gas-fired thermal power plant came online in December 2015, and the power generation projects that we had previously been advancing, through our consolidated subsidiaries in the country, have run their course. There are currently two projects in development that have been announced to follow on from these.

The first is a coal-fired thermal power generation project in Central Java, Indonesia. In a country where electricity demand is expected to rise sharply going forward, the construction of a 2,000 MW high-efficiency, coal-fired thermal power plant, which will be fueled by Indonesia's abundant coal reserves, is progressing smoothly toward the commencement of operations in 2020. The J-POWER Group's coal-fired thermal power generation technologies, which boast thermal efficiency that is among the highest in the world and cleanness on par with gas-fired thermal power generation, have been adopted for this power plant. By

doing so, I would like to help solve Indonesia's energy problems in a way that suits the country's circumstances.

Next, in January 2017, we newly acquired a partial interest in the natural gas-fired Westmoreland Power Plant, which is under construction and scheduled to be supplied to the PJM market, which is the most-developed electricity market in the United States. This power plant is currently under construction, the intention being to start commercial operations in fiscal 2018.

Q Although it appears that your overseas power generation business will continue to expand in the years ahead, do you think it is possible that you will achieve the 10 GW target for overseas-owned capacity by fiscal 2025, as stated in the Medium-Term Management Plan?

A: Currently, we have announced the two projects that are under construction, but we are also considering multiple projects besides these. Especially in Asia, where strong demand for electricity is expected, the J-POWER Group will leverage the technological capabilities that it has accumulated so far and its abundance of overseas business experience in its search for more new development projects. Furthermore, we expect abundant business opportunities in the United States, where we have an established business platform and market liberalization is already advanced. By taking advantage of such wide-ranging overseas business opportunities and building up superior assets, we aim to achieve the goal of expanding our overseas-owned capacity to 10 GW by fiscal 2025.

## The Ohma Nuclear Power Plant Project

# Q Could you please tell us something about the situation with the Ohma Nuclear Power Plant Project?

A: From the perspective of ensuring a stable supply of energy for resource-poor Japan, nuclear power generation is an



Construction status of the Ohma Nuclear Power Plant Project (as of June 2017)

indispensable baseload power source. At the same time, nuclear power plants represent a power source that helps to address the issue of global warming, as their operation emits no  $CO_2$ .

Some plutonium remains in the spent fuel from nuclear power plant operations. In principle, to guard against nuclear non-proliferation, Japan does not hold surplus plutonium. For this reason and to use resources effectively, Japan promotes a nuclear fuel cycle in which spent fuel is reprocessed so that the plutonium and other useful materials are recovered and utilized.

The Ohma Nuclear Power Plant will be able to operate using only uranium-plutonium mixed oxide (MOX) fuel. Nuclear power plants are commonly able to use up to about one-third MOX fuel. As we are aiming to use only MOX fuel at the Ohma Nuclear Power Plant, it will play an important role in the nuclear fuel cycle.

The Ohma Nuclear Power Plant is currently under construction and undergoes reviews of its compliance with new regulatory standards by the Nuclear Regulation Authority. In addition to appropriately responding to the results of reviews, we are advancing independent efforts and steadily implementing extensive safety measures, which are a necessary condition for commencing operations.

#### Returns to Shareholders

## Q What are your thoughts with regard to future returns to shareholders?

**A:** The business environment of the J-POWER Group is in a transient period that changes dramatically toward fiscal 2020 and beyond, such as the progress of liberalization accompanying the electricity system reform.

Under these circumstances, although the J-POWER Group has reached the stage at which it is able to recover its investments in its overseas power generation business, for the time being, we are regarding it as a time to engage in the development of business projects both in Japan and overseas and to form the business assets for further growth.

Therefore, for the meantime, we will continue the stable dividends while striving to form competitive business assets and maintaining and improving financial soundness.

In addition, we will flexibly consider appropriate ways to returns to shareholders that suit the J-POWER Group business model in a liberalized market.



#### Corporate Governance

# Q The composition of the Board of Directors includes three outside directors, but is that function sufficiently performed?

A: Every year, we analyze and assess the effectiveness of the Board of Directors. In fiscal 2016, we conducted a questionnaire survey, involving all the members of the Board of Directors, on the composition, management, roles, and responsibilities of the Board of Directors, discussed the results at a Board of Directors' meeting, and judged that the effectiveness of the Board of Directors was sufficiently secured. In fiscal 2017, based on the status of initiatives implemented on the basis of the analysis and assessment results of the previous year and the results of interviews conducted mainly by the outside directors and Audit & Supervisory Board Members and chairpersons of the Board of Directors and the Audit & Supervisory Board, we will judge whether the effectiveness of the Board of Directors remains sufficiently secured as a result of discussions at a Board of Directors' meeting.

In order for the outside directors and Audit & Supervisory Board Members to fulfill their duties, we provide information on these matters at any time with the aim of deepening their understanding with regard to the J-POWER Group's Corporate Philosophy, medium-term management plans, business, financial affairs, and organization. Additionally, we provide opportunities, such as inspections of J-POWER Group facilities, for them to gain an even deeper understanding of our businesses.

Going forward, we will continue to make efforts to improve the effectiveness of the Board of Directors while enriching discussions based on changes in the business environment.

#### **Electricity System Reform**

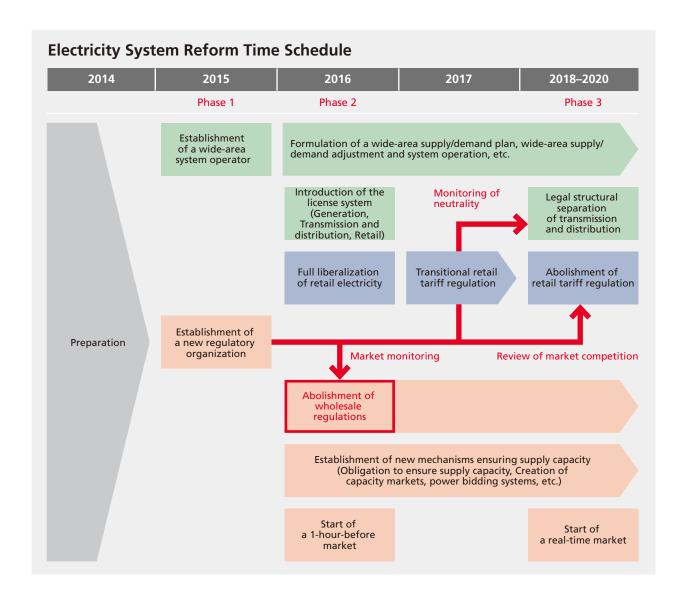
Until now, the electric power supply system has comprised the traditional, vertically integrated electric power companies (EPCOs); wholesale power companies, including J-POWER, and wholesale suppliers (IPPs) that supply electricity to EPCOs; and power producers and suppliers (PPSs). Amid a trend toward enhanced electric power industry liberalization, the revision of the Electricity Business Act created systems that enabled the creation of IPPs and PPSs and allowed companies other than electric power companies to engage in the wholesale supply of power to electric power companies as well as the retail distribution of power from 1995 onward. Since 2005, electric power transactions have been carried out at the Japan Electric Power Exchange (JEPX). Due in part to the Great East Japan Earthquake and the accident at TEPCO's Fukushima Daiichi Nuclear Power Plant, electricity generation costs have been rising, and the balance of electric power supply and demand in Japan is tightening. In response, the government is advancing electricity system reform as part of efforts to rebuild its energy policy.

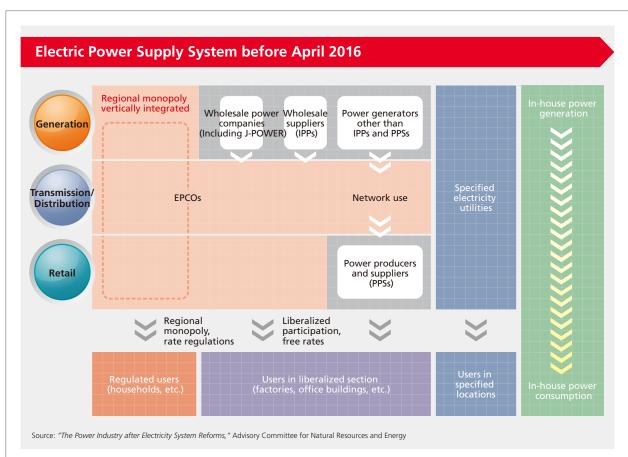
The three goals of the reform are securing the stable supply of electricity, suppressing electricity rates to the maximum extent possible, and providing consumers with choices as well as busi-

ness operators with opportunities to expand their businesses. To achieve these goals, electricity system reform will be implemented in three stages, namely expanding the operations of widearea electricity grids, fully liberalizing the retail market and power generation, and further securing the neutrality of the power transmission/distribution sector through legal unbundling.

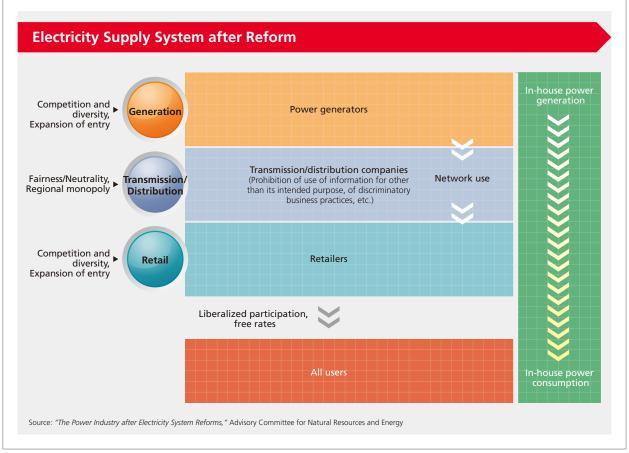
So far, based on the Policy on Electricity System Reform approved by the Cabinet in April 2013, the Electricity Business Act was amended in November 2013, and the Organization for Crossregional Coordination of Transmission Operators (OCCTO) was established in April 2015. In line with the Electricity Business Act amendment of June 2014, entry into the retail market was fully liberalized and electricity wholesale regulations\*1 abolished in April 2016. Furthermore, in June 2015, the Electricity Business Act was amended to include provisions for the legal unbundling of the transmission/distribution sector and revisions to electricity retail rate regulations (scheduled for 2020).\*2

- \*1 Rates for the supply of electricity to EPCOs in excess of set amounts or time frames were calculated on a cost basis and submitted to the Minister of Economy, Trade and Industry
- \*2 The full liberalization of retail rates for electricity will be implemented after the government has verified how much market competition has progressed.









## The J-POWER Group Medium-Term Management Plan

The J-POWER Group established a Medium-Term Management Plan in July 2015 to address the challenge of achieving further growth over the next decade by leveraging the increase in capital carried out in March 2015.

The basic direction of our efforts involves I. creating a platform for further growth in the domestic market as it undergoes liberalization and in order to survive competition in power generation by being cost-competitive; II. growing our overseas power generation business to contribute to sustainable development based on the energy circumstances in each region worldwide; and III. conducting business in Japan and abroad as a leading company

in coal-fired thermal power generation by accelerating the development of technology aimed at reducing the carbon emissions of coal-fired thermal power to adapt to measures addressing climate change.

Efforts aimed at further growth by building up the power generation business will require a growth cycle of at least 10 years considering the period required for investment in construction after planning and environmental assessment. That is why we made efforts aimed at 2025 into the J-POWER Group's "Medium-Term Management Plan."

#### Business Environment, Key Concepts of the Medium-Term Management Plan, and Six Key Initiatives

## The business environment surrounding J-POWER Group

- Intensifying market competition due to the electricity system reform
- Uncertainty surrounding nuclear power policy
- Climate change
- Robust growth in electric power demand centered upon developing countries

## J-POWER Group's strengths in finding opportunities in environmental changes

- Competitive power plants producing large volumes of electric power
- · Abundant development pipeline
- Excellent environmental technology enabling future business development
- Track record in overseas business development

#### Responses to risks to overcome

 Initiatives to further reduce carbon emissions



Key concepts of the Medium-Term Management Plan based on the above understanding of business environment and J-POWER Group's strengths

- Realize growth in Japan by "Surviving the Competition in a Liberalized Market"
- Enhancing "Overseas Business Expansion"
- Further "Low-Carbon Technologies" enabling greater business growth globally



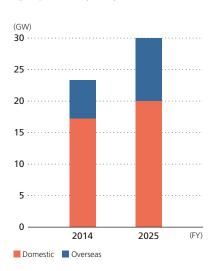
#### **6 Key Initiatives**

- (1) Promotion development of high-efficiency coal-fired thermal power plants and technology aimed at the next generation
- (2) Being competitive in the market created by liberalization and improvement of reliability of facilities
- (3) Expansion of renewable energy
- (4) Promotion of the Ohma Nuclear Power Plant Project based on the premise of safety
- (5) Promotion of overseas power generation business
- (6) Improvement of efficiency of assets by screening businesses

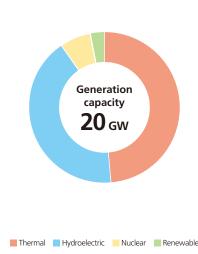
#### **Growth of Power Generation Assets**

#### Power generation capacity:

30 gw (FY2025)

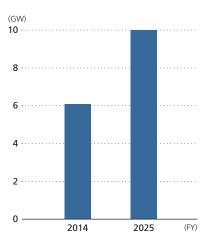


# Composition of domestic power generation assets (FY2025)



#### Overseas owned capacity:

10 gw (FY2025)



#### **Growth and Soundness Indicators: Specific Targets**

- Growth indicator: J-POWER EBITDA\*
- Increase to around 1.5 times the level of FY2014 in FY2025 (FY2014 result: ¥181.8 billion)
- Soundness indicator: Interest-bearing debt / J-POWER EBITDA\*
- Improve from the level at the end of FY2014 by the end of FY2025 (FY2014 result: 9.5 times)

#### **Returns to Shareholders**

- Although our overseas business has reached a stage in which we expect profit to grow, we remain in a period of asset formation aimed at further growth.
- At the same time, the J-POWER Group is in a transitional period in which its business environment undergoes significant change moving forward to FY2020 caused by factors such as progress of liberalization.
- Therefore, during this period, we will continue to provide stable dividends as in the past, while also working to form competitive business assets and also maintain and improve our financial soundness.
- After FY2020, we will strive to enhance the returns to shareholders as a result of our growth, and also flexibly consider how returns to shareholders should be decided, based on factors such as changes in our earnings structure.

 $<sup>\</sup>hbox{^*J-POWER EBITDA=Operating income + Depreciation and amortization + Equity in earnings of affiliates}$ 

To confirm compliance with the new safety standards, in December 2014 J-POWER submitted an application for permission for alteration of the reactor installment license and an application for construction plan approval to the Nuclear Regulation Authority summarizing the details of measures to reinforce the safety of the Ohma Nuclear Power Plant.

We will implement all measures during construction to ensure that we build a safe power plant.

#### **Measures to Reinforce Safety**

#### 1. Measures to Design Basis Accidents

#### **Earthquake Proofing**

We adopted a new standard seismic motion based on the latest findings and other factors. The adopted standard seismic motion is a maximum acceleration of 650 cm/s² (previously 450 cm/s²). Earthquake-proof designs for buildings and other structures were adopted based on this standard seismic motion.

#### **Tsunami Countermeasures**

We also adopted the following design basis tsunami based on the latest findings. We estimated that the maximum height of a tsunami at the site based on the following design basis tsunami is T.P. +6.3 m (previously +4.4 m), but the elevation of the power station site is T.P. +12 m, and consequently, there is no likelihood of a tsunami reaching and following into the site.

From the perspective of enhancing confidence even further, we will implement independent measures including construction of seawalls and installation of waterproof exterior doors and so on.

#### **Measures to Prevent Damage from External Impact**

(1) We assessed the impact of natural phenomena (volcanic eruptions, tornados, external fires, etc.) on the nuclear power station.

#### **Fire Protection**

(2) We will enhance fire protection measures including use of fire resistant cables and construction of firewalls.

#### **Internal Flooding Resistance Measures**

(3) We will reinforce resistance measures against leaks to protect facility functions in anticipation of damage to pipes within the facility.

#### 2. Against Severe Accidents and Terrorism

To prevent damage to the nuclear reactor and containment vessel, we will implement the following measures.

#### Measures to Prevent Core Damage and Containment Vessel Failure

(4) Even in the case where nuclear reactor emergency shutdown equipment does not operate, an alternative control rod insertion mechanism that can be operated by separate circuits or manually will be installed to enable shutdown of the nuclear reactor.

#### Image of Measures to Reinforce Safety at Ohma Nuclear Power Plant

Design basis Against severe accidents and terrorism (12) Storage batteries (10) Static catalytic hydrogen re-coupling devices (2) Enhanced fire protection Reactor building Emergency diesel generator (7) Alternative automatic depressurization system Storage batteries Spent fuel storage poo Turbine generator ontainment Transformer Seawall height (T.P. +15 m) Nuclear reactor 8888 Ground level of compound (T.P. +12 m) Seawater Highest seawater level Firewall oump of tsunami (T.P. +6.3 m) retardant Power panel Filtered cable (<del>-</del>-D T.P.: The average sea level in Tokyo Bay (9) Filtered containment venting system Seawall Waterproofing modification of doors in exterior walls\* (3) Reinforcement of internal (4) Alternative control rod insertion mechanism flooding resistance measures \* Independent measures

- (5) Permanent alternative water injection facilities will be installed to cool the nuclear reactor, containment vessel, and spent fuel storage pool.
- (6) Mobile alternative water injection pumps will be available to cool the nuclear reactor, containment vessel, and spent fuel storage pool.
- (7) An alternative automatic depressurization system will be installed to reduce pressure in the nuclear reactor.
- (8) Heat exchanger units will be installed to release generated heat.
- (9) A filtered containment venting system\*¹ will be installed to prevent damage from excess pressure in the containment vessel.
- (10) Static catalytic hydrogen re-coupling devices\*2 will be installed to prevent damage from hydrogen explosions in the reactor building.
- (11) Water spraying facilities will be installed to control the dispersion of radioactive material outside the power station.

#### **Reinforcement of Power and Water Supplies**

- (12) To ensure power supplies, air-cooled emergency generators and gas turbine generators will be installed, the capacity of existing storage batteries will be increased, additional batteries will be installed, and a power supply vehicle will be made available.
- (13) Water storage tanks will be installed to secure a water source necessary for resolution of severe accidents.

#### **Ensuring Support Functions of the Control Room**

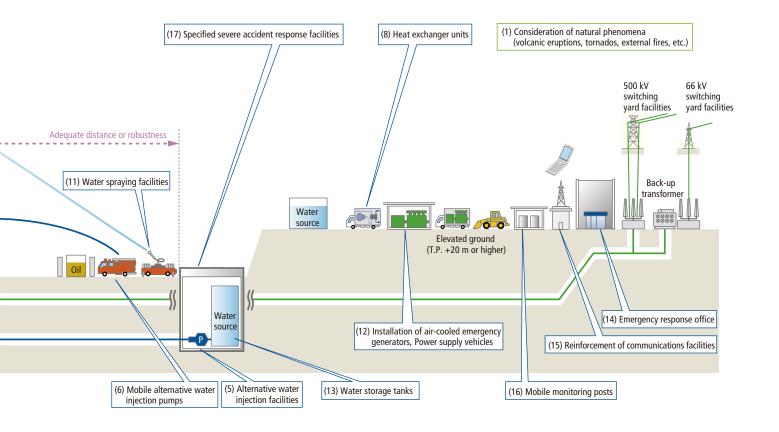
- (14) An emergency response office will be created to respond to severe accidents.
- (15) Communications facilities will be reinforced to ensure communications with necessary locations inside and outside the power station.
- (16) Mobile monitoring posts will be established to monitor, measure and record the concentration and radio-activity of radioactive material in the vicinity of the power station.

#### **Countermeasures against Intentional Aircraft Crashes**

- (17) Specified severe accident response facilities will be established to control the abnormal external release of radioactive material in the event of the intentional crash of a large aircraft into the reactor buildings or other terrorist attacks.
- \*1. Filtered containment venting system:

  A system that controls the release of radioactive material and releases steam from the containment vessel into the atmosphere in order to prevent damage to the containment vessel in the event of an excessive increase in pressure inside the nuclear reactor containment vessel.
- \*2. Static catalytic hydrogen re-coupling devices:

  A system that uses a catalyst to cause a chemical reaction between hydrogen molecules and oxygen molecules to generate water vapor in order to prevent an increase in hydrogen concentration that could result in a hydrogen explosion in the event that damage to the reactor core occurs, causing hydrogen to leak inside the reactor building and the concentration of hydrogen to increase.





## **Electric Power Business**

## **Domestic Electric Power Business (Hydroelectric Power)**

#### **Overview of Operations and Salient Features**

J-POWER boasts a track record in the building and operation of hydroelectric power plants that extends back more than half a century. Including the Sakuma Power Plant, which began operations in 1956 in a bid to solve postwar power shortages, J-POWER has developed many large-scale conventional hydroelectric power plants. Subsequently, from the 1970s onward, the Company developed large-scale pumped storage hydroelectric power plants, such as that at Shintoyone.

The salient features of hydroelectric power plants are that they are capable of changing output extremely quickly to respond to demand fluctuations and can cover peak demand in daily and seasonal supply-demand balancing in Japan's grid. Furthermore, for resource-poor Japan, hydroelectric power represents a valuable, purely domestic energy resource and, as a CO<sub>2</sub>-free power source, plays a central role in renewable energy.

In addition to continuing the efficient maintenance and management of existing hydroelectric power generation facilities,

J-POWER is carrying out comprehensive renewals of its main power generating machinery to increase capacity and the power generated through optimal designs utilizing the latest technologies. J-POWER is also undertaking the development of small- to medium-scale hydroelectric power plants that utilize untapped hydroelectric resources in order to effectively utilize this precious resource to the maximum extent possible.



Sakuma Power Plant (Shizuoka Prefecture)

#### **Major Hydroelectric Power Plants**

(As of April 1, 2017)

Power Plants	Beginning of Operation	Location	Capacity (kW)	Туре
Shimogo	1988	Fukushima Prefecture	1,000,000	Dam conduit type, pumped storage
Okutadami	1960	Fukushima Prefecture	560,000	Dam conduit type
Otori	1963	Fukushima Prefecture	182,000	Dam type
Tagokura	1959	Fukushima Prefecture	400,000	Dam type
Okukiyotsu	1978	Niigata Prefecture	1,000,000	Dam conduit type, pumped storage
Okukiyotsu No. 2	1996	Niigata Prefecture	600,000	Dam conduit type, pumped storage
Numappara	1973	Tochigi Prefecture	675,000	Dam conduit type, pumped storage
Shintoyone	1972	Aichi Prefecture	1,125,000	Dam conduit type, pumped storage
Sakuma	1956	Shizuoka Prefecture	350,000	Dam conduit type
Miboro	1961	Gifu Prefecture	215,000	Dam conduit type
Nagano	1968	Fukui Prefecture	220,000	Dam type, pumped storage
Tedorigawa No. 1	1979	Ishikawa Prefecture	250,000	Dam conduit type
Ikehara	1964	Nara Prefecture	350,000	Dam type, pumped storage
Sendaigawa No. 1	1965	Kagoshima Prefecture	120,000	Dam type

Note: Lists power plants with maximum output of 100,000 kW or more

#### **Major Hydroelectric Power Plant Projects**

Project Name	Year Beginning Operation (Planned)	Location	Capacity (kW)
Shinkatsurazawa/Kumaoi	2022	Hokkaido Prefecture	21,900
Akiba No. 1 (increased capacity by comprehensive renewal)	2018	Shizuoka Prefecture	45,300→47,200

### **Domestic Electric Power Business (Wind Power)**

#### **Overview of Operations and Salient Features**

J-POWER is a pioneer in the wind power generation business, having commenced operations at its first wind farm in 2000. Since then, the Company has steadily expanded this business and, as of April 1, 2017, owns 22 wind farms (247 units) around the country, with a total output capacity of 444 MW (owned capacity: 439 MW), making it the second-largest wind power producer in the country. Drawing on its many years of experience, expertise, and technologies in the building, operation, and maintenance of power plants and transmission lines, the J-POWER Group has created a system that covers the full gamut of the wind power business, from surveys of wind conditions to wind farm design, construction, and operation and maintenance (O&M).

Leveraging its diverse experience, J-POWER is making its O&M systems more efficient while working to improve utilization rates and enhance profitability. The feed-in tariff system took effect in 2012, and J-POWER has acquired facility accreditation under the system for both new and existing wind power facilities.

#### New Site Development and Offshore Wind Power Initiatives

J-POWER is working toward the development of new capacity. The aim is for the Setana-Ohsato Wind Farm, Kuzumaki No. 2

Wind Farm, and Nikaho No. 2 Wind Farm to commence operation in fiscal 2019, and these are all currently under construction. J-POWER will continuously seek locations that possess wind conditions suitable for new facilities and steadily develop new projects in the years to come.

With regard to offshore wind power, a consortium that includes the Company has been selected as preferred bidder following a public tender for the installer and operator of the Hibikinada Offshore Wind Farm off the coast of Kita-Kyushu in Fukuoka Prefecture. In the years to come, we will be conducting surveys on the wind conditions and marine areas toward the commercialization of offshore wind power generation in Hibikinada.



Yurihonjo Bayside Wind Farm (Akita Prefecture)

#### **Wind Power Projects**

(As of April 1, 2017)

Wind Farms/Plants	Operating Companies	Location	(Number of Wind Turbines)	Capacity (kW)	Ownership	Beginning of Operation*1
Sarakitomanai Wind Farm	J-Wind Co., Ltd.	Hokkaido Prefecture	(9)	14,850	100%	2001 (2009)
Tomamae Winvilla Wind Farm	J-Wind Co., Ltd.	Hokkaido Prefecture	(19)	30,600	100%	2000
Shimamaki Wind Farm	J-Wind Co., Ltd.	Hokkaido Prefecture	(6)	4,500	100%	2000 (2009)
Setana Seaside Wind Farm	J-Wind Co., Ltd.	Hokkaido Prefecture	(6)	12,000	100%	2005
Kaminokuni Wind Farm	J-Wind Co., Ltd.	Hokkaido Prefecture	(12)	28,000	100%	2014
Ohma Wind Farm	J-Wind Co., Ltd.	Aomori Prefecture	(9)	19,500	100%	2016
Green Power Kuzumaki Wind Farm	J-Wind Co., Ltd.	Iwate Prefecture	(12)	21,000	100%	2003
Yurihonjo Bayside Wind Farm	Yurihonjo Wind Power Co., Ltd.	Akita Prefecture	(7)	16,100	100%	2017
Nikaho Kogen Wind Farm	J-Wind Co., Ltd.	Akita Prefecture	(15)	24,750	100%	2001
Koriyama-Nunobiki Kogen Wind Farm	J-Wind Co., Ltd.	Fukushima Prefecture	(33)	65,980	100%	2007
Hiyama Kogen Wind Farm	J-Wind Co., Ltd.	Fukushima Prefecture	(14)	28,000	100%	2011
Tokyo Bayside Wind Power	J-Wind Co., Ltd.	Tokyo metropolitan area	(2)	1,700	100%	2003
Irouzaki Wind Farm	J-Wind Co., Ltd.	Shizuoka Prefecture	(17)	34,000	100%	2010
Tahara Bayside Wind Farm	J-Wind Co., Ltd.	Aichi Prefecture	(11)	22,000	100%	2005
Tahara Wind Farm	J-Wind Co., Ltd.	Aichi Prefecture	(1)	1,980	100%	2004
Awara-Kitagata Wind Farm	J-Wind Co., Ltd.	Fukui Prefecture	(10)	20,000	100%	2011
Yokihi no Sato Wind Park	J-Wind Co., Ltd.	Yamaguchi Prefecture	(3)	4,500	100%	2003 (2009)
Minami Ehime Wind Farm	J-Wind Co., Ltd.	Ehime Prefecture	(12)	28,500	100%	2015
Nagasaki-Shikamachi Wind Farm	Nagasaki-Shikamachi Wind Power Co., Ltd.	Nagasaki Prefecture	(15)	15,000	70%	2005
Aso-Nishihara Wind Farm	J-Wind Co., Ltd.	Kumamoto Prefecture	(10)	17,500	100%	2005
Aso-Oguni Wind Farm	J-Wind Co., Ltd.	Kumamoto Prefecture	(5)	8,500	100%	2007 (2009)
Minami Oosumi Wind Farm	Minami Kyushu Wind Power Co., Ltd.	Kagoshima Prefecture	(19)	24,700	99%	2003 (Nejime) (2009) 2004 (Sata) (2009)
Domestic Total			(247)	443,660		
Zajaczkowo Wind Farm	Zajaczkowo Windfarm Sp. zo. o.	Poland	(24)	48,000	50%	2008
Total including overseas			(271)	491,660		

<sup>\*1</sup> The year when J-POWER purchased its current holdings of shares from other companies.



### **Domestic Electric Power Business (Thermal Power)**

#### **Overview of Operations and Salient Features**

J-POWER's thermal power operations center on coal-fired thermal power generation. J-POWER's first coal-fired thermal power plant commenced operations in 1963, in line with Japan's policy at the time of using domestically produced coal. Following the oil shocks of the 1970s, the Company responded to government plans to diversify the mix of power sources, which had been centered on oil-fired thermal power generation. In 1981, J-POWER began operations at the Matsushima Thermal Power Plant, the first in Japan fueled with imported coal. J-POWER went on to develop a series of large-scale coal-fired thermal power plants—such as those at Matsuura and Tachibanawan—that run on imported coal, increasing the scale of its business. The Company has continued to work to improve power generation efficiency by enhancing steam conditions and scaling up plants in its

efforts to improve competitiveness and decrease environmental impact. Providing an economical and stable baseload source of electricity, J-POWER's coal-fired thermal power plants maintain high load factors.



Tachibanawan Thermal Power Plant

#### **Coal-Fired Thermal Power Plants**

(As of April 1, 2017)

Power Plants		Beginning of Operation	Location	Capacity (kW)
Isogo	New No. 1 New No. 2	2002 2009	Kanagawa Prefecture	600,000 562,000*²
Takasago	No. 1 No. 2	1968 1969	Hyogo Prefecture	250,000 250,000
Takehara	No. 1 No. 2 No. 3	1967 1974*¹ 1983	Hiroshima Prefecture	250,000 350,000 700,000
Tachibanawan	No. 1 No. 2	2000 2000	Tokushima Prefecture	1,050,000 1,050,000
Matsushima	No. 1 No. 2	1981 1981	Nagasaki Prefecture	500,000 500,000
Matsuura	No. 1 No. 2	1990 1997	Nagasaki Prefecture	1,000,000 1,000,000
Ishikawa Coal	No. 1 No. 2	1986 1987	Okinawa Prefecture	156,000 156,000
Total				8,374,000

<sup>\*1</sup> Converted from heavy oil-fueled boiler to coal-fueled fluidized boiler in 1995

#### **Other J-POWER Thermal Power Plants**

(As of April 1, 2017)

Plant Name	Operating Companies	Location	Capacity (kW)	Fuel Type	Ownership	Beginning of Operation
Bayside Energy Ichihara	Bay Side Energy Co., Ltd.	Chiba Prefecture	107,650	Gas*1	100%	2005
Mihama Seaside Power Shinminato	Mihama Seaside Power Co., Ltd.	Chiba Prefecture	104,770	Gas* <sup>1</sup>	100%	2005
Itoigawa	ITOIGAWA POWER Inc.	Niigata Prefecture	149,000	Coal	64% TAIHEIYO CEMENT CORPORATION*²	2001 (2003)*³
Tosa	TOSA POWER Inc.*4	Kochi Prefecture	167,000	Coal	45% Shikoku Electric Power Co., Inc.* <sup>2</sup> TAIHEIYO CEMENT CORPORATION* <sup>2</sup>	2005
Genex Mizue	GENEX Co., Ltd.*4	Kanagawa Prefecture	238,000	Gas Oil Residue	40% TOA Oil Co., Ltd.*²	2003
Subtotal			766,420			

<sup>\*1</sup> Generation method: combined cycle

<sup>\*2</sup> Due to an equipment failure, the operating output of Isogo New No. 2 was reduced from 600 MW to 562 MW, but was restored to 600 MW in June 2017.

<sup>\*2</sup> Partners

<sup>\*3</sup> Date of investment participation by J-POWER

<sup>\*4</sup> Equity-method affiliates

#### **Replacement and New Capacity Projects**

J-POWER is promoting new coal-fired thermal power projects to replace aging thermal power plants and develop new power plants to contribute to the stable supply of electricity in Japan over the medium-to-long term. Because these projects will commence operations after the abolition of wholesale regulations that has been implemented as part of Japan's electricity system reform, unlike the coal-fired thermal power plants J-POWER has developed in the past, the terms of their business contracts, such as who they sell to and at what rate, will not be restricted by said regulations.

In addition to taking these coal-fired thermal power initiatives, J-POWER is promoting the construction of a new geothermal power plant in the city of Yuzawa, Akita Prefecture. Construction of the Wasabisawa Geothermal Power Plant (capacity 42 MW) by a joint venture with Mitsubishi Materials Corporation and Mitsubishi Gas Chemical Company, Inc., is under way, and the start of operations is planned for May 2019. Furthermore, the Onikobe Geothermal Power Station, which had been in continuous operation for more than 40 years, was shut down on April 1, 2017, and an environmental assessment is currently being implemented for its intended 15 MW-class capacity replacement.



Takehara Thermal Power Plant Unit New No. 1 (post-completion rendering)

#### New Coal-Fired Power Projects in Japan

#### Takehara Thermal Power Plant Unit New No. 1 (Replacement)

Location	Takehara City, Hiroshima Prefecture
Status	Under construction for replacement
Start of operations	Scheduled for June 2020
Capacity	600 MW $\rightarrow$ 600 MW (Replacement at the same capacity)
Steam conditions	$Sub\text{-critical} \to Ultra\text{-supercritical}$

#### Takasago Thermal Power Plant Unit New No. 1/No. 2 (Replacement)

Location	Takasago City, Hyogo Prefecture
Status	Undergoing environmental assessment
Start of operations	Scheduled for 2021 (New No. 1) and 2027 or later (New No. 2)
Capacity	500 MW → 1,200 MW (Replacement for larger capacity)
Steam conditions	Sub-critical → Ultra-supercritical

#### Kashima Power (New Capacity)

✓ Status: Under construction (construction started November 2016)

✓ Start of operation scheduled for July 2020

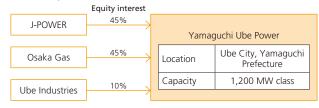


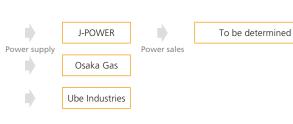
\* Nippon Steel & Sumitomo Metal Corporation

#### Yamaguchi Ube Power (New Capacity)

✓ Status: Implementing environmental assessment

✓ Start of operation scheduled for 2023 (No. 1), 2025 (No. 2)





TEPCO Energy Partner, Inc. and others J-POWER Power supply Power sales NSSMC



### **Domestic Electric Power Business (Transmission/Transformation)**

#### **Overview of Operations and Salient Features**

As a wholesale supplier of electric power supplying electricity nationwide, J-POWER owns and operates approximately 2,400 km of transmission lines and nine substations and converter stations throughout Japan. In addition to transmitting electric power generated by its own power plants to demand areas, J-POWER supports parts of the grids of electric power companies by connecting the grid of each company, fulfilling a major role in the nationwide operation of Japan's overall power grid.

In particular, we operate critical facilities that support wide area power interchange in Japan, such as interconnecting lines (Kitahon HVDC Link, Honshi Interconnecting Line, Anan-Kihoku HVDC Link, and Kanmon Interconnecting Line) connecting Honshu with Hokkaido, Shikoku, and Kyushu as well as the Sakuma Frequency Converter Station, which connects the different frequencies of eastern Japan (50 Hz) and western Japan (60 Hz). J-POWER's transmission/transformation facilities contributed to alleviating the tight regional electricity supply-demand balances that followed the Great East Japan Earthquake. The Company will maintain facilities reliability and focus efforts on ensuring stable operations.

J-POWER also maintains a communications network throughout Japan that is used for facility protection, monitoring, and control as well as operational management to contribute to the operation of the power plants and the power grid.

Furthermore, in June 2016, the Organization for Cross-regional Coordination of Transmission Operators published its Cross-Regional Network Development Plan, which includes plans for increasing the capacity of the Sakuma Frequency Converter Station. J-POWER has been chosen to implement this plan. Accordingly, in line with government policy requirements and the purpose of the plan—to ensure the stable supply of electric power—the Company is advancing detailed examinations in preparation for construction.



Sakuma Frequency Converter Station

#### **Major Transmission Lines**

(As of April 1, 2017)

Major Transmission Lines	Beginning of Operation	Location	Distance	Voltage
Tokachi Trunk Line	1956	Hokkaido Prefecture	214.4 km	187 kV
Kitahon HVDC Link	1979	Hokkaido Prefecture – Aomori Prefecture	167.4 km	DC±250 kV
Tadami Trunk Line	1959	Fukushima Prefecture – Tokyo metropolitan area	216.2 km	275kV-500 kV
Sakuma East Trunk Line	1956	Shizuoka Prefecture – Tokyo metropolitan area	197.2 km	275 kV
Sakuma West Trunk Line	1956	Shizuoka Prefecture – Aichi Prefecture	107.7 km	275 kV
Miboro Trunk Line	1960	Gifu Prefecture – Aichi Prefecture	108.6 km	275 kV
Honshi Interconnecting Line	1994	Kagawa Prefecture – Okayama Prefecture	127.0 km	500 kV
Anan-Kihoku HVDC Link	2000	Tokushima Prefecture – Wakayama Prefecture	99.8 km	DC±250 kV
Nahari Trunk Line	1960	Kochi Prefecture – Ehime Prefecture	120.0 km	187 kV
Kanmon Interconnecting Line	1980	Fukuoka Prefecture – Yamaguchi Prefecture	64.2 km	500 kV

#### Substations

(As of April 1, 2017)

Substations	Beginning of Operation	Location	Output
Isawa	2012	Iwate Prefecture	9,000 kVA
Minami Kawagoe	1959	Saitama Prefecture	1,542,000 kVA
Nishi Tokyo	1956	Tokyo metropolitan area	1,350,000 kVA
Nagoya	1956	Aichi Prefecture	1,400,000 kVA

#### **Frequency Converter Station**

(As of April 1, 2017)

Frequency Converter Station	Beginning of Operation	Location	Output
Sakuma	1965	Shizuoka Prefecture	300,000 kW

#### **AC/DC Converter Stations**

(As of April 1, 2017)

AC/DC Converter Stations	Beginning of Operation	Location	Output
Hakodate	1979	Hokkaido Prefecture	600,000 kW
Kamikita	1979	Aomori Prefecture	600,000 kW
Kihoku	2000	Wakayama Prefecture	1,400,000 kW
Anan	2000	Tokushima Prefecture	1,400,000 kW

## **Electric Power-Related Business**

#### **Overview of Operations and Salient Features**

J-POWER operates electric power-related businesses that support the smooth and efficient implementation of its electric power business. Specifically, these businesses are required for the operation of power generation, transmission, and transformation facilities and include businesses undertaking the design, construction, inspection, and maintenance of those facilities; importing coal; and transporting coal using the Company's vessels. J-POWER conducts the maintenance of the power-generation facilities of its domestic wholesale electric power business in close partnership with its subsidiaries.

#### **Coal Procurement**

J-POWER procures fuel coal primarily from Australia and Indonesia. In Australia, the Company owns interests in three coal-mining projects through subsidiaries.

The global supply and demand of coal can vary greatly due to demand from developing countries, including China and India, trends related to energy resources other than coal, such as liquefied natural gas (LNG), and other geopolitical factors. In view of this situation, J-POWER has an upstream presence with respect

to the ownership of coal mines and securing diversified procurement sources to stably procure coal as fuel for thermal power generation over the long term.



#### **Coal Mining Projects**

(As of April 1, 2017)

Mine Name	Location	Loading Port	Production Volume 2016*1	Investment Ratio* <sup>2</sup>	Beginning of Commercial Production
Clermont	Queensland	Dalrymple Bay	12.66 million t	15%	2010
Narrabri	New South Wales	Newcastle	7.79 million t	7.5%	2010
Maules Creek	New South Wales	Newcastle	8.03 million t (Approx. 10.7 million t/yr)	10%	2014

<sup>\*1</sup> The production volume in parentheses represents figures for anticipated peak production.

<sup>\*2</sup> Investment through a subsidiary, J-POWER AUSTRALIA PTY. LTD.



## Overseas Business

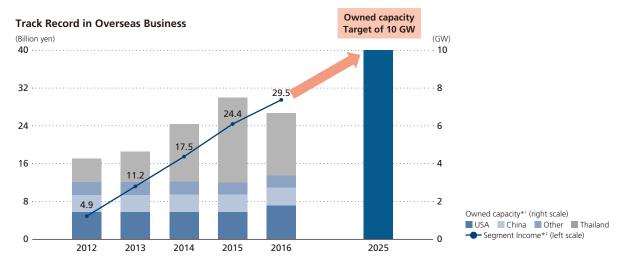
#### **Overview of Operations and Salient Features**

J-POWER has been involved in the overseas consulting business since 1960. Over the many years since, it has undertaken consulting business around the world, including for environmental impact assessments, the adoption of desulfurization, denitrification, and other environmental technologies in coal-fired thermal power generation, and the planning, design, and construction supervision of thermal and hydroelectric power and transmission and transformation projects.

Amid ongoing deregulation of electric power industries around the world, J-POWER established a dedicated in-house organization in 1997 and commenced activities that would lead to the development of overseas power generation business that participates in projects by investing capital and technologies in overseas markets where ongoing strong demand is expected.

At first, the focus was on participation based on a model of partial involvement in the building and operation of power plants through comparatively small-scale capital investment. Amid intense competition, the Company steadily built up its experience and track record and expanded its business participation to major capital investment and greenfield projects. In Thailand, J-POWER started business participation in 2000, and operations at the large-scale gas combined cycle Kaeng Khoi 2 Power Plant commenced in 2007. Furthermore, beginning in 2013, gas-fired thermal power plants came on stream as SPP and IPP projects through Thai consolidated subsidiaries of which J-POWER is the major investor.

In addition, having launched a local subsidiary and started full-scale business development in the United States in 2005, J-POWER commenced its first commercial operations of a U.S. greenfield project, the Orange Grove Power Plant, in 2010.



- \*1 Owned capacity is calculated by multiplying the capacity of the facility by J-POWER's investment ratio.
- \*2 To indicate the actual status of Segment Income, it excludes foreign exchange gains or losses from reportable segment "Overseas business" (overseas power generation business, etc.).

#### Project Development and New Development Projects at Consolidated Subsidiaries in Thailand

Through its Thai consolidated subsidiaries, J-POWER has significantly expanded the scale of its overseas power generation assets by having completed several large-scale gas-fired thermal projects. These projects included seven 100 MW class gas-fired thermal power projects (7 SPPs project), which are in line with the Thai government's SPP program, and two large-scale, gas-fired IPP projects (1,600 MW each).

Currently, J-POWER is working on Indonesia's Central Java Project (output 2,000 MW), and construction is proceeding smoothly for a start of operations in 2020. In the United States, in addition to acquiring additional interest in the Elwood Energy Project (output 1,350 MW) in November 2016 (owned capacity 25%→50%), the Company acquired a new interest in the Tenaska Westmoreland thermal power plant project that is under construction. Going forward, we will be aggressively promoting our overseas power generation business with the aim of realizing overseas owned capacity of 10 GW in 2025, which is the target for 2025 under the Medium-Term Management Plan.

#### Overviews of Project Development at Consolidated Subsidiaries in Thailand

3						
Project Name	e Ove	erview				
7 SPPs*1		Seven 100 MW class cogen	eration gas-fired the	ermal power	plants based o	on the Thai governme
Capacity:		SPP program*1	J	3	3	
, ,	(110 MW × 5) •	The projects will sell electric	ity to the Electricity	Generating A	Authority of Th	nailand (EGAT) and ne
	(120 MW × 2)	customers for 25 years (they	y will also supply ste	am and cold	water to near	by customers).
Гуре:	CCGT*3	After a transfer of equity of	Gulf JP Co., Ltd. to	the local par	tner in Augus	t 2016, J-POWER hol
Start of operati	ion: 2013	60% stake in six plants and	a 45% stake*2 in or	ne plant.		
		71 >	~			
Nong Saeng	IPP •	Sale of electricity to EGAT for	or 25 years from the	commencer	ment of opera	tions.
Capacity:	Total 1,600 MW		Scheme Diagram			
	(800 MW x 2 units)					
Type:	CCGT*3	J-POWER		Local Partner		
Start of operati	ion: 2014	Ä		3		Ownership ratio after
		60%	Gulf JP Co., Ltd.	40%		a transfer of equity to
U-Thai IPP		00 /8		40 /0		the local partner in
	T . 14 600 NOV		<b>↓</b> 100%			August 2016
Capacity:	Total 1,600 MW	3 /	Operating Companies			
-	(800 MW x 2 units)		7 5			
Type:	CCGT*3	Gas Supply Agreement L		PPAs		
Start of operati	ion: 2015	PTT		EGAT	<b>→</b>	
			_			

#### **Current Status of New Projects**

#### Central Java (Indonesia)

Capacity: 2,000 MW

(1,000 MW x 2)

Type: Coal (USC) Ownership: 34%

Status: Under construction

Start of operation No. 1: Jun. 2020

No. 2: Dec. 2020

## Jakarta Batang, Central Java Province Java, Indonesia

#### Westmoreland (USA)

Capacity: 926 MW Type: CCGT\*3

Ownership: 25%

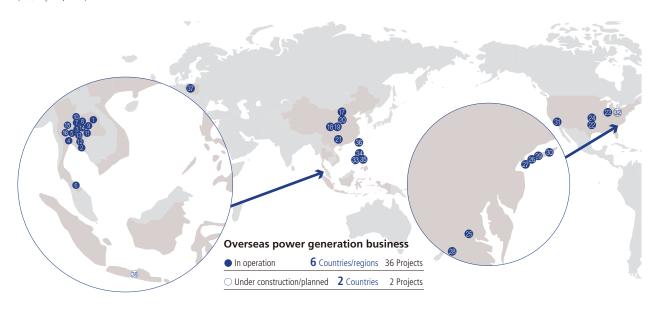
Status: Under construction Start of operation: 2018



<sup>\*1</sup> SPP (Small Power Producers) program: The long-term power purchase scheme established by the Thai government. This scheme promotes cogeneration systems, renewable energy, and similar methods, and aims at reducing the import and use of fuel oil. EGAT guarantees the purchase of electricity generated from eligible suppliers up to 90 MW of capacity.
\*2 As for the NLL project of the 7 SPPs project, a part of its stake was sold to an operating company of its industrial park on January 2013.
\*3 CCGT: Combined Cycle Gas Turbine

#### **Overseas Power Generation Projects**

(As of April 1, 2017)



Current Status	Projec	t Name	Generation Type	Capacity (MW)	Ownership	Power Purchaser	Validity of PPA
	Thail	and					
	0	Roi-Et	Biomass (Chaff)	10	24.7%	Electricity Generating Authority of Thailand	Valid to 2024
	2	Rayong	Gas (Combined Cycle)*1	112	20%	Electricity Generating Authority of Thailand/ Companies in the industrial park	Valid to 2024
	3	Gulf Cogeneration (Kaeng Khoi)	Gas (Combined Cycle)*1	110	49%	Electricity Generating Authority of Thailand/ Companies in the industrial park	Valid to 2019
	4	Samutprakarn	Gas (Combined Cycle)*1	117	49%	Electricity Generating Authority of Thailand/ Companies in the industrial park	Valid to 2020
	6	Nong Khae	Gas (Combined Cycle)*1	120	49%	Electricity Generating Authority of Thailand/ Companies in the industrial park	Valid to 2021
	6	Yala	Biomass (Rubber Wood Waste)	20	49%	Electricity Generating Authority of Thailand	Valid to 2031
	•	Kaeng Khoi 2	Gas (Combined Cycle)*1	1,468	49%	Electricity Generating Authority of Thailand	Valid to 2033
In	8	KP1* <sup>2</sup>	Gas (Combined Cycle)*1	110	60%	Electricity Generating Authority of Thailand/ Companies in the industrial park	Valid to 2038
operation	9	KP2*2	Gas (Combined Cycle)*1	110	60%	Electricity Generating Authority of Thailand/ Companies in the industrial park	Valid to 2038
	0	TLC*2	Gas (Combined Cycle)*1	110	60%	Electricity Generating Authority of Thailand/ Companies in the industrial park	Valid to 2038
	0	NNK*²	Gas (Combined Cycle)*1	110	60%	Electricity Generating Authority of Thailand/ Companies in the industrial park	Valid to 2038
	12	NLL*2	Gas (Combined Cycle)*1	120	45%	Electricity Generating Authority of Thailand/ Companies in the industrial park	Valid to 2038
	13	CRN*2	Gas (Combined Cycle)*1	110	60%	Electricity Generating Authority of Thailand/ Companies in the industrial park	Valid to 2038
	4	NK2*2	Gas (Combined Cycle)*1	120	60%	Electricity Generating Authority of Thailand/ Companies in the industrial park	Valid to 2038
	<b>1</b>	Nong Saeng	Gas (Combined Cycle)*1	1,600	60%	Electricity Generating Authority of Thailand	Valid to 2039
	16	U-Thai	Gas (Combined Cycle)*1	1,600	60%	Electricity Generating Authority of Thailand	Valid to 2040
		Subtotal 16	projects	5,947 (0	Owned capa	city: 3,300 MW)	

<sup>\*1</sup> Combined cycle generating system which uses a gas turbine and a steam turbine driven by the exhaust gas from the gas turbine. \*2 7 SPPs project commenced operation in 2013.







Green Country (USA)

Current Status	Project	: Name	Generation Type	Capacity (MW)	Ownership	Power Purchaser	Validity of PPA
	China						
	•	Tianshi	Low-Grade Coal Coal Waste	50	24%	Shanxi Province Power Corporation	Renewed every year* <sup>4</sup>
In operation	<b>®</b> - <b>®</b>	Hanjiang (Xihe/ Shuhe)	Hydroelectric	450	27%	Shaanxi Electric Power Company	Renewed every year* <sup>4</sup>
operation	20	Gemeng*3	Mainly Coal	6,392	7%	Shanxi Province Power Corporation	_
	<b>a</b>	Hezhou	Coal	2,090	17%	Guangxi Power Grid Co.	Renewed every year*4
		Subtotal 5 pr	ojects	8,958 (0	Owned capa	city: 936 MW)	
	USA						
	22	Tenaska Frontier	Gas (Combined Cycle)*1	830	31%	Exelon Generation Company, LLC	Valid to 2020
	23	Elwood Energy	Gas (Simple Cycle)	1,350	50%	Constellation/PJM market	Partially valid to 2017
	24	Green Country	Gas (Combined Cycle)*1	795	50%	Exelon Generation Company, LLC	Valid to 2022
	25	Birchwood	Coal	242	50%	Virginia Electric and Power Company	Valid to 2021
n	26	Pinelawn	Gas (Combined Cycle)*1	80	50%	Long Island Power Authority	Valid to 2025
operation	27	Equus	Gas (Simple Cycle)	48	50%	Long Island Power Authority	Valid to 2017
	28	Fluvanna	Gas (Combined Cycle)*1	885	15%	Shell Energy North America	Valid to 2024
	29	Edgewood	Gas (Simple Cycle)	88	50%	Long Island Power Authority	Valid to 2018
	<b>3</b>	Shoreham	Jet Fuel (Simple Cycle)	90	50%	Long Island Power Authority	Valid to 2017
	<b>⑤</b>	Orange Grove	Gas (Simple Cycle)	96	50%	San Diego Gas & Electric	Valid to 2035
		Subtotal 10 p	rojects	4,504 (0	Owned capa	city: 1,785 MW)	
Under construction	32	Westmoreland	Gas (Combined Cycle)*1	926	25%	PJM market	
	Other	Countries/Regio	n				
	<b>®</b> − <b>®</b>	CBK (Philippines) (3 projects)	Hydroelectric	728	50%	National Power Corporation	Valid to 2026
In operation	36	Chiahui (Taiwan)	Gas (Combined Cycle)*1	670	40%	Taiwan Power Company	Valid to 2028
	37	Zajaczkowo (Poland)	Wind Power	48	50%	ENERGA OBROT S.A.	Valid to 2023
		Subtotal 5 pr	ojects	1,446 (0	Owned capa	city: 656 MW)	
Under construction	38	Central Java (Indonesia)	Coal	2,000	34%	PT PLN	25 years

<sup>\*3</sup> Gemeng International Energy Co., Ltd., is an electric power company that owns 14 power generation companies.
\*4 Although power purchase agreements are renewed every year, J-POWER makes other agreements with power purchasers for continuous power purchase during operations.



## Other Business

#### **Overview of Operations and Salient Features**

Aiming to fully utilize the management resources and know-how at its disposal, J-POWER operates multifaceted businesses. These include telecommunications businesses through its consolidated subsidiaries and affiliates as well as environment-related businesses involving the production of solid fuel from sewage sludge

for use as biomass fuel at coal-fired thermal power plants. In addition, J-POWER is active in innovative power businesses, such as waste power generation and cogeneration systems, and provides technical consulting services in Japan.

#### **Main Projects under Other Business**

(As of April 1, 2017)

Project Name	Location	Business	Ownership (%)	Year Operation Commenced
Kanamachi Filtration Plant PFI* <sup>1</sup> Business	Tokyo metropolitan area	Cogeneration at Kanamachi Filtration Plant of Tokyo metropolitan government's bureau (Gas turbine generator, capacity: 12.28 MW)	20%	2000
Narumi Plant PFI* <sup>1</sup> Business	Aichi Prefecture	Maintenance and operation at Narumi Plant in Nagoya (General waste processing capacity: 530 t/day)	11%	2009
Miyazaki Wood Pellet Project	Miyazaki Prefecture	Demonstration business of an integrated system from manufacturing wood pellets from unused forest offcut, including construction of manufacturing facilities, up to the use of pellets for mixed combustion in J-POWER's coal-fired thermal power plants (Pellet production capacity: 25,000 t/year)	98.3%	2011
Hiroshima City Seibu Water Reclamation Center/Sewage Sludge Fuel Project	Hiroshima Prefecture	Integrated DBO-type*2 sewage sludge-based biofuels recycling project, from the construction of biofuel manufacturing facilities to mixed combustion in J-POWER's coal-fired thermal power plants (Sludge processing capacity: 100 t/day)	33.8%	2012
Kumamoto Sewage Sludge Solid Fuel Project	Kumamoto Prefecture	Integrated DBO-type*2 sewage sludge-based biofuels recycling project, from the construction of biofuel manufacturing facilities to mixed combustion in J-POWER's coal-fired thermal power plants and others (Sludge processing capacity: 50 t/day)	44%	2013
Osaka City Hirano Sewage Treatment Plant/Sludge Solid Fuel Project	Osaka Prefecture	Integrated PFI-type*¹ sewage sludge-based biofuels recycling project, from the construction of biofuel manufacturing facilities to mixed combustion in J-POWER's coal-fired thermal power plants and others (Sludge processing capacity: 150 t/day)	60%	2014
Omuta Waste-Fueled Power Plant	Fukuoka Prefecture	Recycling power generation using solid fuel (RDF: Refuse derived fuel) made by compressing and forming general waste (Generating capacity: 20.6 MW, RDF processing capacity: 315 t/day)	45.2%	2002
Katsuragawa Right Bank Regional Sewerage/Rakusai Sewage Treatment Plant/Sewage Sludge Solid Fuel Project	Kyoto Prefecture	Integrated DBO-type*2 sewage sludge-based biofuels recycling project, from the construction of biofuel manufacturing facilities to mixed combustion in J-POWER's coal-fired thermal power plants and others (Sludge processing capacity: 50 t/day)	49%	2017
Mikasagawa-Nakagawa Regional Sewerage/Mikasagawa Sewage Treatment Plant/Sewage Sludge Solid Fuel Project	Fukuoka Prefecture	Integrated DBO-type*2 sewage sludge-based biofuels recycling project, from the construction of biofuel manufacturing facilities to mixed combustion in J-POWER's coal-fired thermal power plants and others (Sludge processing capacity: 100 t/day)	_	2019 (Planned)

<sup>\*1</sup> PFI (Private Finance Initiative): The method of conducting public-sector projects from construction through the operating stages by drawing on private-sector funding, management know-how, technology, and other resources

know-how, technology, and other resources
\*2 DBO (Design, Build, Operate): A system whereby the public sector finances projects and then commissions the private sector to undertake their design, building, and operation

E (Environment) S (Social)
G (Governance)

## **E** (Environment)

- **30** Environmental Initiatives
- 36 Initiatives toward Carbon Reduction
- **40** Initiatives toward Environmental Preservation
- **41** Preservation of Natural Environment
- 42 Environmental Data

## S (Social)

- **46** Respect for Human Resources
- **49** Health and Safety Management
- **51** Contribution to Society

### G (Governance)

- **52** Corporate Governance
- 57 Compliance & Risk Management
- **60** Emergency Management

## Environment

#### **Environmental Initiatives**

Based on our Corporate Philosophy—"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"—the J-POWER Group engages in the conduct of business that aims for the coexistence of energy and the environment.

Specifically, under our Corporate Conduct Rules and the J-POWER Group Environmental Management Vision, we regard contribution to the reduction of CO<sub>2</sub> emissions on a global scale and the preservation of the local environment as an important issue to be addressed.

In the J-POWER Group Medium-Term Management Plan, which looks ahead to 2025, we also recognize that initiatives to further reduce carbon emissions are necessary in our responses to the risks to be overcome. The development of technologies to further reduce carbon emissions in coal-fired thermal power generation and the expansion of renewable energy compose specific activities under the initiatives.

In line with these policies, the J-POWER Group is promoting specific initiatives toward addressing global environmental issues, including those concerning climate change, and initiatives directed at coexistence with the local environment.

#### J-POWER Group Environmental Management Vision

The J-POWER Group has established a J-POWER Group Environmental Management Vision. Comprising a J-POWER Group Environmental Management Vision Basic Policy and Action Programs, the latter are made up of Corporate Targets and Segment Targets as well as the J-POWER Group

Environmental Action Guidelines that are formulated each year. These are deliberated on at the Environmental Management Promotion Board (and deliberated on by the Executive Committee\* as required), and decided on by the President.

\* Executive Committee: Please refer to page 53.

## J-POWER Group Environmental Management Vision

### J-POWER Group Environmental Management Vision Basic Policy



#### **Action Programs**

#### **Corporate Targets**

Targets addressed by the entire Group which establish medium-term issues to be addressed, targets, and the means

#### **Segment Targets**

Targets established and addressed by each relevant department and subsidiaries

#### J-POWER Group Environmental Action Guidelines

Issues to be addressed for fiscal year

#### **Environmental Management Promotion Structures**

An Executive Vice President serves as the person responsible for environmental management promotion who is in charge of promoting environmental management. In addition to establishing the Environmental Management Promotion Board to promote environmental management, we have established the J-POWER Group Environmental Management Promotion Conference to promote group-wide environmental management.

## J-POWER Group Environmental Management Vision Basic Policy (Revised on July 1, 2011)

#### 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 rest of the world by harmonizing our operations with the environment and ensuring the constant supply of energy essential to human life and economic activity.

As an energy supplier, the J-POWER Group will strive to bring together its expertise and its technologies in the utilization of a wide variety of energy sources, including fossil fuels, nuclear power, and renewable energies, to ensure the efficient and uninterrupted supply of the electric power essential to human life and economic activity.

We will contribute to the sustainable development of Japan and the rest of the world by constantly making efforts to minimize the environmental impact of our business activities, reducing environmental risks such as global warming, and improving eco-efficiency by achieving higher productivity with lower environmental load, thus promoting greater environmental consideration while enhancing economic value.

#### **Efforts Relating to Global Environmental Issues**

Directing our most-intensive efforts towards a stable energy supply, we will also steadily advance initiatives towards lower carbon emissions both domestically and internationally, and will contribute to the reduction of  $CO_2$  emissions on a global scale.

To that end, we will work from mid- and long-term perspectives with technologies as our central focus to realize a stable energy supply and reduction in CO<sub>2</sub> emissions domestically and internationally through measures including "Carbon reduction in coal-fired thermal power generation," "Research and development of next-generation low-carbon technologies," and "Expanding CO<sub>2</sub>-free power generation facilities." Our ultimate aim will be the achievement of zero emissions by means of measures including CO<sub>2</sub> capture and storage.

#### **Efforts Relating to Local Environmental Issues**

We will seek to operate in harmony with the local environments by adopting measures to reduce the environmental impact of our operations while working to save, recycle, and reuse resources in order to limit the amount of waste.

#### **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.



The  $\bigstar$  marks denote data that are the subjects of third-party assurance. (Please refer to page 45.)

## **Corporate Targets and Fiscal 2016 Performance**

The Action Programs for the J-POWER Group Environmental Management Vision define Corporate Targets, which are mid-term targets to be addressed by the Group as a whole. As shown below, all of the items included in the Corporate Targets for fiscal 2016 were achieved.

We will continue to work toward the achievement of our targets in fiscal 2017.

		ltem	Tar	rget	
ı				and reduce CO <sub>2</sub> emissions in Japan and over- looking toward 2020, in addition to con- Action Plan by the Japanese Electric Utility	
			• Work to replace aging coal-fired thermal high-efficiency coal-fired thermal power p		
	<b>5</b>		Promote mixed combustion of biomass fu (Effective exploitation of untapped resour)		
	intal Issue		Contribute to the reduction of global CO; gies by expanding coal-fired thermal pow using J-POWER's advanced, high-efficience.		
	bal Environme	Reducing CO <sub>2</sub> emissions from power generation and promoting technological development	Osaki CoolGen Project. In addition, promo	ming for practical application through the ote research and development on CO <sub>2</sub> cap- ing the results from trial operations under the	
	Efforts Relating to Global Environmental Issues	and promoting technological development	compliance with the new safety standard: December 2014. Based on serious conside Daiichi Nuclear Power Station, do our utm	nost to ensure the construction of a safe oluntary safety measures and obtaining the	
	Effo		• Work to expand the use of hydroelectric pupgrading, and replacing hydroelectric po		
			Work to significantly expand domestic wire and development toward the realization of technologies.		
			Work to develop new geothermal power		
		ltem	Target	Fiscal 2015 Performance	
		• Total thermal efficiency for thermal power (HHV, gross efficiency)	Maintain current level [about 40%]	40.4% (Reference: LHV* = 41.5%)	
		$\bullet$ Reduction of $SF_{\circ}$ emissions; increase recovery rate during inspection and retirement of equipment	Inspection: at least 97% Retirement: at least 99%	Inspection: 99.3% Retirement: 99.4%	
		• Reduce SOx emissions per unit of electric power generated by thermal power	Maintain current level [about 0.2 g/kWh]	0.18 g/kWh	
	lating to nental Issues	• Reduce NO <i>x</i> emissions per unit of electric power generated by thermal power	Maintain current level [about 0.5 g/kWh]	0.50 g/kWh	
		Increase recycling rate for industrial waste	Maintain current level [about 97%]	98.5%	
	Efforts Relating to Local Environmental Issues	Preservation of aquatic environments	Consider protection of river and ocean environments in business activities	Practices of consideration for protection of river and ocean environments	
		Preservation of biodiversity	Consider the protection of biodiversity in business activities	Practices of consideration for biodiversity	
	Ensuring Transparency and Reliability	Improvement of environmental management level	Continual improvement of EMS	Consistent implementation of PDCA cycle	

<sup>\*</sup> LHV (lower heating value) is estimated from actual HHV (higher heating value) using conversion coefficients supplied in the Agency of Natural Resources and Energy's Comprehensive Energy Statistics (Fiscal 2004 edition)

	uction work at the Takehara Thermal Power Plant Replacement Project. ementation of various kinds of environmental impact research for the Takasago Thermal Power Plant Replacement Project.				
	• At the Matsuura Thermal Power Plant, Takehara Thermal Power Plant, and Takasago Thermal Power Plant, we implemented mixed combustion in a suitable manner for each fuel type.				
• In Indonesia, we advanced con	struction work on the Central Java Project.				
• At the Osaki CoolGen Project, we started demonstration tests of oxygen-blown IGCC (Phase 1).  We implemented ongoing efforts toward oxygen-blown IGCC with CO <sub>2</sub> separation and capture (Phase 2).					
new safety standards.	lant Project, we carried out studies for safety enhancement measures and responded to the review of compliance with the nented initiatives to gain the understanding and trust of local residents.				
With regard to the expansion of hydroelectric power, the Konokitani Hydroelectric Power Plant commenced operations.  We increased the capacity and started the operations of the Akiba No. 2 Hydroelectric Power Plant after the comprehensive renewal of its major facilities.					
construction work on the Setar With offshore wind power, c continue the tests as our own i	e Minami Ehime Wind Farm (expansion), Ohma Wind Farm, and Yurihonjo Bayside Wind Farm began operations, and na-Ohsato Wind Farm was started.  Jemonstration tests off Kitakyushu (joint research with NEDO) were completed at the end of fiscal 2016. We plan to research from fiscal 2017 onwards. The consortium including the Company that had responded to the public tender, conking applications for the "installer/operator of the Hibikinada Offshore Wind Power Generation Facility," was selected as				
As development of a new geot	hermal power project in Japan, we made progress with construction work on the Wasabizawa Geothermal Power Plant.				
Fiscal 2016 Performance	Fiscal 2016 Evaluation				
40.3%★ (Reference: LHV* = 41.4%)	The J-POWER Group met its target for total thermal efficiency for thermal power thanks to efforts to maintain high-efficiency operations in existing thermal power plants and to adopt high-efficiency technologies at facilities renewal.				
Inspection: 99.5% ★ Retirement: 99.3%	The target was met, with a recovery rate of 99.5% during inspections and 99.3% at retirement, thanks to efforts to curb emissions during equipment inspection through sound recovery and reuse.				
0.18 g/kWh ★	Efforts including fuel management and the appropriate operations of flue gas desulfurization systems saw us curb our SOx emissions and achieve our target for emissions per unit of electric power generated.				
0.50 g/kWh <b>★</b>	Efforts including fuel management and the appropriate operations of flue gas denitrification systems saw us curb our NOx emissions and achieve our target for emissions per unit of electric power generated.				
98.5%★	We achieved our targets through efforts to promote the recycling of coal ash and to reduce industrial waste generated by the maintenance and operation of power plants.				
Practices of consideration for protection of river and ocean environments	<ul> <li>In operating power generation facilities that are involved with rivers, we implemented measures for the protection of the river environment. These include the implementation of sedimentation disposal measures and measures to mitigate long-term persistence of turbidity according to the conditions at each location.</li> <li>In operating power generation facilities that adjoin the ocean, we implemented precise control over the effluent in compliance with environmental protection agreements and other such arrangements.</li> </ul>				
Practices of consideration for biodiversity	We showed consideration for the protection of ecosystems and the diversity of species in conducting our business activities and worked to protect rare animal and plant species and their habitats.				
Consistent implementation of PDCA cycle	We implemented the PDCA cycle consistently and worked to raise the level of environmental management.				



## Fiscal 2017 J-POWER Group Environmental Action Guidelines

## 1 Efforts Relating to Global Environmental Issues

## Reducing Carbon Emissions from Coal-Fired Thermal Power Generation

- Maintain high-efficiency operation at existing thermal power stations
- Promote biomass fuel mixed combustion in existing thermal power stations
- Implementation of replacement plans for existing thermal power stations
  - Replace the Takehara Thermal Power Station Units No. 1 and 2 and the Takasago Thermal Power Station Units No. 1 and 2 with the latest USC plants in order to greatly improve efficiency
- Transfer high-efficiency coal-fired thermal power generation technologies overseas and promote their diffusion
  - Using J-POWER's advanced, high-efficiency power generation technologies, contribute to the reduction of global CO<sub>2</sub> emissions and the transfer of our technologies by expanding high-efficiency coal-fired thermal power generation business especially in Asia

#### Research and Development of Next-Generation Low-Carbon Technologies

- Proceed with large-scale demonstration tests of oxygenblown integrated coal gasification combined cycle (IGCC)
  - Proceed with the Osaki CoolGen Project to develop high-efficiency IGCC generation technologies
- Proceed with development of CO<sub>2</sub> capture and storage (CCS) technologies
  - Steadily proceed with the phase 2 of the Osaki CoolGen Project, making use of the results of pre-combustion CO<sub>2</sub> capture technology developed in the EAGLE Project.
- ullet With regard to the transportation and storage of CO $_2$ , we advance basic research aiming to evaluate the technical risks and economic efficiency.

#### Expanding CO<sub>2</sub>-Free Power Generation Facilities

- Promote the Ohma Nuclear Power Plant Project, with safety as the top priority
  - In relation to the Ohma Nuclear Power Plant Project, respond appropriately to the review of compliance with the new safety standards, an application for which was submitted in December 2014. Based on serious consideration of the accident at the Fukushima Daiichi Nuclear Power Station, do our utmost to ensure the construction of a safe and trusted nuclear power plant, taking voluntary safety measures and obtaining the understanding of the local community where the plant site is located
- Expand use of renewable energies
  - Maintain stable operation of existing hydroelectric, geothermal, wind, and recycle power stations
  - Improving efficiency through replacement of existing hydroelectric power facilities
     Proceed with new hydroelectric, geothermal, and wind power developments
     Described in the second of the control of the c
  - Particularly in the case of wind power, in addition to proceeding with development toward the significant expansion of capacity, advance examinations toward the realization of offshore wind power projects
  - Proceed with development of renewable energy and support of it in developing countries

#### Other

- Promote energy saving
- Promote reduction of internal consumption rate at power stations
- Take the initiative in energy conservation in the offices throughout the Group in view of the current state of the power supply and demand situation
- Promote energy conservation measures in offices with consideration of criteria for judgment stipulated for businesses by the Energy Conservation Act
- Work to conserve energy at our Headquarters toward compliance with the Tokyo Metropolitan Ordinance on Environmental Protection

- Reduce environmental load by promoting initiatives such as improvement of efficiency when transporting raw materials, etc.
- Reduce environmental load through measures including use of public transportation, improved operation efficiency of company vehicles, and promotion of eco driving
- Promote energy and resource-conserving measures in employees' households, such as use of the Household Eco-Account Book
- Support measures to promote the spread of energy conservation
- Utilization and promotion of the offset credit mechanism
- Reduce release of GHGs other than CO<sub>2</sub>
  - ullet Curtail emissions of greenhouse gases other than  $CO_2$ , such of  $SF_e$  (sulfur hexafluoride), CFCs (chlorofluorocarbons), HCFCs (hydrochlorofluorocarbons), HFCs (hydrofluorocarbons), and  $N_eO$  (nitrous oxide)

### 2 Efforts Relating to Local Environmental Issues

## Reduction of Emissions of Environmentally Loading Substances

- Continue to reduce emissions
  - Properly manage condition of combustion and environmental equipment in order to reduce emissions of SOx, NOx, soot, and dust
- Properly manage wastewater treatment facilities to reduce discharges of substances causing water pollution
- Properly manage facilities to reduce noise, vibration, and odors
- Properly manage facilities to prevent pollution of soil and groundwater
- Strengthen measures to prevent oil spills from equipment, etc. and be prepared so that emergencies can be dealt with in an appropriate and timely manner
- Design and introduce highly efficient environmental equipment when newly installing or renovating facilities

## Promotion of the 3Rs (Reduce, Reuse, and Recycle waste) and Proper Disposal of Waste

- Make efforts toward reuse and recycling of recyclable resources and zero emissions of waste
- Promote reduction of waste, and reuse and recycling of materials and equipment when new installation, upgrading, and demolition of facilities,
- Work to reduce quantities used of water, chemicals, lubricating oil, etc.
- Work to curb volume of office waste (copy paper, etc.) and promote reuse
- Rigorously collect and separate paper, bottles, cans, plastic, and other waste, and promote reuse and recycling
- Maintain and continue green purchasing efforts in line with the J-POWER Group Green Purchasing Guidelines
  - Maintain and continue green purchasing of office goods
- Maintain and continue the use of low-pollution vehicles, etc.
- Properly maintain and manage final disposal sites and properly implement closing procedures for them

#### **Management of Chemical Substances**

- Fully comply with the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (PRTR Act)
  - Survey and manage the amounts of chemical substances subject to the PRTR Act that are emitted and transported, notify the appropriate authorities, and disclose this information
- Take appropriate measures to deal with dioxins
- Appropriately manage waste incinerators, and survey and report on exhaust gases and ash in accordance with the Act on Special Measures against Dioxins
- Observe the stipulations of the Waste Disposal and Public Cleansing Act and the Act on Special Measures against Dioxins when waste incinerators are scrapped

## Management and treatment of PCB waste and products containing PCBs

- Appropriately store and manage them based on the stipulations of the Waste Disposal and Public Cleansing Act, the Act on Special Measures concerning Promotion of Proper Treatment of PCB Wastes, the Electricity Business Act, and the Fire Service Act
- Progressively treat PCB waste and products containing PCBs in accordance with the J-POWER Group's Basic Policy for the Treatment of PCBs
- Strive to reduce volumes of toxic chemicals handled
- Respond appropriately to asbestos-related issues
- Adopt appropriate measures to manage asbestos including prevention of dispersion and systematically removing asbestos and replacing it with alternative substances based on the J-POWER Group's Basic Policy concerning Asbestos

#### Measures to Protect the Natural Environment

#### Take the natural environment into account in the various stages of business

- Recognizing that the blessings of the natural environment support a rich and secure lifestyle, conduct surveys, estimates, and assessments as necessary of the impact of business activities on the natural environment, and work to protect the natural environment at each stage of the business process, including the planning, design, construction, and operation of power stations
- Consideration for aquatic environments
  - In operating power generation facilities that are involved with rivers, we will steadily promote measures for the protection of the river environment. These include the implementation of sedimentation control measures and measures to mitigate long-term persistence of turbidity under way according to the conditions at each location.
- In operating power generation facilities that adjoin the ocean, we will implement precise control over the effluent in compliance with environmental protection agreements and other such arrangements.
- Showing consideration for biodiversity
- We will show consideration for the protection of ecosystems and the diversity of species in conducting our business activities, and we will strive to protect rare animal and plant species and their habitats.
- Implement forest protection initiatives
  - Institute appropriate protections for company-owned forests based on the J-POWER Group Forest Protection Guidelines
- Promote the use of unexploited offcuts in forests

# **Environmental Conservation Initiatives in Overseas Projects**

- Promote overseas transfer of environmental protection technologies
  - Promote transfer of environmental protection technologies for thermal and hydroelectric power generation
- Incorporate environmentally friendly initiatives when formulating development plans and considering investment in projects, and ensure that those initiatives are carried out

# Implementation of Accurate Environmental Impact Assessments

Conduct surveys, estimates, and assessments of environmental impact of business
activities in accordance with the applicable laws and regulations, reflect the results
in the details of business activities, and thus consider environmental protection

#### Ensuring Transparency and Reliability

# 1. Continual Improvement of Environmental Management (Greater Reliability)

#### Improvement of Environmental Management Level

- Continue to improve operation of the environmental management system (EMS) at each J-POWER Group company
  - Assess the actual status of environmental load and set targets and formulate plans for the protection of the environment
  - Systematically conduct internal environmental audits and periodically evaluate and improve details of environmental activities in order to meet targets
  - Take measures to enhance check functions with the aim of maintaining and improving internal environmental audits
  - Make improvements through activities concerning ISO 14001, in the case of certified business sites
- Raise employee awareness of environmental issues
- Systematically conduct education and training programs regarding environmental laws and regulations applicable to business activities
- Promote environmental education using e-learning, etc.
- Request business partners including contractors for cooperation in environmentally friendly business operations
- Strengthen risk management
- Work to implement measures to prevent environmentally harmful incidents and ensure essential communication and appropriate responses in an emergency

# Full Compliance with Laws, Regulations, Agreements, and Other Rules

- Identify applicable laws, regulations, agreements, and other rules, and make them recognized and complied with in business operations
  - Accurately identify laws and regulations, agreements, etc. applicable to business activities, and work to make them appropriately responded, well recognized, and applied, while verifying the compliance
- Fully comply with environment-related laws, regulations, agreements, and other rules
  - Make precise improvements to equipment and operations in order to prevent pollution of the surrounding environment
  - Conduct risk diagnoses in relation to waste and education programs for employees engaged in waste disposal in order to ensure appropriate disposal of waste. In addition, promote application of the J-POWER Group Guidelines for Deciding Industrial Waste Disposal Contractors and the expansion of use of electronic manifests.

# 2. Communication with Society (Greater Transparency)

#### **Disclosure of Environmental Information**

- · Formulate environmental reports
  - In disclosing environmental information by the environmental report, we refer to guidelines such as the "Environmental Reporting Guidelines" of the Ministry of the Environment and carry out reporting in consideration of social demands.
  - With regard to the content of the environmental report, we work to increase reliability and transparency by means such as reviews by third parties.

#### Increased Engagement in Environmental Communication

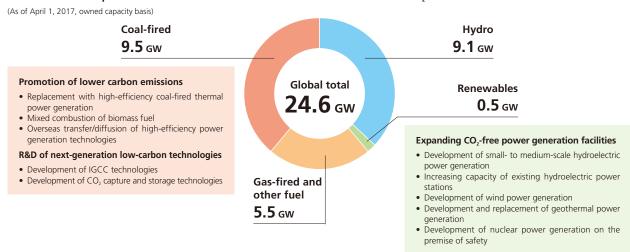
- · Carry out environmental communication
- Conduct publicity programs via website, internal Group publications, etc.
- Conduct publicity programs targeting visitors to offices, PR centers, etc.
- Communicate with experts and other third parties
- Receive external assessments such as environmental ratings
- Conduct environment-related social contribution activities such as providing support for environmental education
- Carry out regional environmental protection activities
- Independently implement regional environmental protection activities
- Participate in cleanup events, beautification activities, tree planting events, and similar activities organized by cities, towns and villages, neighborhoods, etc.

#### **Initiatives toward Carbon Reduction**

Our Corporate Philosophy is "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." In line with this philosophy, the J-POWER Group is working to both ensure the stable supply of electric power and promote environmental preservation. Around the world, the Group owns a variety of types of power generation facilities including hydroelectric, coal-fired thermal, gas-fired thermal, and other renewables, maintaining a balanced portfolio of facilities.

Going forward, the J-POWER Group will continue to advance the development of such CO<sub>2</sub>-free power generation as hydroelectric, wind, geothermal, and nuclear power while also reducing carbon emissions from coal-fired thermal power generation and advancing R&D of next-generation low-carbon technologies. By doing so, we will strive to both ensure a stable supply of electric power and reduce CO<sub>2</sub> emissions.

#### The J-POWER Group's Power Generation Facilities and Initiatives toward Lower CO<sub>2</sub> Emissions

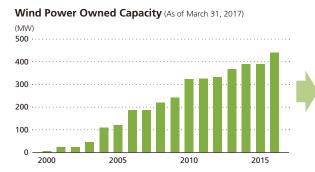


#### Expanding CO<sub>2</sub>-Free Power Generation Facilities

#### Wind Power: Development of New Facilities

# Capacity Share in Japan (As of March 31, 2017) J-POWER 0.4 GW 15%

Sources: Compiled from *Electric Power Survey Statistics* (Agency for Natural Resources and Energy) and other sources



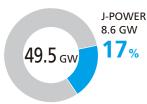
#### **New Development Projects**

- Setana-Ohsato
- Kuzumaki No. 2
- Nikaho No. 2
- Hibikinada Offshore

#### **Hydroelectric: Development of Small- to Medium-Scale Facilities**

#### Capacity Share in Japan

(As of March 31, 2017)



Sources: Compiled from *Electric Power Survey*Statistics (Agency for Natural Resources and Energy) and other sources

Major plants	Capacity (MW)
Shintoyone	1,125
Okukiyotsu	1,000
Okutadami	560
Tagokura	400
Sakuma	350
Ikehara	350
Tedorigawa No. 1	250
Miboro	215

New Development of Small- to Medium-Scale Hydroelectric Projects

Shinkatsurazawa/Kumaoi

**Capacity Increasing Project for Existing Power Stations** 

• Akiba No. 1

#### **Geothermal: New Development and Replacement**

Project Name	Location	Capacity (kW)	Ownership	Status
Wasabizawa (New)	Yuzawa City, Akita Prefecture	42,000	50%	Under construction (scheduled to start operations in fiscal 2019)
Onikobe (Replacement)	Osaki City, Miyagi Prefecture	15,000 class	100%	Under environmental assessment (scheduled to start operations in fiscal 2023)

#### **Nuclear Power: New Development**

Project Name	Location	Capacity (kW)	Status
Ohma	Ohma-machi, Shimokita-gun, Aomori Prefecture	1,383,000	Under review of compliance with new safety standards (timing of start of operations to be determined)

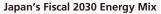
#### **Reducing Carbon Emissions from Coal-Fired Thermal Power**

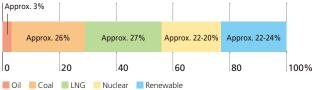
# The Position of Coal-Fired Thermal Power in Japan's Energy Policy

In resource-poor Japan, which depends on imports for most of its fossil fuels, it is important to realize the so-called S+3Es—Energy Security (stability of energy supplies), Economic efficiency, and compatibility with the Environment—by utilizing a variety of energy sources in a well-balanced manner while ensuring Safety.

Of the fossil fuels, coal is subject to the least geopolitical risks and shows the lowest import cost per calorie upon arrival in Japan. As such, coal-fired thermal power represents an important baseload power source that has an advantage in a stable fuel supply and economic efficiency. It is thus in Japan's interest to use this power source while working to reduce its environmental load through such means as effectively employing high-efficiency coal-fired thermal power generation technologies. In Japan's target energy mix for fiscal 2030, approximately 26% of electricity is to be generated by coal-fired thermal power.

The J-POWER Group is working to reduce carbon emissions by replacing aging coal-fired thermal power generation facilities with high-efficiency facilities that employ the world's highest-level technologies, and also by new development for high-efficiency coal-fired thermal power plants. Furthermore, by promoting mixed combustion of biomass fuels, we are advancing the further reduction of carbon emissions from coal-fired thermal power generation.





Sources: Related Materials to Long-term Energy Supply and Demand Outlook (Agency for Natural Resources and Energy, July 2015)

# **Balance between Global Stable Energy Supply** and Carbon Reduction

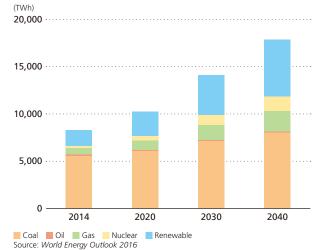
There are 1.2 billion people, accounting for nearly 20% of the world's total population, for whom electricity remains inaccessible, and 2.7 billion people who use firewood and livestock manure as fuel for cooking\*. The supply of electricity is an urgent matter to improve the living standards of people in such areas. Particularly in areas where coal resources exist in the country, we believe that the supply of electricity using high-efficiency coal-fired thermal power generation will become a plausible choice, which is stable, inexpensive and also geared toward carbon reduction.

Even in Asia, where the demand for electricity is rising, coal-fired thermal power, which is superior in both stable supply and economic efficiency, is required for economic development. The coal-fired thermal power project at Central Java in Indonesia, which the J-POWER Group is currently developing, aims for installing a high-efficiency coal-fired thermal power plant that will utilize coal that exists in abundance in Indonesia where a sharp rise in demand for electricity is expected.

The J-POWER Group will globally contribute to both stable energy supply and carbon reduction by utilizing overseas our world's highest-level technologies in high-efficiency coal-fired thermal power generation which we have built up in Japan.

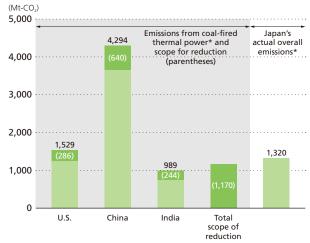
\*Source: World Energy Outlook 2016

#### **Electricity Generation in Developing Asian Countries**



# ${\rm CO}_{\scriptscriptstyle 2}$ Reduction Capability of High-Efficiency Coal-Fired Thermal Power Generation Technologies

If we were to replace coal-fired thermal power plants in the United States, China, and India with Japan's highest-efficiency coal-fired thermal power technologies, the scope for reducing  $\mathsf{CO}_2$  would be comparable to Japan's total  $\mathsf{CO}_2$  emissions.



<sup>\*</sup> Fiscal 2014 results

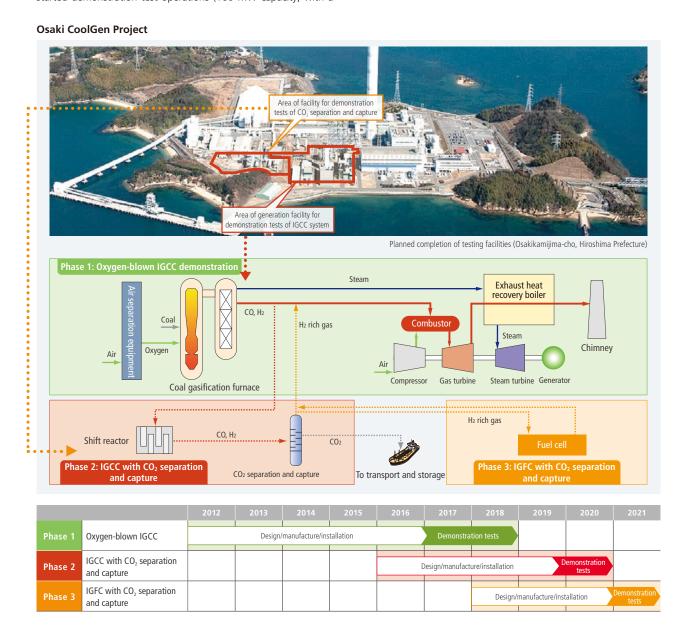


#### Developing Next-Generation, Coal-Fired Thermal Power Technologies and Low-Carbon Technologies

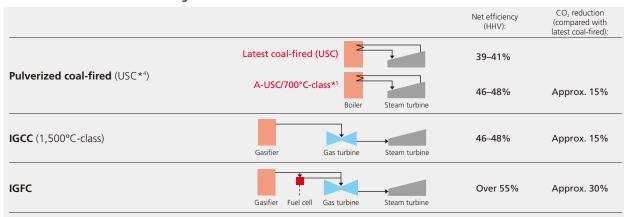
J-POWER is working to establish next-generation coal-fired thermal power generation technologies by developing integrated coal gasification combined cycle (IGCC\*1) technologies and integrated coal gasification fuel cell combined cycle (IGFC\*2) technologies as well as CO<sub>2</sub> capture and storage (CCS) technologies. Since fiscal 2002, J-POWER had been engaged in the EAGLE\*3 Project in collaboration with the New Energy and Industrial Technology Development Organization (NEDO), aimed at establishing technologies to realize oxygen-blown IGCC. Employing insights and results gleaned from the EAGLE Project, the Company has since been engaged in the Osaki CoolGen Project in collaboration with The Chugoku Electric Power Co., Inc. We are planning a demonstration test of oxygen-blown IGCC in Phase 1; a demonstration test of IGCC with CO<sub>2</sub> separation and capture in Phase 2, which add CO<sub>2</sub> separation and capture to Phase 1; and a demonstration test of IGFC with CO<sub>2</sub> separation and capture in Phase 3, which add fuel cells to Phase 2. For Phase 1, we have already completed the construction and trial operations of the IGCC facility and have started demonstration test operations (166 MW capacity, with a coal consumption volume of 1,180 tons per day) in March 2017. In addition, we are currently proceeding with the detailed design of the CO<sub>2</sub> separation and capture facilities for Phase 2.

J-POWER conducted pilot trials aiming for the development of CO<sub>2</sub> separation and capture technologies from fiscal 2007 to 2008 at the Matsushima Thermal Power Plant (Saikai City, Nagasaki Prefecture) in collaboration with Mitsubishi Heavy Industries, Ltd. as one of other initiatives to reduce carbon emissions. Additionally, at the Callide A Power Plant in Queensland, Australia, J-POWER took part in the world's first trials of an integrated process of oxy-fuel and CCS at a real power plant as part of a public-private, Japanese-Australian joint project.

- \*1 Integrated coal gasification combined cycle (IGCC): A combined cycle power generation system with a twin-turbine configuration; a gas turbine driven by the gas produced by gasifying coal and a steam turbine driven by the exhaust gases from the gas turbine
- \*2 Integrated coal gasification fuel cell combined cycle (IGFC): An integrated power generation system that combines fuel cells with IGCC which achieves the highest level of thermal efficiency as coal-fired thermal power
- \*3 EAGLE: An oxygen-blown coal gasification project which was conducted at the Wakamatsu Research Institute. The acronym is taken from Coal Energy Application for Gas, Liquid & Electricity.

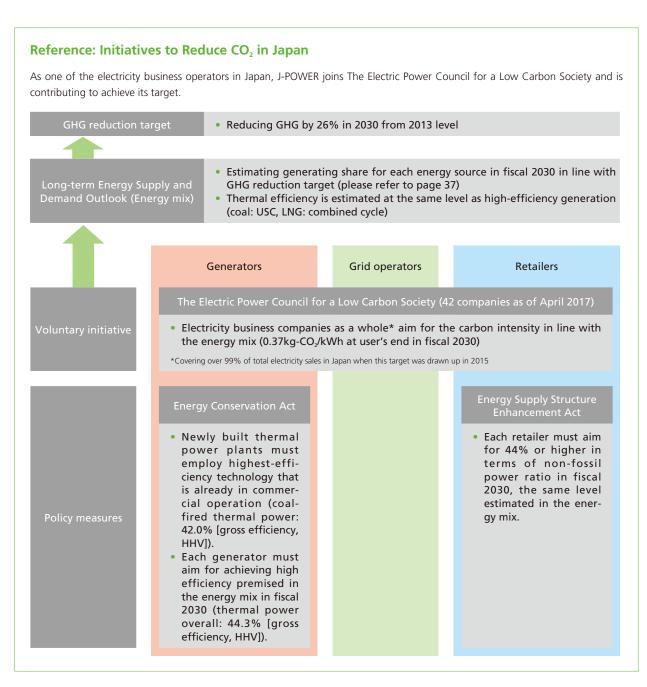


#### **Coal-Fired Thermal Power Technologies for the Next Generation**



<sup>\*4</sup> Ultra-Supercritical (USC): Current cutting-edge technology for pulverized coal-fired thermal power. Utilizes steam with pressure of 22.1 MPa or greater and temperature of over 566°C

<sup>\*5</sup> Advanced Ultra-Supercritical (A-USC): By the adoption of steam condition at more than 700°C, increasing the thermal efficiency of USC



#### **Initiatives toward Environmental Preservation**

The ★ marks denote data that are the subjects of third-party assurance. (Please refer to page 45.)

The J-POWER Group Environmental Action Guidelines call for the reduction of emissions of environmentally loading substances such as SOx, NOx, soot and dust, resource conservation, reduction of waste, and the appropriate management of chemical substances. (Please refer to page 34.)

#### **Environmentally Loading Substances**

The J-POWER Group undertakes environmental preservation initiatives using the latest technologies and knowledge to reduce the environmental load caused by its domestic and overseas electric power businesses.

# Examples of Environmental Preservation Measures for Coal-Fired Thermal Power Plants

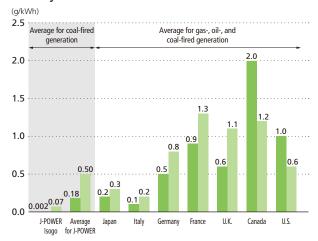
Combustion of coal and other fuels can generate sulfur oxides (SOx), nitrogen oxides (NOx), and soot and dust. To reduce these emissions, we have improved our combustion methods and installed such flue gas treatment equipment as desulfurization and denitrification systems and electrostatic precipitators. Although the performance of equipment varies with its date of installation, at each facility, we have installed the newest technology available at the time to remove pollutants with high efficiency. This equipment operates automatically Prevent Air with the aid of measurement devices that continuously monitor the content of Pollution flue gas. In addition, human operators monitor the equipment 24 hours a day and are able to mount a swift response in the event of any malfunction, ensuring that our emissions do not exceed the benchmark figures specified by the Air Pollution Control Act and environmental protection agreements Our performance for fiscal 2016 in SOx, NOx, and soot and dust emissions is shown in the below table. The figures obtained are quite low by comparison with other countries. At our coal-fired power stations, we implement various measures to prevent dispersal of dust during handling of coal and coal ash, including the use of closed conveyor belts and silos, as well as windshielding and spraying as dictated by Control Coal topographical and weather conditions. At our coal ash landfill disposal sites, soil Dust, etc. is spread over the surface, and leachate is treated with appropriate treatment We implement various measures to prevent the leakage and dispersion of fuel Measures to oil, lubricating oil, and other such substances within power station grounds, Prevent Oil Leaks including keeping adsorbent materials constantly ready in our power stations. From fiscal 2004 through 2006, we conducted studies at all J-POWER Group Measures to domestic sites and determined that they were free of soil or groundwater con-**Prevent Soil** tamination. We will continue working diligently to ensure that no soil pollution Pollution

#### Fiscal 2016 SOx, NOx, and Soot and Dust Emissions Performance★

Substance	Emissions	Emissions intensity*1
SOx	10.2 thousand tons	0.18 g/kWh
NOx	27.8 thousand tons	0.50 g/kWh
Soot and dust*2	1.0 thousand tons	0.02 g/kWh

<sup>\*1</sup> Emissions intensity: Emissions per unit of electricity generated at thermal power stations \*2 Emissions of soot and dust are calculated on the basis of measurements taken monthly.

# International Comparison of SOx and NOx Emissions Intensity for Thermal Generation



Sulfur oxides (SOx) Nitrogen oxides (NOx)

Notes: 1. Emissions: OECD StatExtracts

Power generated: IEA Energy Balances of OECD Countries, 2016 Edition 2. J-POWER and Isogo figures are fiscal 2016 results.

#### Waste

#### **Reduction and Effective Utilization of Waste**

The J-POWER Group's target for the industrial waste recycle rate is 97%. The total amount of industrial waste we generated in fiscal 2016 was 2.10 million tons, and we achieved a recycle rate of 98.5%

#### Making Effective Use of Coal Ash and Gypsum

The J-POWER Group's industrial waste consists of 97% coal ash and gypsum from thermal power stations.

#### Breakdown of the Coal Ash Recycle (displacement tons)



Note: Sums of figures may not equal totals in some cases due to rounding.

# Information on Maintenance and Management of Industrial Waste Final Disposal Sites

The J-POWER Group discloses on its website its maintenance and management information for industrial waste final disposal sites, including the maintenance and management plan, the results of groundwater and discharge water quality analyses, inspection results, and the volume of landfill waste.

#### **Chemical Substances**

#### **Management of Chemical Substances**

The J-POWER Group complies with applicable laws and regulations and properly uses, stores, controls, and treats chemical substances regulated by the PRTR Act, dioxins, PCB waste material (including equipment that contains trace amounts of PCB), materials that contain asbestos, and other substances that are used in power plants or are included in equipment or machinery.

#### PRTR Substance Release and Transfer Volumes (Fiscal 2016)

Substance	Use	Volume handled	Volume released	Volume transferred as waste
33: Asbestos	Insulation for equipment	22.65 t/y	_	22,653 kg/y
71: Ferric chloride	Wastewater treatment agents	14.80 t/y —		14,800 kg/y
80: Xylene	Coating for machinery	2.46 t/y	1,585 kg/y	_
240: Styrene	Coating for machinery	1.93 t/y	1,934 kg/y	_
296: 1,2,4 -Trimethylbenzene	House boiler fuel	1.02 t/y	10 kg/y	_
300: Toluene	Fuel for power generation		16,794 kg/y	_
405: Boron compounds	Manure additives	16.31 t/y	0.4 kg/y	=
406: PCB	Transformer insulation oil	3.28 t/y		3,280 kg/y

Note: Figures represent the 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.

# **Preservation of Natural Environment**

In an effort to preserve the natural environment, in the J-POWER Group Environmental Action Guidelines, we state that we take the natural environment into account in the various stages of business and give consideration to aquatic environments and biodiversity, as well as implementing forest protection initiatives. (Please refer to page 35.)

#### **Environmental Impact Assessment**

Before building or expanding power plants, we conduct environmental impact assessments in accordance with applicable laws and regulations and adequately take the environment into consideration while listening to the opinions of local residents during the planning stages. After a power plant becomes operational, we take environmental preservation measures referring to the results of monitoring performed pursuant to environmental protection agreements entered into with relevant local governments.

# Environmental Impact Assessments in Process from Fiscal 2016 Onward (Projects after submission of a planning stage statement are listed.)

Project	Operator	Implementation area	Implementation status
The New No. 1 and 2 units renewal project at Takasago Thermal Power Station	J-POWER	Takasago City, Hyogo Prefecture	Scoping document review completed (in July 2015)
Renewal project at Onikobe Geothermal Power Station	J-POWER	Osaki City, Miyagi Prefecture	Scoping document review completed (in July 2017)
The No. 2 unit installation project at Kashima Thermal Power Station	Kashima Power Co., Ltd.	Kashima City, Ibaraki Prefecture	All procedures completed (in August 2016) Construction work started (in November 2016)
Nishi-Okinoyama Thermal Power Station (tentative name) installation project	Yamaguchi-Ube Power Generation Co., Ltd.	Ube City, Yamaguchi Prefecture	Scoping document review completed (in April 2016)
Shin-nikaho Wind Farm Project (tentative name)	sho Wind Nikaho City, Akita ject J-POWER Profesture		All procedures completed (in April 2016) Construction work started (in July 2017)
Minami Ehime No. 2 Wind Farm Project (tentative name)	J-POWER	Uwajima City, Ehime Prefecture	Scoping document review completed (in January 2016)
Kaminokuni No. 2 Wind Farm Project (tentative name)	J-POWER	Kaminokuni-cho, Hiyama-gun, Hokkaido Prefecture	Scoping document under review (as of July 2017)

#### **Preservation of Aquatic Environments**

From fiscal 2013 onward, the preservation of aquatic environments has been placed as one of the Corporate Targets for the J-POWER Group Environmental Management Vision with the aim of reinforcing our environmental preservation initiatives regarding rivers and the seas.

We undertake environmental preservation measures based on the specific regional environment and characteristics of each business site such as taking measures regarding water quality and accumulation of silt in dam lakes and downstream areas in the case of hydroelectric power stations, and managing the effluent into nearby oceans in accordance with applicable laws and regulations in the case of thermal power stations.

# Examples of Aquatic Environment Preservation Measures for Coal-Fired Thermal Power Plants

Measures to Prevent Water Pollution	Wastewater from such facilities as desulfurization units and offices is appropriately treated in integrated wastewater treatment systems, through coagulation, precipitation, filtration, and so forth. Treated water is always monitored by automatic measuring equipment and analyzed periodically to ensure that it meets the standards set under the Water Pollution Prevention Act and environmental protection agreements.
Measures to Control Thermal Water Discharge	Seawater taken in to cool the steam used in power generation is released as thermal water discharge*. We control intake and discharge properly to reduce their impact on marine life in the vicinity, and monitor the temperature of thermal water discharge on a 24-hour basis to ensure that it remains at or below the reference values established by environmental protection agreements.
Cutting Back on Industrial Water Use	Industrial water is used in such equipment as boilers, cooling systems, and wet-type desulfurization systems. Part of this water is released into the atmosphere as steam. We are working to recover and reuse wastewater that is not released into the atmosphere as far as possible, in order to reduce our consumption of industrial water.

\* Thermal water discharge:
In thermal and nuclear power generation, the steam that has powered the turbine is cooled and turned to water in a condenser and used again in the boiler. In almost all power stations in Japan, seawater is used for cooling in the condensers. As the seawater cools the steam passing through the condenser, its temperature rises. It is then returned to the ocean through the discharge outlet, at which point it is referred to as thermal water discharge.

#### **Preservation of Forest**

J-POWER owns forests in the areas near its hydroelectric power facilities located throughout Japan. We appropriately maintain these valuable forests in accordance with the Forest Protection Guidelines (formulated in 2007).

Japan's forests are falling into ruin because of inadequate management caused by slumping forestry markets, but the J-POWER Group is contributing to forest protection as well as the reduction of  $CO_2$  emissions, through efforts to combust biomass fuel pellets made from forestry offcuts and other materials in coal-fired thermal power stations along with coal.

#### **Preservation of Biodiversity**

To reinforce our measures in light of the Basic Act on Biodiversity, from fiscal 2011 onward, the preservation of biodiversity has been placed as one of the Corporate Targets for the J-POWER Group Environmental Management Vision.

During the planning and design stages of power generation facilities, we implement environmental preservation measures taking into consideration the impact on habitats and breeding environments as well as on ecological systems based on the results of environmental impact assessment for wildlife and ecological systems in the land and ocean areas surrounding the facilities. We strive to preserve wildlife living in the vicinity of operating power plants, particularly rare species, and their habitats.

These measures are tailored to local environments and characteristics. For example, every effort is made to avoid outdoor work during the nesting season of the Japanese golden eagle and other endangered birds in the vicinity of the Okutadami Dam and Otori Dam. Another example is the restoration, maintenance, and management of marshes that became landfill areas when the Okutadami Dam was expanded.

#### **Environmental Data**

The ★ marks denote data that are the subjects of third-party assurance. (Please refer to page 45.)

#### **Environment-Related Data**

The following data represent annual values or year-end values in each fiscal year. Unless specifically noted, includes data for Group companies\*1.

\*1: J-POWER and its 27 consolidated domestic subsidiaries which are engaged in electric power business, electric power related business, and other business. The amounts attributed to consolidated subsidiaries are based on percentages corresponding to J-POWER's equity share. For information on companies included in the statistics, please refer to the list of Major Group Companies on page 94. (However, the Usage of Specified CFCs and the SF<sub>6</sub> emissions and handled amount in the Greenhouse Gas Emissions are aggregate amounts from consolidated subsidiaries in the totals.)

Note: Sums of figures may not equal totals in some cases due to rounding.

#### **Fuel Consumption**

	Unit	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016*
Coal (dry coal 28 MJ/kg equivalent)	million t	18.04	18.49	18.61	18.10	18.83	17.73
Use intensity (coal-fired thermal power)	t/GWh	338	338	340	341	342	340
Natural gas	million m <sup>3</sup> N	142	148	172	173	116	160
Heavy oil	million kl	0.04	0.05	0.06	0.04	0.05	0.04
Diesel	million kl	0.03	0.02	0.02	0.02	0.02	0.02
Biomass	million t	0.02	0.02	0.03	0.02	0.03	0.02

Note: Denominators for use intensity represent electric power sold by coal-fired thermal power stations

#### Greenhouse Gas Emissions\*2

		Unit	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016*
CO <sub>2</sub> emissions (domestic and overseas power generation)* <sup>3</sup>		million t-CO <sub>2</sub>	52.24	54.09	56.33	55.77	59.11	55.24
CO <sub>2</sub> emission inten	sity	kg-CO₂/kWh	0.67	0.67	0.68	0.67	0.64	0.65
CO <sub>2</sub> emissions (domestic power g	eneration)	million t-CO <sub>2</sub>	46.77	47.56	47.84	46.49	48.20	45.52
CO <sub>2</sub> emission inten	sity	kg-CO₂/kWh	0.71	0.73	0.74	0.73	0.72	0.73
SF <sub>6</sub>	Emissions	t	0.1	0.1	0.0	0.0	0.1	0.1
	Handled	t	11.1	6.5	7.7	7.5	11.0	10.2
	Recovery rate	%	99	99	99	99	99	99
HFC emissions*4		t	0.1	0.2	0.2	0.1	0.1	0.1
N₂O emissions		t	1,660	1,362	1,553	1,576	1,715	1,107

#### J-POWER Group Total Thermal Efficiency for Thermal Power Generation (Gross Efficiency)

	Unit	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016*
Total thermal efficiency (gross efficiency, HHV)	%	40.6	40.5	40.3	40.2	40.4	40.3

#### **Usage of Specified CFCs**

		Unit	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Specified CFCs	Inventory	t	1.0	1.0	1.0	1.0	1.0	1.0
	Emissions	t	0.0	0.0	0.0	0.0	0.0	0.0
Halons	Inventory	t	4.6	4.6	4.6	4.6	4.7	4.7
	Emissions	t	0.0	0.0	0.0	0.0	0.0	0.0
Other CFCs	Inventory	t	11.4	10.8	10.8	10.4	6.2	5.8
	Emissions	t	0.2	0.1	0.1	0.1	0.1	0.0
HFCs	Inventory	t	12.0	12.9	13.3	14.4	15.2	20.0
(CFC alternatives)	Emissions *	t	0.1	0.2	0.2	0.1	0.1	0.1

<sup>\*2:</sup> CO<sub>2</sub> is calculated regarding emissions from fuel combustion for power generation. Other greenhouse gases (PFC, CH<sub>4</sub>, and NF<sub>3</sub>) are effectively not emitted. Calculation of CO<sub>2</sub> emissions is performed in accordance with the Act on Promotion of Global Warming Countermeasures for both Japan and overseas.
\*3: This covers J-POWER as well as consolidated subsidiaries and equity method affiliates, which are engaged in electric power business and overseas business, etc. (12 domestic and 32 overseas companies). The amounts attributed to consolidated subsidiaries and equity method affiliates are based on the percentages of J-POWER's equity share. For information on companies included in the statistics, please refer to the list of Major Group Companies on page 94. \*4: The same tabulation method as for Usage of Specified CFCs was used.

Note: Denominators for emission intensity represent electric power sold.

#### SOx, NOx, and Soot and Dust Emissions

		Unit	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016*
SOx	Emissions	thousand t	12.1	12.3	10.7	9.8	10.7	10.2
	Intensity (thermal)	g/kWh	0.21	0.21	0.18	0.17	0.18	0.18
NOx	Emissions	thousand t	28.5	30.3	31.1	29.1	29.8	27.8
	Intensity (thermal)	g/kWh	0.48	0.51	0.52	0.51	0.50	0.50
Soot and dust	Emissions	thousand t	0.7	0.8	0.8	0.8	0.8	1.0
	Intensity (thermal)	g/kWh	0.01	0.01	0.01	0.01	0.01	0.02

#### **Industrial Waste Recycling**

	Unit	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016*
Volume generated	million t	2.38	2.30	2.32	2.14	2.25	2.10
Volume recycled	million t	2.33	2.26	2.27	2.11	2.22	2.07
Recycle rate	%	98	98	98	99	99	99

#### **Coal Ash and Gypsum Recycling**

		Unit	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016*
Coal ash	Volume generated	thousand t	1,957	1,900	1,928	1,773	1,852	1,719
	Volume recycled	thousand t	1,939	1,882	1,906	1,760	1,839	1,708
	Recycle rate	%	99.0	99.0	98.9	99.2	99.3	99.4
Gypsum	Volume generated	thousand t	362	352	322	304	318	310
	Recycle rate	%	99.8	99.9	100	100	100	100

#### Office Power Consumption

	Unit	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Power consumed by offices (company total)	GWh	19.40	19.48	19.04	19.51	19.61	20.83
Head office*5 Power consumption	GWh	7.31	6.99	6.94	6.39	6.41	6.37
Lighting/power sockets	GWh	1.25	1.33	1.29	1.26	1.25	1.22

\*5: J-POWER head office building Note: Figures have been adjusted in accordance with the expansion/contraction of the range of data available for compilation.

#### **Fuel Consumption in Offices (Gasoline Equivalent)**

	Unit	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Consumption	kl	1,299	1,290	1,293	1,252	1,198	1,230

Note: Figures have been adjusted in accordance with the expansion/contraction of the range of data available for compilation.

#### **Rate of Procurement of Recycled Copy Paper**

		Unit	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Copy paper*6	Purchased	million sheets	58.77	61.50	61.79	58.53	55.30	54.81
Recycled copy paper*6	Purchased	million sheets	58.14	61.25	61.45	57.85	54.76	54.58
	Purchase rate	%	99	99	99	99	99	100

<sup>\*6:</sup> A4 paper-size equivalent

Notes: 1 Soot and dust emissions are calculated from monthly measurements.
2 Denominators for intensity represent the electricity generated in thermal power stations (excluding geothermal power stations).



The  $\bigstar$  marks denote data that are the subjects of third-party assurance. (Please refer to page 45.)

#### **Business Activities and the Environment**

The charts below detail the resource consumption and environmental load of the fiscal 2016 J-POWER Group operations within Japan.

Note: The scope of applicability includes J-POWER and its 27 consolidated domestic subsidiaries, which are engaged in electric power business, electric power related business, and other business. The amounts attributed to consolidated subsidiaries are based on percentages corresponding to J-POWER's equity share.

#### **INPUT**

#### **Thermal Power Generation**

• Fuel ★	
Coal (wet)	20.40 million tons
Heavy oil	44 thousand kl
Light oil	23 thousand kl
Natural gas	160.1 million Nm <sup>3</sup>
Biomass	21 thousand tons
• Industrial-use water 🛨	10.87 million m <sup>3</sup>
• Major Chemicals (undiluted equivale	nts)
Limestone (CaCO <sub>3</sub> )	207 thousand tons
Ammonia (NH <sub>3</sub> )	13 thousand tons
Hydroelectric power	
Power for pumped storage	0.9 TWh
<b>Geothermal Power</b>	

#### Internal Use at Business Sites and Offices

• Electricity (purchased) * Business sites	
• Fuel (gasoline equivalent) Business sites	•
• Clean water Business sites	
Copy paper (A4 equivalent)	55 million sheets

Notes: 1. Other than discharged as wastewater, almost all industrial-use water used in thermal power stations is released into the atmosphere as steam.

- River water used in hydroelectric power stations is not included in the input figures, as all such water is returned to the river after power generation.
- 3. While steam is used in geothermal power stations, hot water is returned underground after power generation via an injection well.

#### **Business Activities**

Steam ......Hot water

### Electric Power Generated ★



62.2 TWh



0.41 million tons

2.33 million tons



Hydroelectric





Auxiliary power for operation and transmission loss

#### **Major Resources Recycled**

Coal ash 🛨	1,708 thousand tons	(99.4%)
Sludge (excluding gypsum)	11 thousand tons	(56.3%)
Gypsum (desulfur- ization byproduct)	310 thousand tons	(100.0%)
Sulfuric acid (desulfurization byproduct)	22 thousand tons	(100.0%)
Other industrial waste	36 thousand tons	(76.2%)
Waste paper		(94.1%)
Driftwood into dam reservoirs	18 thousand m³	(67.6%)

Note: Percentages indicate recycling rate.



Effective Utilization (at cement plants, etc.)

.. 4.2 thousand m<sup>3</sup>

#### **OUTPUT**

#### Thermal Power Stations \*

Electric Power Sales \*

Thermal rower stations	
Emissions into the Atmosphere	
CO <sub>2</sub>	
SO <i>x</i>	10 thousand tons
NOx	28 thousand tons
Soot and dust	1 thousand tons
Emissions into Bodies of Water	
Wastewater	3.72 million m <sup>3</sup>
Wastewater COD	14 tons
<b>Geothermal Power Station</b>	
Hot water	2.45 million tons

# CO₂ Emissions from Business-Site and Office Activities ★

Driftwood into dam reservoirs ....

Business sites     Offices	
Waste ★	

Industrial waste	
Coal ash	11 thousand tons
Other	20 thousand tons
• Specially controlled industrial waste	0.2 thousand tons
Non-industrial waste	
Waste naner	20 tons

#### **Third-Party Assurance Regarding Environment-Related Information**

The environmental information and performance data (hereinafter "sustainability information") contained in this J-POWER Group Annual Report 2017 have been reviewed by Ernst & Young ShinNihon LLC, from the point of view of accuracy and comprehensiveness for important sustainability information which is determined by the Japanese Association of Assurance Organizations for Sustainability Information (J-SUS). As a result

of this review, we have received the Independent Assurance Report. The data which were calculated in accordance with the calculation standards\* and became the subjects of the assurance are indicated by stars (\*).

\* Calculation standards are available on the J-POWER Group website: http://www.jpower.co.jp/english/ir/ir51000.html

#### Translation



The following is an English translation of an independent assurance report prepared in Japanese and is for information and reference purposes only. In the event of a discrepancy between the Japanese and English versions, the Japanese version will prevail.

August 1, 2017

#### Independent Assurance Report

TO: Mr. Toshifumi Watanabe President Electric Power Development Co., Ltd.

Kenji Sawami Executive Officer Ernst & Young ShinNihon LLC Tokyo

We, Ernst & Young ShinNihon LLC, have been commissioned by Electric Power Development Co., Ltd. (hereafter the "Company") and have carried out a limited assurance engagement on the Key Environmental Performance Indicators (hereafter the "Indicators") of the Company and its major subsidiaries for the year ended March 31, 2017 as included in J-POWER Group Annual Report 2017 (hereafter the "Report"). The scope of our assurance procedures was limited to the Indicators marked with the symbol "\*" in the Report.

#### 1. The Company's Responsibilities

The Company is responsible for preparing the Indicators in accordance with the Company's own criteria, which it determined with consideration of Japanese environmental regulations as presented in the Investor Relations, IR Library, Annual Reports (<a href="http://www.jpower.cojp/englishi/ir/ir51000.html">http://www.jpower.cojp/englishi/ir/ir51000.html</a>) of the Company's website. Greenhouse gas (GHG) emissions are estimated using emissions factors, which are subject to scientific and estimation uncertainties, given instruments for measuring GHG emissions may vary in characteristics, in terms of functions and assumed parameters.

#### 2. Our Independence and Quality Control

We have met the independence requirements of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants in March 2013, which is based on the fundamental principles of integrity, objectiveness, professional competence and due care, confidentiality, and professional behavior.

In addition, we maintain a comprehensive quality control system, including documented policies and procedures for compliance with ethical rules, professional standards, and applicable laws and regulations in accordance with the International Standard on Quality Control 1 issued by the International Auditing and Assurance Standards Board in April 2009.

#### 3. Our responsibilities

Our responsibility is to express a limited assurance conclusion on the Indicators included in the Report based on the procedures we have performed and the evidence we have obtained.

We conducted our limited assurance engagement in accordance with the International Standard on Assurance Engagements: Assurance Engagements Other than Audits or Reviews of Historical Financial Information - ("ISAE 3000") (Revised), issued by the International Auditing and Assurance Standards Board in December 2013, Practical Guidelines for the Assurance of Sustainability Information, revised in December 2014 by the Japanese Association of Assurance Organizations for Sustainability Information and, with respect of GHG emissions, Assurance Engagements on Greenhouse Gas Statements ("ISAE 3410"), issued by the International Auditing and Assurance Standards Board in June 2012. The procedures, which we have been performed according to our professional judgment, include inquiries, document inspection, analytical procedures, reconciliation between source documents and Indicators in the Report, as well as the following:

- Making inquiries regarding the Company's own criteria that it determined with consideration of Japanese environmental regulations, and evaluating the appropriateness thereof;
- Inspecting relevant documents with regard to the design of the Company's internal controls related to the Indicators, and inquiring of personnel responsible thereof at the headquarters and one power station visited;
- · Performing analytical procedures concerning the Indicators at the headquarters and one power station visited; and
- Testing, on a sample basis, underlying source information and conducting relevant re-calculations at the headquarters and one power station visited.

The procedures performed in a limited assurance engagement are more limited in nature, timing and extent than a reasonable assurance engagement. As a result, the level of assurance obtained in a limited assurance engagement is lower than would have been obtained if we had performed a reasonable assurance engagement.

#### 4. Conclusion

Based on the procedures performed and evidence obtained, nothing has come to our attention that causes us to believe that the Indicators included in the Report have not been measured and reported in accordance with the Company's own criteria that it determined with consideration of Japanese environmental regulations.

Independent third-party assurance for J-POWER Group Annual Report 2017



#### **Respect for Human Resources**

The J-POWER Group considers each employee to be a valuable human resource that enables its sustainable growth as a corporation. We strive to provide safe and comfortable working environments, and, at the same time, we endeavor to create a corporate culture that respects the character and individuality of our employees and makes them feel it worthwhile to constantly take on new challenges.

The J-POWER Group positions recruitment, making use and development of human resources as crucial measures for its sustainable growth. We are reinforcing the foundation for career development, with a focus on the CDP (Career Development Program), and establishing workplace environments and systems that make advantageous use of diversity, in order to improve individual skills and workforce productivity.

#### **Recruiting and Making Use of Human Resources**

# The J-POWER Group's Conceptual Approach to Human Resource Recruitment

The J-POWER Group approach is realizing stable recruiting in the interest of sustainable growth, seeking human resources from people in a wide range of fields and age-groups, and providing employees with opportunities to take an active part. When recruiting and making use of human resources, we make sure that we comply with the labor regulations of Japan and other countries in which we conduct business. In addition, we are also conducting awareness raising in human rights training in accordance with J-POWER's Compliance Action Guidelines which stipulate respect for individuality and human rights and prohibition against discrimination. (Please refer to page 59.) We are engaged in creating systems and working environments that enable our diverse personnel to fully demonstrate their capabilities, without regard for gender, age, or other such distinctions.

#### **Number of New Graduates Employed (J-POWER)**

	FY2015	FY2016	FY2017
Male	60	66	72
Female	2	3	9
Total	62	69	81

#### Status of Human Resource Establishment (J-POWER)

Average length of continuous service	20.0 years (as of March 31, 2017)
Turnover rates for three years after joining	1.6% (April 2016)

#### **Measures to Promote Diversity**

As a measure to further make use of elderly people, we have an employment extension system which allows those who have passed retirement age and desire extension of employment to continue working until the age of 65. In combination with the personnel registration system (available up to age of 70), which introduces job opportunities in the Group, we will harness the experience, skills, and motivation to work possessed by elderly people in the Group for the sustained growth of our business. As of the end of March 2017, 128 employees (J-POWER) continue to work using the employment extension system.

Our employment rate for persons with disabilities was 2.10% as of June 1, 2017, which exceeds the statutory rate. We are enhancing working environments and promoting understanding of other employees through such initiatives as establishing "the consultation desk for employees with disabilities on assistance and working environments" and making office buildings barrier-free. We will continue making efforts to raise the employment ratio.

We will also take steps to improve our management training with a view to building a workplace where diverse human resources can take active part.

#### Protection of Employees' Rights

In accordance with the laws and regulations of each country in which we operate, the J-POWER Group protects the basic rights of its employees, including the prevention of child labor and forced labor, protection of the right to freedom of association, protection of the right of collective bargaining, and compliance with minimum wages. The Group also places a thorough prohibition on discrimination in all its forms, including on the grounds of birth, nationality, race, creed, religion, gender, physical condition, and social status.

In addition, in order to protect the rights of employees and to maintain and improve their living standards, we obligate employees who are not in management positions to join labor unions. In addition to consulting with the labor unions on important changes in working conditions, including salaries and bonuses, we hold consultations on management policy with labor unions once a year in order to reflect the opinions of employees in management policy.

#### Internships

J-POWER, JPHYTEC Co., Ltd., and JPec Co., Ltd. offer summer internships to science students in graduate school, university, or technical college. The internships provide experience in certain operations at power stations and other facilities with the aim of helping the interns' studies and supporting them in making future occupation choices. In fiscal 2016, 54 interns from various areas of Japan took up the challenge of practical training in the maintenance and operation of electric power facilities.

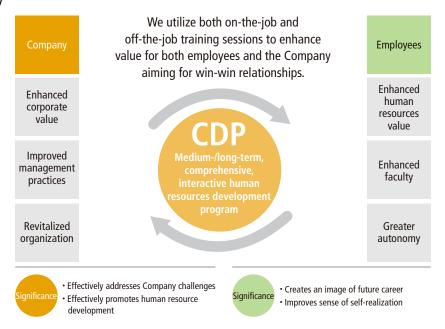
#### **Human Resource Development**

#### **Human Resource Development Programs**

Our aim in the J-POWER Group is to develop all our employees into independent, talented, professional human resources who contribute to the organization with a multiplicity of specialized

knowledge and a broad perspective. We are adopting the Career Development Program (CDP) as a measure to achieve that aim.

#### **CDP Overview**



#### **Evaluation and Management System**

We established an evaluation system in 2004 that is based on a goal management system. The system encourages employees to perform work autonomously, heighten their achievement motivation, and improve their faculty while working toward achieving their goals. We also set divisional goals to realize divisional strategies. Employees are encouraged to perform jointly to achieve the divisional goals.

#### **Various Training Programs**

The J-POWER Group provides various kinds of training programs as Off-JT, including level-specific training, career training, objective-specific training, divisional training, selective leadership training, and training at educational institutions\*. Through these programs, we are developing human resources in line with the CDP. We have also established training facilities for the technical functions (civil engineering and architectural engineering; hydroelectric power, transmission and transformation, and telecommunications; and thermal power) in order to systematically develop engineers.

The human resource development through such training programs aims for not only making our human resources acquire the basic knowledge and skills necessary for our business, but also fostering next-generation leaders, promoting diversity (enabling diverse human resources to perform actively), and empowering our veteran employees.

\* Training at educational institutions: Training program that sends employees to domestic or overseas business graduate schools or business schools, or offers them a chance to apply for studying abroad.

# Helping Employees Voluntarily Develop Their Careers and Abilities

J-POWER employs a self-declaration system where employees declare their career planning hopes to the Company once a year and discuss with their immediate superiors. We have also introduced a voluntary training incentive program and an academic training program to support employees developing their abilities on their own initiative.

#### **Developing Environments** to Create Dynamic Workplaces

#### **Toward Realization of a Work-Life Balance**

The J-POWER Group is actively developing working environments and cultures that enable every employee to autonomously enhance their work and personal life and focus on highly creative work. We are taking measures to help employees achieve a good work-life balance, including enhancement of and encouraging use of childcare and nursing care support programs, and normalizing working hours.

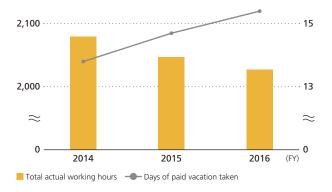
#### **Reduction of Working Hours**

As part of the work reforms at J-POWER, we have established an action program known as J-POWER Challenge 30 and set goals that we would reduce the number of overtime hours by 30% and increase the days of paid vacation taken by 30%, compared with fiscal 2016 actual levels, by the end of fiscal 2020. Measures to achieve these goals include a paid time leave system (scheduled for introduction in fiscal 2018), examining our operations, complete lights-out and a PC shutdown at Headquarters at 10 p.m. By achieving these goals, we will become "a company in which diversified human resources gather and can prove their merits according to their capabilities".

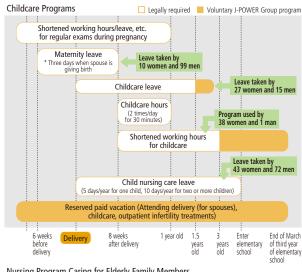
	FY 2016 Actual (A)	End of FY 2020 Target (B)	Difference (B)-(A)
Overtime hours	24.6 hr.s/month	17 hr.s/month	Approx. (8) hr.s/month
Days of paid vacation taken	15.4 days/year	20 days/year	Approx. 5 days/year

#### Changes in Total Actual Working Hours and Paid Vacation Taken (J-POWER)

(Hours)	(Days)
2,200 ·····	17



#### Overview of the Childcare and Nursing Care Support Programs and Results in Fiscal 2016 (J-POWER Group)



Nursing Program Caring for Elderly Family Members



#### "Platinum Kurumin" Special Certification Mark

Certified by the Minister for Health, Labour and Welfare as a supportive company for childcare, J-POWER received a "Kurumin" certification. We also received the special "Platinum Kurumin" mark certification, which is awarded only to companies with measures that have met an even higher standard. We will continue making improvements for an even better work environment so that all employees will be able to harmonize their work and their personal life, and exercise their abilities fully.



#### **Consultation Desk**

Aiming for building a work-friendly environment in the workplace, we have established a consultation desk where employees can discuss working hours, the workplace environment, sexual harassment, and power harassment. In order to prevent harassment, we have also developed Company regulations, manuals, and other such resources, and we are implementing education for increased awareness in level-specific training courses, posters, and other such measures. Our goal is a working environment where human rights and individuality are respected and where diverse personnel are completely at ease in going about their work.

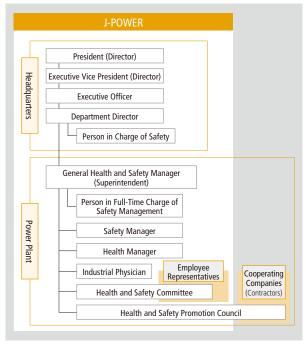
#### **Health and Safety Management**

The J-POWER Group intends to create safe, healthy, and rewarding workplaces as the foundation of our business activities. J-POWER and other Group companies each have roles and responsibilities and collaborate on implementing health and safety management to prevent occupational accidents and maintain and improve the health of our employees.

#### **Health and Safety Management System**

Based on laws and regulations, the J-POWER Group has established health and safety management systems, which include employee representatives and cooperating companies (contractors), at Headquarters and local operating units such as power plants.

#### **Health and Safety Management System**



Note: Since the safety management system differs depending on the work content and the number of employees, etc. of each operating unit, this diagram shows a representative system at the thermal power plant.

# Measures Pursuant to the Group Health and Safety Operation Plan

The J-POWER Group established a Group Health and Safety Operation Plan that organizes common issues that the Group companies need to address and sets subsequent priority topics. Based on the plan, individual Group companies formulate their own health and safety operation plans and take measures in cooperation with the Group.

#### **Safety Priorities**

- (1) Revitalizing communications through collaboration among personnel at worksites and offices
- (2) Prevention of repetitive-pattern accidents
- (3) Prevention of fatal accidents and other commuting-related accidents caused by traffic accidents

#### **Health Priorities**

- (1) Measures against lifestyle-related disease
- (2) Measures to promote mental health
- (3) Support for working in a healthy manner

The results from the implementation of health and safety operation plans are compiled at the end of the fiscal year and reported to the Executive Committee\*. The health and safety operation plans for the next fiscal year are drawn up on the basis of those results.

\* Executive Committee: Please refer to page 53.

# Initiatives for the Prevention of Occupational Accidents

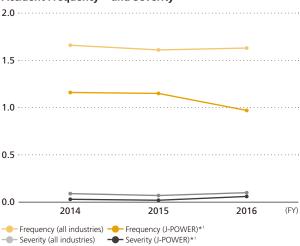
In recent years, many occupational accidents have occurred when contractors are engaged in construction and other works, and it is thus important to promote unified safety activities that include them. Consequently, we are taking measures to invigorate communications throughout the workplace and raise safety awareness. In addition, when we place an order for construction work with contractors, we give consideration to work methods, schedules, costs, etc., in order to enable them to work in healthy and safe environments. By implementing these measures, we prevent the occurrence of all types of occupational and traffic accidents, including repetitive-pattern accidents.

The number of occurrences and nature of occupational accidents as well as analyses by occurrence situation are reported to the Executive Committee on a quarterly basis.

#### Number of Occupational Accidents\*1

	FY2014	FY2015	FY2016
Fatal Accident	_	_	_
Serious Injury	9	8	7
Minor Injury	12	13	11

#### Accident Frequency\*2 and Severity\*3



- \*1 Accidents involving J-POWER employees and accidents involving contractors (principal contractors and subcontractors) engaging in construction and other works ordered by J-POWER
- \*2 Frequency: Number of casualties in occupational accidents per one million working hours. Covers accidents causing loss of one day or more of work. Does not include accidents of employees on loan.
- \*3 Severity: Number of days of work lost per 1,000 working hours. Does not include accidents of employees on loan.

#### **Health and Safety Training Programs**

J-POWER Headquarters implements safety training for Group companies at head offices and local operating units for the purpose of improving the health and safety levels of the entire J-POWER Group. In addition, local operating units themselves implement safety training suitable for their business operations, such as training for new hires and transferring employees required by regulations, special training for work involving electricity, and training for related laws and regulations. Management-level employees such as superintendents and the staff members in full-time charge of safety are made to participate in seminars and courses held by external organizations in order to improve their health and safety knowledge and management skills and to raise safety awareness. In fiscal 2016, 865 people participated in those training programs that were held by J-POWER Headquarters.

# **Health and Safety Management** with Regard to Radiation

J-POWER is currently proceeding with construction of the Ohma Nuclear Power Plant. Currently, construction work is still under way, and there is no danger of employees and workers being affected by radiation, but we will have established our health and safety management system related to radiation by the time that becomes necessary.

# Maintaining the Physical and Mental Health of Employees and Their Families

To maintain and improve the health of employees and their families, we make them have health checks and health maintenance guidance, and take infectious disease prevention measures. In addition, we place priority on the prevention of lifestyle-related disease and mental health disorders. Therefore, we are providing special health checks, designated health guidance, and health maintenance and improvement activities\*, as well as continuing the stress check programs. By taking these measures, we support good physical and mental health of employees and their families.

\* Health maintenance and improvement activities: Comprehensive activities which integrate activities aimed at total health, both physical and mental, based on Ministry of Health, Labour and Welfare guidelines on Total Health Promotion Plans (THP), and activities aimed at fostering a vibrant environment through the Company's unique communication revitalization initiative.

# Certified as "White 500" Health and Productivity Outstanding Company

J-POWER was recognized as a 2017 Certified Health and Productivity Outstanding Company, which practices excellent good health and productivity, under the large enterprise category (White 500) by the Ministry of Economy, Trade and Industry and the Nippon Kenko Kaigi (Japan health conference). We consider that this certification is based on assessments of our efforts in health activities that emphasize preventive measures against "lifestyle-related illness/metabolic syndrome" and "mental health disorders." We will work to increasingly promote the health of our employees in the years to come.



#### Basic Policy on Occupational Health and Safety

The Company aims to create safe, healthy, and rewarding workplaces for the J-POWER Group.

The Company and general directors of operating units fully play their part in establishing and operating a robust occupational health and safety management system with cooperation of employees and all concerned, and in remaining in compliance with laws and regulations, and self-defined rules. We also work to promote overall safety management and improve the health and safety standards of the J-POWER Group. Through taking these measures, we prevent occupational accidents, and maintain and promote health.

#### **Creating Rewarding Workplaces**

The Company works to create rewarding workplaces that enable each and every J-POWER Group employee to realize health and self-fulfillment by ensuring, maintaining, and improving workplaces that are safe and comfortable to work.

#### Compliance with Rules, Including Laws and Regulations

The Company complies with external and internal rules, including the relevant laws, regulations, and Company regulations, and endeavors to prevent occupational accidents as well as maintain and promote health in the J-POWER Group.

#### Improvement of Health and Safety Management

The Company and general directors of operating units establish and operate a systematic, efficient occupational health and safety management system through supervising safety managers, health managers, and those in charge of safety at the operating units, and gaining the cooperation of employees and all others concerned, and thus work to improve the level of health and safety in the J-POWER Group.

#### Responsibilities of Management

The Company and general directors of operating units recognize their responsibility for realization of this basic policy, and take the initiative and set an example for those that follow, as well as keep the relevant parties thoroughly informed of this basic policy.

When a situation arises that runs contrary to this aim, the Company and the general directors of operating units themselves will take the initiative to solve the problem while working for investigating the cause and preventing a recurrence, and clarify its root cause and take appropriate measures.

#### **Contribution to Society**

"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." Under this Corporate Philosophy, the J-POWER Group actively participates in social contribution activities and contributes to social development as a good corporate citizen. Our activities include support for culture and the arts, cooperation with local communities, support for participation in volunteer activities, and contributions to the international community.

Specifically, as we place community involvement and harmonizing energy supply with the environment as two main themes for our activities, we place high value on communicating with, sharing knowledge with, and learning with local community members and people working to harmonize energy supply with the environment. We are steadily engaging in activities on this basis as well as supporting the volunteer activities of our employees.

#### **Records of Social Contribution Activities**

For our social contribution activities in fiscal 2016, we implemented a variety of initiatives that included the following programs.

Program	Outline		Collaborative group	Number of participants, etc.
Eco×Ene Experience Tour (Hydro	electric Power Part)			
East No.	In collaboration with experts who can impart information on the natural environment, we organized hands-on study tours on which visitors experience the power station and nature with their five senses, notice the connection between energy and the environment that support people's livelihoods, and have a fun time while learning with each other.	Children from elementary schools with their parents	KEEP, Inc. (Public Interest Incorporated Foundation) Forum for Environmental Symbiosis in Shirakawa-Go (NPO)	63 family groups of parents and children

#### Stamp Counting Volunteer Experience Event



We organized volunteer experience events in support of an NGO that is active in trying to create a world without hunger. Opportunities to experience volunteer work such as counting and sorting unused stamps are provided in the events.

J-POWER Group Hunger Free World (NGO) Six times/year employees

#### Workplace Experience Learning for a Local Junior High School in Hyogo Prefecture



At Takasago Thermal Power Station, we accepted junior high school students for workplace experience learning during "Give It a Try Week." We incorporated a variety of business experiences so that the students gain a real sense of the varied kinds of work at the power station including jobs indirectly related to power generation.

Second-year students from Takasago Municipal Shoyo Junior High School

6

#### Coral Watching in Kochi Prefecture



We support an elementary school triathlon tournament held in the town of Nahari in the Nahari River basin, where we conduct hydroelectric power generation. In 2016, to enliven the event, we invited the children who took part to observe the coral living in the nearby sea. They benefited from the opportunity to think about the connection between the forest and the river that nurtures the sea through seeing the coral from a sightseeing boat.

Participants in the kids' triathlon (elementary school pupils)

60

#### **Support for Volunteer Activities**

To support employees' volunteer activities, we maintain an environment, including a volunteer leave of absence system, in which employees conduct volunteer activities.

#### **Respect for Human Rights**

Believing that it is important to respect human rights in our business activities, we incorporate human rights training in employee training programs, as well as provide human rights training in accordance with the needs of local business units.

# Governance

#### **Corporate Governance**

In accordance with its Corporate Philosophy, the Company endeavors to enhance corporate governance on an ongoing basis, in order to realize sustainable growth and enhance corporate value over the medium-to-long term.

The Company has established the Basic Policy on Corporate Governance as its basic approach and policy regarding corporate governance. For more information, please refer to the J-POWER Group website.

URL: http://www.jpower.co.jp/english/ir/ir23000.html

#### **Respect for Shareholder Rights**

The J-POWER Group believes that sustainable growth and enhancement of corporate value over the medium-to-long term can only be achieved in cooperation with a wide range of stakeholders. The Company respects shareholder rights in order to allow for proper collaboration with shareholders who are important stakeholders.

#### **Ensuring the Rights and Equality of Shareholders**

The Company's policy regarding shareholder rights, such as voting rights at the general meeting of shareholders, is to respect such rights, and ensure substantial equality. In addition, the Company gives consideration to ensuring the exercise of the special rights to listed companies and their officers that are also recognized for minority shareholders (including the right to seek an injunction against illegal activities, and the right to file a shareholder lawsuit).

#### **General Meetings of Shareholders**

The Company provides information that is regarded to contribute to appropriate decision making at general meetings of shareholders, through the improvement of the contents of convocation notices, reference materials, and business reports, as well as disclosure of financial results, timely disclosures, and posting on its website. as needed.

The Company sends a convocation notice for each ordinary general meeting of shareholders around three weeks ahead of the meeting date, to ensure that shareholders have sufficient time to consider the proposals for the meetings, and enable shareholders to appropriately exercise their voting rights. It also endeavors to disclose information included in the convocation notice online in both Japanese and English, prior to sending the notice. The Company also endeavors to avoid holding the general meeting of shareholders on days crowded with other companies' shareholder meetings.

The general meeting of shareholders for the fiscal year ended March 2017 was held on June 28, 2017, avoiding the day when many other companies hold their shareholder meetings. The content of the convocation notice was posted on the Company's website (in Japanese on May 22 and in English on May 30), and the notice sent to shareholders on June 1, a total of 12 days earlier than the legal deadline.

#### **Corporate Governance System**

J-POWER has adopted a Company with an Audit & Supervisory Board structure, and has put in place a system for mutual oversight among Directors through the meetings of the Board of Directors attended by Outside Directors who participate in the Company's management decision making from an independent position.

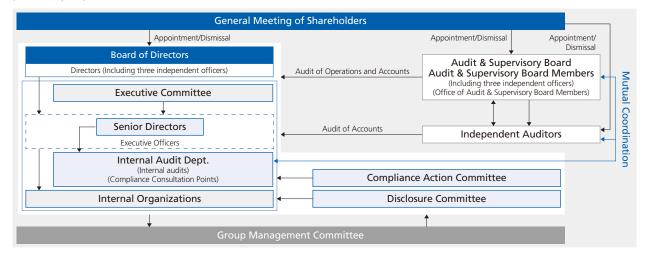
Further, the execution of duties by Directors is constantly monitored through the attendance at the meetings of the Board of

Directors and other management meetings by the Audit & Supervisory Board Members, including Outside Audit & Supervisory Board Members with abundant experience in such areas as the management of leading Japanese listed companies and execution of government policies. The Company believes this system allows for sufficient corporate governance function.

The Company has also established the Executive Committee in addition to structures prescribed by the Companies Act.

#### **Corporate Governance Structure**

(As of June 28, 2017)



#### Composition of the Board of Directors and the Audit & Supervisory Board

#### Composition of the Board of Directors

The Board of Directors is composed of Directors with abundant experience, distinguished knowledge, and advanced specialization, ensuring that a balance and diversity of knowledge, experience, and abilities is maintained as a whole. The number of Directors is 14 or less.

In addition, in order to ensure the effectiveness of independent and objective management supervision by the Board of Directors, the Company endeavors to appoint at least 2 Independent Outside Directors, considering their experience, knowledge, specialization, and

Currently, the total number of Directors is 14, including 3 Independent Outside Directors.

#### Composition of the Audit & Supervisory Board

The Audit & Supervisory Board comprises a maximum of 5 Audit & Supervisory Board Members, at least half of whom are Outside Audit & Supervisory Board Members. In addition, at least 1 person with appropriate knowledge of finance and accounting is appointed as an Audit & Supervisory Board Member.\*

Currently, the total number of the Audit & Supervisory Board Members is 5, including 3 Independent Outside Audit & Supervisory Board Members.

\* Senior Audit & Supervisory Board Member Hiroshi Fujioka (Independent Outside Audit & Supervisory Board Member) has a high level of knowledge in the area of finance and accounting as he has had long experience in the administration of fiscal and financial issues, etc.

#### System for the Execution of Directors' Duties

#### **Ensuring Effectiveness in Business Execution**

The Board of Directors meets monthly in principle\*1 and on an as-needed basis, with attendance by all Directors and Audit & Supervisory Board Members, including Outside Directors and Outside Audit & Supervisory Board Members. The Executive Committee meets weekly in principle, with attendance by all Senior Directors\*2, Executive Managing Officers, and full-time Audit & Supervisory Board Members. This committee discusses matters subject to deliberation by the Board of Directors, significant company-wide matters related to business execution by the President and Executive Vice Presidents based on policies decided by the Board of Directors, and important matters related to individual business execution.

In addition to allocating functions for the Board of Directors and Executive Committee, the Company has established a system in which Senior Directors and Executive Officers share responsibility for business execution. This system clarifies responsibilities and authority, enables appropriate and prompt decision making, and provides for efficient corporate management.

- \*1 The Board of Directors met 12 times during fiscal 2016.
- \*2 Senior Directors: Chairman, President, and Executive Vice Presidents

#### **Ensuring Appropriateness in Business Execution**

The Company has established the Internal Audit Department to ensure proper business execution, which conducts internal audits from a perspective that is independent of other operating units. In addition, each operating unit regularly conducts self-audits of its own business execution.

#### **Preventing Conflicts of Interest**

The Directors of the Company, in accordance with its Corporate Philosophy, Corporate Conduct Rules, and Compliance Action Guidelines\*1, exemplify honest and fair conduct based on a spirit of compliance and business ethics. In addition, the Company works to prevent conflicts of interest in the event that the Company engages in a transaction with one of its Directors, etc., \*2 by obtaining the approval of the Board of Directors before the transaction, and reports the results to the Board of Directors.

- \*1 Please refer to page 58 for further information on the Corporate Conduct Rules
- and Compliance Action Guidelines. \*2 Directors or major shareholders (shareholders with shares representing 10% or more of the voting rights in the Company)

#### Audits by Audit & Supervisory Board Members

In accordance with the Companies Act, J-POWER appoints Audit & Supervisory Board Members, who audit the legality and appropriateness of Directors' business execution. At J-POWER's Headquarters, Audit & Supervisory Board Members conduct audits by attending the meetings of the Board of Directors and other important meetings and observing the status of the execution of Directors' and Executive Officers' duties. In addition, the Audit & Supervisory Board Members perform site visits to local operating units and subsidiaries in Japan and overseas.

In the course of accounting audits, Audit & Supervisory Board Members liaise with the Independent Auditors to regularly receive reports and exchange opinions regarding auditing schedules and results as a means of ensuring consistency with the Independent Auditors' auditing methods and results.

When performing audits, Audit & Supervisory Board Members liaise with the Internal Audit Department.

With regard to staff under the Audit & Supervisory Board Members, the Company has established the Office of Audit & Supervisory Board Members as an independent unit outside of the Directors' chain of command. The office's full-time specialist staff assist the Audit & Supervisory Board Members in the course of their audits.

#### **Group Governance**

With regard to the administration of subsidiaries and affiliates, the J-POWER Group's basic policy calls for Group-wide business development in accordance with the Group's management plan. The administration of subsidiaries and affiliates is undertaken in accordance with the Company's internal regulations, and the Group Management Committee works to improve the appropriateness of operations for the entire corporate Group. In addition, the Audit & Supervisory Board Members and the Internal Audit Department implement audits of subsidiaries and affiliates with the objective of ensuring proper operations at all Group companies.

#### **Evaluation of Effectiveness of the Board of Directors**

The Company annually analyzes and evaluates the effectiveness of the Board of Directors to improve its effectiveness, as well as to realize sustainable growth and enhance corporate value over the medium-to-long term.

Regarding the evaluation in 2017, the Board of Directors discussed the matter based on the status of measures implemented based on the previous year's analysis and evaluation, and interviews conducted mainly with Outside Directors and Outside Audit & Supervisory Board Members, and the chairs of the Board of Directors and Audit & Supervisory Board. As a result of the discussion, the Company determined the effectiveness of the Board of Directors to be sufficient. Going forward, the Company will further expand the scope of deliberation based on changes in the business environment, and make continual efforts to enhance the effectiveness of the Board of Directors.

#### Directors, Audit & Supervisory Board Members, and Executive Officers (As of June 28, 2017)



Representative Director Masayoshi Kitamura Company-wide compliance



Representative Director Toshifumi Watanabe



Representative Director Executive Vice President Hitoshi Murayama Production/technology oversight



Representative Director Executive Vice President Masato Uchiyama Development/sales oversight/international business Department Director of Energy Business (delegation of adminis-trative works)



Representative Director Executive Vice President Shuji Etoh

Corporate oversight Department Deputy Director of Nuclear Power Business (delega-tion of administrative works)



Representative Director Executive Vice President

Akihito Urashima Nuclear power oversight Department Director of Nuclear Power Business (delegation of administrative works)



Director, Executive Managing Officer Yoshiki Onoi

International Business Management Dept. International Business Development Dept. Department Director of International Business (delegation of administrative works)



Director, Executive Managing Officer

Hiromi Minaminosono Secretarial Affairs & Public Relation Dept. Personnel & Employee Relations Dept. Energy Planning Dept. Power Business Planning & Development Dept. Nuclear Power Management Dept. Department Deputy Director of Energy Business (delegation of administrative works)

Department Deputy Director of Nuclear Power Business (delegation of administrative works)



Director, Executive Managing Officer

Hiroyasu Sugiyama Civil & Architectural Engineering Dept.

Thermal Power Engineering Business, International Business, and Environment & Energy Business (matters under special assignment)

Department Deputy Director of Nuclear Power Business (delegation of administrative works)



Director, Executive Managing Officer Hideki Tsukuda Thermal Power Dept. Thermal Power Engineering Dept.

Research & Development Dept.

International business (matters under special assignment)

Director, Executive Managing Officer Makoto Honda Accounting & Finance Dept. Procurement Dept. International Business

Management Dept. Corporate planning & administration (matters under special assign-Department Deputy Director of International Business (delegation of administrative works)



Go Kajitani\*1,3



Director Tomonori Ito\*1,3



John Buchanan\*1,3

Senior Audit & Supervisory **Board Members** 

Audit & Supervisory Board Members

> Shosaku Kusunose Yoshikazu Shimada Ryou Suzuki

**Executive Managing Officers** 

Hisanori Shizuma Hiroshi Sasatsu Hitoshi Kanno

Isshu Kurata

Naori Fukuda Hiroshi Fujioka\*2,3

Shinichi Kawatani Mutsutake Otsuka\*2,3 Kiyoshi Nakanishi\*2,3

Katsunori Hoshi

**Executive Officers** 

Masaaki Ikeda

- \*1 Outside Director
- \*2 Outside Audit & Supervisory Board Member \*3 Independent Officer

#### **Outside Officers**

The Company's Outside Directors and Outside Audit & Supervisory Board Members are independent officers that meet both the requirements for independent officers prescribed by the Tokyo Stock Exchange, and the Criteria to Determine the Independence of Outside Officers prescribed by the Company.

#### Criteria to Determine the Independence of Outside Officers

Outside Officers must not fall under any of the following items:

- Persons whose major business partner\*
   is the Company or the Company's subsidiaries, or persons executing business for such persons.
- Persons who are major business partners\*1 of the Company or the Company's subsidiaries, or persons executing business for such persons.
- 3. Consultants, accounting professionals, and legal professionals who have received large amounts of money\* and/or other properties other than officers' remuneration from the Company or the Company's subsidiaries. (If the persons that have received such properties are corporations, general partnerships, or other organizations, this means persons that belong to such organizations.)
- 4. Persons who fall under any of (1) to (3) below during the past 10 years:
  - (1) Persons listed in paragraphs 1 to 3 above;
  - (2) Persons who execute business, or Directors who do not execute business of the Company or the Company's subsidiaries; or
  - (3) Audit & Supervisory Board Members of the Company or the Company's subsidiaries.

- 5. Persons who are close relatives of any of the persons listed in (1) to (4) below (excluding immaterial persons):
  - (1) Persons listed in paragraphs 1 to 4 above;
  - (2) Persons who execute business, or Directors who do not execute business of the Company or the Company's subsidiaries;
  - (3) Audit & Supervisory Board Members of the Company or the Company's subsidiaries; or
  - (4) Persons who fall under (2) or (3) above during the past 10 years.
- \*1 "Major business partners" refer to business partners whose annual amount of transactions with the Company during the past three fiscal years accounted for over 2% of the total consolidated sales of the Company or that of the other party.
- \*2 "Large amounts of money" refers to 10 million yen or more a year, on average during the past three fiscal years.

#### Independent Outside Directors (As of June 28, 2017)

#### Go Kajitani (b. November 22, 1936)

Career summary

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Registered as an attorney at law (Dai-ichi Tokyo Bar Association) Joined KAJITANI LAW OFFICES
President of Dai-ichi Tokyo Bar Association, Vice President of Japan Federation of Bar Associations
Senior Partner of KAJITANI LAW OFFICES
Outside Audit & Supervisory Board Member of NICHIAS Corporation
President of Japan Federation of Bar Associations
Chairman of the Central Third-Party Committee to Check Pension Records, the Ministry of Internal Affairs and Communications
Director (Outside Director) of the Company (current position)
President of Japan Legal Support Center
Outside Audit & Supervisory Board Member of The Yokohama Rubber Company, Limited

#### Reason for selection

He has distinguished knowledge as an attorney at law and abundant experience in the legal profession. He also has experience to serve as an Outside Audit & Supervisory Board Member of other companies.

#### Main activities during fiscal 2016

He attended 12 of the 12 meetings of the Board of Directors and made comments primarily based on his distinguished knowledge and a wide range of experience as an attorney at law.

#### Tomonori Ito (b. January 9, 1957)

Career summary		
April 1979	Joined The Bank of Tokyo, Ltd.	
March 1990	Vice President of Investment Banking Group, Bank of Tokyo Trust Company, New York Branch	
April 1994	Vice President of Emerging Market Group, The Bank of Tokyo, Ltd., New York Branch	
March 1995	Manager of Business Development Daini, Union Bank of Switzerland, Tokyo Branch	
August 1997	General Manager of Tokyo Branch and Head of Investment Banking, Union Bank of Switzerland	
June 1998	Head of Investment Banking and Managing Director, UBS Securities Japan Co., Ltd.	
April 2011	Visiting Professor of Graduate School of International Corporate Strategy, Hitotsubashi University	
May 2012	External Director of PARCO CO., LTD. (current position)	
October 2012	Professor of Graduate School of International Corporate Strategy, Hitotsubashi University (current position)	

Outside Director of Aozora Bank, Ltd. (current position)

Director (Outside Director) of the Company (current position)

#### Reason for selection

He has abundant experience in investment banking business both inside and outside Japan, and also has distinguished knowledge acquired through researches in financial theory as Professor of Graduate School of International Corporate Strategy at Hitotsubashi University.

#### Main activities during fiscal 2016

He attended 9 of the 10 meetings of the Board of Directors after assuming his current position as of June 22, 2016, and made comments primarily based on his distinguished knowledge and a wide range of experience acquired through abundant experience in investment banking business both inside and outside Japan, and research in financial theory.

#### John Buchanan (b. October 31, 1951)

#### Career summary

June 2014

June 2016

October 1974	Joined Lloyds Bank Group (Bank of London and South America, Lloyds Bank International, Lloyds Merchant Bank)
January 1981	Representative, subsequently Branch Manager, Lloyds Bank International,
	Osaka
August 1983	Branch Manager, Bank of London and South America, Barcelona
October 1987	Joined S.G. Warburg & Co. Ltd.
October 1992	Director of S.G. Warburg & Co. Ltd.
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October 1995 Joined The Sumitomo Bank, Limited, London Branch
May 2000 Joined Daiwa Securities SB Capital Markets Europe Limited
August 2006 Research Associate of Centre for Business Research, University of
Cambridge (current position)

June 2016 Director (Outside Director) of the Company (current position)

#### Reason for selection

He has abundant experience in investment advisory business both inside and outside Japan, and also has distinguished knowledge acquired through research concerning corporate governance at the University of Cambridge.

#### Main activities during fiscal 2016

He attended 10 of the 10 meetings of the Board of Directors after assuming his current position as of June 22, 2016, and made comments primarily based on his distinguished knowledge and a wide range of experience acquired through abundant experience in investment advisory business both inside and outside Japan, and research concerning corporate governance.



#### Independent Outside Audit & Supervisory Board Members (As of June 28, 2017)

#### Hiroshi Fujioka (b. June 2, 1954)

Career summary		
April 1977	Joined the Ministry of Finance	
July 2008	Director-General of Customs and Tariff Bureau, the Ministry of Finance	
July 2009	Director-General for Policy Planning, the Ministry of Land, Infrastructure, Transport and Tourism	
January 2012	Senior Executive Vice President of Japan Housing Finance Agency (Incorporated Administrative Agency)	
January 2014	Councilor of the Minister's Secretariat, the Ministry of Finance	
June 2014	Audit & Supervisory Board Member (Outside Audit & Supervisory Board Member) of the Company	
June 2015	Senior Audit & Supervisory Board Member (Outside Audit & Supervisory Board Member) of the Company (current position)	
June 2016	Outside Corporate Auditor of the Nishi-Nippon City Bank, Ltd.	

October 2016 Audit Committee Member (Outside Director) of the Nishi-Nippon City Bank, Ltd. (current position)

#### Reason for selection

He has distinguished knowledge and abundant experience acquired through working in the administration for a long time, and can be expected to enhance the Company's management oversight system.

#### Main activities during fiscal 2016

He attended 12 of the 12 meetings of the Board of Directors and 12 of the 12 meetings of the Audit & Supervisory Board, and made comments primarily based on his distinguished knowledge and a wide range of experience in the administration of fiscal and financial issues, etc.

#### Mutsutake Otsuka (b. January 5, 1943)

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Career sumi	mary
April 1965	Joined Japanese National Railways
April 1987	Joined East Japan Railway Company, General Manager of Finance Department
June 1990	Director and General Manager of Personnel Department of East Japan Railway Company
June 1992	Executive Director and General Manager of Personnel Department of East Japan Railway Company
June 1997	Executive Vice President and Representative Director and Director General of Corporate Planning Headquarters of East Japan Railway Company
June 2000	President and Representative Director of East Japan Railway Company
April 2006	Chairman and Director of East Japan Railway Company
April 2007	Temporary Audit & Supervisory Board Member (Outside Audit & Supervisory Board Member) of the Company
June 2007	Audit & Supervisory Board Member (Outside Audit & Supervisory Board Member) of the Company (current position)

May 2011	Vice Chairman of Nippon Keidanren
April 2012	Advisor of East Japan Railway Company (current position)
June 2013	Outside Director of JX Holdings, Inc. (currently JXTG Holdings, Inc.) (current position)
June 2014	Outside Director of NIPPON STEEL & SUMITOMO METAL CORPORATION (current position)

#### Reason for selection

He has distinguished knowledge and abundant experience as a director of a listed company, and can be expected to contribute to observe the Company's management intensively.

#### Main activities during fiscal 2016

He attended 12 of the 12 meetings of the Board of Directors and 12 of the 12 meetings of the Audit & Supervisory Board and made comments primarily based on his distinguished knowledge and a wide range of experience in the management of a listed company.

#### Kiyoshi Nakanishi (b. April 2, 1945)

Career summary		
April 1970	Joined Toyota Motor Co., Ltd.	
January 1997	General Manager of No. 3 Engine Technical Department of No. 4 Development Center of TOYOTA MOTOR CORPORATION	
June 2000	Director of TOYOTA MOTOR CORPORATION	
June 2003	Managing Officer of TOYOTA MOTOR CORPORATION	
June 2004	Adviser of TOYOTA MOTOR CORPORATION	
June 2004	Representative Director of GENESIS RESEARCH INSTITUTE, INC.	
June 2010	Adviser of GENESIS RESEARCH INSTITUTE, INC. (current position)	
June 2010	Adviser of Toyota Central R&D Labs, Inc.	
June 2010	Audit & Supervisory Board Member of TOYOTA TECHNOCRAFT Co., LTD. (current position)	
June 2011	Audit & Supervisory Board Member (Outside Audit & Supervisory Board Member) of the Company (current position)	

#### Reason for selection

He has distinguished knowledge and abundant experience as a director of a listed company, and can be expected to contribute to observe the Company's management intensively

#### Main activities during fiscal 2016

He attended 12 of the 12 meetings of the Board of Directors and 12 of the 12 meetings of the Audit & Supervisory Board and made comments primarily based on his distinguished knowledge and a wide range of experience in the management of a listed company.

# **Directors' and Audit & Supervisory Board Members' Remuneration**

By resolution at the 54th Ordinary General Meeting of Shareholders held on June 28, 2006, total remuneration for Directors was capped at ¥625 million annually (a fixed monthly salary calculated according to position and a performance-linked bonus paid once a year. Employee salaries for Directors who serve in dual capacity as employees are excluded). Directors' remuneration is determined, within the cap prescribed above, by means of discussion at meetings of the Board of Directors, after comprehensively taking into account corporate performances, his or her position, and other factors, in the light of the characteristics of the Company's business, namely, aiming to recover investment through the long-term operation of power plants, etc.

Total remuneration for Audit & Supervisory Board Members was capped at ¥120 million annually (a fixed monthly salary calculated according to position) at the same general meeting of shareholders. Audit & Supervisory Board Members' remuneration is determined, within the cap prescribed above, by means of consultation among Audit & Supervisory Board Members.

#### **Remuneration Paid during Fiscal 2016**

Category	Number of Persons	Total Amount
Directors (Outside Directors)	16 (3)	¥438 million (¥24 million)
Audit & Supervisory Board Members (Outside Audit & Supervisory Board Members)	6 (3)	¥111 million (¥44 million)
Total	22	¥550 million

Notes: 1. The Directors' remuneration includes a performance-linked bonus of ¥49 million for fiscal 2016.

The number of Directors and the number of Audit & Supervisory Board Members include two Directors and one Audit & Supervisory Board Member, respectively, who retired from office at the end of the 64th Ordinary General Meeting of Shareholders held on June 22, 2016.

#### Remuneration to Independent Auditors

Total remuneration paid during fiscal 2016 by the Company and its consolidated subsidiaries to the Independent Auditors who conducted accounting audits of the J-POWER Group comprised ¥140 million for auditing procedures and ¥32 million for non-auditing functions.

#### **Compliance & Risk Management**

J-POWER, in accordance with its Corporate Philosophy, has established the Corporate Conduct Rules (please refer to page 58) as the central core for compliance activities, outlining the basic rules for behavior in line with the spirit of compliance and business ethics to be observed in the course of business operations. In addition, the Company has established its Compliance Action Guidelines (please refer to page 58) as the criteria for determining specific actions by individual employees, including members of management, when conducting business activities. The Company distributes these documents to all employees, and works to encourage the awareness of compliance by having employees sign and keep with them a copy of the Compliance Pledge.

Directors adhere to the Corporate Philosophy, Corporate Conduct Rules, and Compliance Action Guidelines, set an example for honest and fair conduct based on a steadfast spirit of compliance and business ethics, and instill these values in employees.

In addition to these compliance measures, the Company incorporates mutual checks and balances in the internal decision-making process, undertakes reviews in various meetings and committees, and always maintains risk management frameworks in accordance with Company regulations. This structure ensures measures are implemented to recognize and avoid risks in the conduct of business activities, and minimizes the impact from losses when risks occur.

#### **Compliance Promotion Structure**

The Company's compliance is overseen by the Chairman, with an Executive Vice President or an Executive Officer in charge of compliance who implements compliance promotion programs and assists the Chairman and President. The Compliance Action Committee, chaired by the Chairman, has been established to discuss company-wide compliance promotion measures, evaluate their implementation status, and address issues related to compliance violations. With the participation of group companies, the committee is implementing measures for the entire J-POWER Group. Two task forces, led by two Executive Vice Presidents, have also been established to quickly and accurately promote operations pertaining to compliance promotion, one for company-wide compliance promotion and the other for autonomous safety activities based on the Company's safety regulations.

At major business units such as regional headquarters, regional transmission system & telecommunications centers, and thermal power plants, local compliance committees have been established to implement compliance activities suited to the special characteristics of the business units.

#### **Compliance Promotion Activities**

The Compliance Action Committee utilizes a PDCA (plan-do-check-act) method for compliance promotion, formulating a plan for each fiscal year, evaluating the results at the end of the fiscal year, and formulating the next year's plan based on the results. The compliance promotion plan and results are reported to the Board of Directors.

To raise compliance awareness among employees, the Company issues notifications of changes in laws and regulations, presents compliance-related case studies, and conducts training sessions on laws and regulations related to our business and on compliance issues.

When alleged compliance violations occur, the Compliance Action Committee investigates the facts and causes surrounding the issues, and takes appropriate action as necessary, including issuing directives for improvement, or measures to prevent a reoccurrence.

#### The J-POWER Group's Compliance Promotion System



#### Compliance Consultation Points (Whistle-blowing system)

The J-POWER Group has established Compliance Consultation Points at the Internal Audit Department and at an external law firm to serve as a consulting hotline in the event that employees face compliance issues, and makes employees aware of these channels. The employees who are seeking or have attended a consultation are rigorously protected.

#### The J-POWER Group's Compliance Consultation Points





#### **Barring Relations with Anti-Social Forces**

The J-POWER Group's policy is not to maintain relations of any sort with the anti-social forces that threaten the order and safety of civil society. The Company has determined the internal department to act as a point of contact in the event that demands or other contacts are received from anti-social forces, and has established a system that ensures quick collection of information and appropriate response in cooperation with specialist external agencies.

#### **Preventing Bribery and Corruption**

The J-POWER Group prohibits bribes, illicit payments, and illegal political donations, as well as entertaining or gifts to public officials that conflict with the National Public Service Ethics Act or rules prescribed by government agencies. Also, the Company does not offer financial or other rewards to foreign government officials in return for illicit benefits or incentives. We are careful to avoid actions that might be construed as collusion with politicians or administrative agencies, and strives to establish sound and transparent relationships.

#### Disclosure

The Company has established the Disclosure Committee, chaired by the President, to enhance transparency and accountability in corporate activities. This committee ensures fair and transparent disclosure of company information in a timely and proactive manner.

#### **Compliance with the Internal Control Reporting System**

In response to the internal control reporting system for financial reporting required by Japan's Financial Instruments and Exchange Act, the J-POWER Group established, maintains, and evaluates its internal control system centered on the Accounting & Finance Department and Internal Audit Department.

In fiscal 2016, continuing from the previous year, the Company's management evaluated the status of the development and operation of internal controls with respect to company-wide internal controls, operational process-related internal controls, and information technology-based internal controls in accordance with the implementation standards of Japan's Financial Services Agency. The Company determined that its internal control system for financial reporting is effective. This evaluation result was submitted as an *Internal Control Report* to the Director-General of the Kanto Finance Bureau in June 2017, following an audit carried out by the Company's Independent Auditor.

Going forward, the J-POWER Group will continue to verify the efficacy of its internal control system, and ensure the reliability of its financial reporting.

#### Corporate Conduct Rules (Revised on April 1, 2004)

#### Reliable supply of energy

We will put forth every effort to reliably supply energy both in Japan and abroad utilizing our experienced personnel and cutting-edge technology.

#### Safety assurance

In conducting operations, we will constantly work to raise safety awareness and give the highest priority to public and worker safety.

#### **Environmental conservation**

Based on an awareness that our business operations are deeply linked with the environment, we will actively engage in environmental conservation activities.

#### Communication with society

To establish communication with society, we will conduct information disclosure and public relations activities in a fair and transparent manner.

#### Contribution to society

Aiming to be a good corporate citizen, we will undertake activities to contribute to society and assist in the development of local communities both in Japan and abroad.

#### Creation of a rewarding corporate culture

In addition to providing safe and comfortable work environments, we will respect the individuality of our employees and endeavor to establish a rewarding corporate culture that encourages them to take on new challenges.

#### Compliance with laws, regulations, and corporate ethics

We will conduct business in good faith and in a fair manner with a strong commitment to compliance and ethics. We will stand firm against anti-social forces that threaten the order and safety of civil society.

#### Role of top management

Recognizing their responsibility in putting into practice the spirit of these Corporate Conduct Rules, our top management must set an example for others and work to spread awareness of these Rules.

Should an event occur that violates the spirit of these Rules, top management must take the initiative in dealing with the problem to determine the causes and prevent recurrence. Top management must also identify and take disciplinary action against those responsible, including themselves.

#### Compliance Action Guidelines (Revised on October 1, 2014)

[1] Basic Matters (omitted)

#### [2] Compliance Rules

#### 1. Relationship with Society

- (1) Contribution to Society
- a. We shall contribute to the sustainable development of Japan and the world by faithfully fulfilling the mission of the J-POWER Group to provide a stable supply of electricity.
- b. We shall act sensibly and responsibly as members of society, and conduct our duties with awareness and pride as members of the J-POWER Group.
   c. We shall actively participate in social contribution activities as a good corporate
- c. We shall actively participate in social contribution activities as a good corporate citizen, and contribute to the development of society. We shall continually conduct social contribution activities, including supporting culture and the arts, cooperating with local communities, supporting participation in volunteer activities, and contributing to international society, in order to fulfill our role as a good corporate citizen.
- (2) Appropriate Disclosure
- a. We shall not act in a way that leads to a loss of trust from society, such as disclosing false information or data, or willfully concealing information that should be made public.
- b. We shall respect diverse views, and not act in a way that hinders the formation of sound public opinion.

- c. In written statements and other information released as part of public relations activities, we will never use any slanderous expressions or socially discriminatory language.
- (3) Restrictions on Donations and Political Contributions
- a. In making political contributions or donations to all sorts of organizations, etc., we will comply with the Public Officers Election Act, Political Funds Control Act, and other related laws and regulations, and make them in accordance with regular methods.
- In accordance with Company regulations, we shall receive prior approval for contributions or donations.
- c. We will not offer bribes, illicit payments, or illegal political donations, and be extremely careful not to act in a way that may be construed as colluding with politicians or government agencies. We will strive to build sound and transparent relationships.
- (4) Barring Relations with Anti-social Forces
- To avoid illegal or anti-social behavior, we will have basic legal knowledge, an awareness of social norms and sense of justice, and strive to constantly exercise good sense.
- b. We will be resolute in dealing with the anti-social forces that threaten the order and safety of civil society, and never engage in relations of any sort. In the case of an improper demand from anti-social forces or other parties, we will maintain a firm stance, and never seek a resolution with money or other rewards.

- c. We will never use anti-social forces for Company or personal gain.
- d. We will never conduct business with anti-social forces, or businesses affiliated with anti-social forces.

#### (5) Environmental Protection

We continuously recognize the importance of environmental protection in all our business activities. We will comply with all environment-related laws and regulations, and proactively address global and local environmental issues based on our Environmental Management Vision.

#### (6) Appropriate Use of Information Systems

- a. We recognize that information security as a company with vital infrastructure is a social responsibility.
- b. We only use the Company's information systems for work purposes, and not for
- c. We strictly manage Company information, and encrypt data removed from Company premises to prevent the leak or theft of confidential information.
- d. When using computers or external storage media, we will run a virus scan to prevent damage from viruses and other malicious programs.
- e. We will properly manage our ID and password, and never illicitly access systems.
- f. When using the Internet, we always take care to ensure appropriate use, and, in our private lives as well, refrain from acts that could undermine the Company's social credibility.
- g. We use software appropriately, and shall not install software with a high risk of information leakage, such as free software or file sharing software.

#### (7) Protection of Intellectual Property Rights

The Company's intellectual property rights acquired through research and development or other business operations (inventions, utility models, designs, copyrights, trademarks, know-how, technical information, etc.) are important Company assets. We will use them properly, and strive to protect those rights.

- a. We will promptly submit applications and register the results that belong to the Company, and strive to protect the Company's intellectual property rights. b. We will never infringe upon the intellectual property rights of others, such as
- unauthorized copying of computer software.
- c. Intellectual property rights of business partners must only be used under appropriate license, and never illicitly.

#### (8) Compliance with Import-Export Laws and Regulations

- a. For the export and import of products, we will follow proper import/export and customs procedures in accordance with relevant laws and regulations.
- b. We will never import or export prohibited goods

#### 2. Relationships with Customers, Business Partners, and Competitors

(1) Safety and Reliability of Energy Supplies and Product Sales

- a. In supplying electric power and other forms of energy to society, with constant priority on ensuring safety, we will fully understand and comply with relevant laws, regulations, and standards. We will also take extreme care with regard to maintenance and operations, and strive to provide a stable energy supply with quality and safety.
- b. Similarly with regard to product sales, we will fully understand and comply with safety-related laws and safety standards, from development and manufacture to sales, repair, and maintenance, aiming for higher reliability. c. When we receive information that hampers safety or reliability, we will promptly
- confirm the facts, and if a problem is determined, contact the relevant departments and take appropriate action.

#### (2) Compliance with Antitrust Laws

Under no circumstances will we act in a manner that violates antitrust laws, including participation in cartels or collusion, maintaining of resale prices, or abuse of a dominant bargaining position. We will engage in fair and free competition.

- a. We will not make any agreements with other business operators that affect sales prices or terms of sale, and will not engage in collusive bidding or other unreasonable restraint of trade.
- b. We will not sell products at inappropriately low prices, restrict the selling prices of customers, or engage in other unfair business practices.

#### (3) Appropriate Business with Suppliers

In our business relations with suppliers, we will act with good sense and sincerity, and treat suppliers with impartiality and fairness.

- a. When choosing a supplier from among several companies, we will determine the optimal partner by fairly comparing and evaluating such factors as quality, price, delivery period, technical development capabilities, stable supply, and financial standing.
- b. We will not exert influence which provides certain suppliers with improper favorable treatment.
- c. When commissioning business partners for manufacturing, repairs, preparation of information deliverables, or rendering of services, we will conclude contracts and conduct business with a full understanding of the Subcontract Act, taking care to avoid delayed payment or other improper action.

#### (4) Prevention of Unfair Competition

- a. We will not acquire or use the trade secrets of other companies through theft or other improper means.
- b. We will not acquire or use the trade secrets of other companies that we know or suspect to have been obtained through improper means.

#### (5) Entertaining/Gifts

- a. Entertaining and gifts to business partners will be within the scope of social courtesy.
- b. When we have no choice but to accept entertaining or gifts from customers or business partners, it must be within the scope of social courtesy.

#### 3. Relationships with Company Assets, Accounting, Shareholders, and Investors

#### (1) Appropriate Use of Company Assets

Company assets need to be in a condition for efficient and ready use, and we should handle both tangible and intangible assets appropriately to prevent damage or theft. Company assets or expenditures may not be used for personal purposes.

#### (2) Appropriate Accounting Management and Tax Treatment

Entries on accounting ledgers or accounting slips will be made in accordance with relevant laws, regulations, and Company regulations. We will not disguise or conceal facts, create fictional records, or accumulate off-book assets.

#### (3) Disclosure of Management Information

We will provide shareholders and investors with timely and appropriate disclosure of management information, including the Company's financial condition and status of business activities. We will clearly convey the Company's management philosophy and policies, and take seriously any opinions or criticism regarding them.

#### (4) Prohibition on Insider Trading

We will not buy or sell Company stocks or bonds using internal information obtained during the course of business.

We will not buy or sell stocks or bonds regarding business partners with which we have a business relationship, competitors, or customers using internal information obtained during the course of business, prior to the disclosure of such information to ordinary investors.

We will handle internal information appropriately to prevent stock transactions using internal information, and not disclose such information to others not associated with the business.

#### 4. Relationships with Government Agencies and Public Officials

(1) Appropriate Approval and Notification Procedures

- a. We ensure that necessary procedures are taken such as obtaining approvals and submitting notifications.
- b. We will not neglect to submit necessary notifications, alter data, or take any action that leads to a loss of the Company's credibility.

#### (2) Entertaining and Gifts to Public Officials

We will not entertain or give gifts to public officials or equivalent persons in a manner that conflicts with the National Public Service Ethics Act or other rules prescribed by government agencies.

In addition, we will not give, promise, or offer financial or other rewards to for-eign government officials to improperly gain a business advantage, or in return for a business incentive.

#### 5. Relationships with Employees

#### (1) Respect for Human Rights

We will strive to constantly maintain a wholesome work environment, will respect human rights, and will never act in a way that leads to discrimination or denying

- a. We will not discriminate in any way, including on the grounds of birth, nationality, race, creed, religion, gender, physical condition, or social status.
- b. We will not engage in power harassment, sexual harassment, or similar types of behavior.

#### (2) Protection of Privacy

We will strictly manage the personal information of employees and external persons obtained during the course of business, and use this information only for business purposes, while preventing leakage of this information.

#### (3) Workplace Health and Safety

We will strive to provide a work environment with priority on health and safety, and will understand and comply with laws and regulations regarding workplace health and safety. Should a work-related accident occur, we will minimize the effects of the accident, and faithfully and promptly follow prescribed procedure, such as reporting, to prevent a recurrence.

#### (4) Compliance with Labor Laws

We will comply with labor-related laws, and strive to maintain a wholesome work environment with a pleasant atmosphere for a wide range of human resources.

- a. We will comply with the Labor Standards Act, and not impose duties that force employees to engage in excessive labor or overtime.
- b. We will comply with the overtime work agreement, and not require or condone unpaid overtime.
- c. We will conduct discussions with labor unions in good faith, and establish healthy labor-management relations.
- d. We will constantly strive to maintain a healthy mind and body of ourselves, and pay attention to the physical and mental health of subordinates.

- (5) Compliance with Rules of Employment a. We will adhere to discipline for work, and comply with matters prescribed by the Rules of Employment.
- b. We will respect the rights of employees prescribed by the Rules of Employment.

# Governance

#### **Emergency Management**

#### **Emergency Management Measures**

The J-POWER Group has a responsibility as an electric utility company to ensure a stable supply of electricity essential to the lives of people. We need to prevent damage to the equipment that produces and transmits electric power, and to restore service quickly should a disruption occur. Accordingly, the J-POWER Group implements the following measures.

- (1) Installation of appropriate facilities and development of disaster recovery systems in preparation for natural disasters including earthquakes, typhoons, lightning strikes, and tsunami
- (2) Enhanced security to prevent malicious and violent conduct
- (3) Enhancement of regular facility inspections to prevent major impediments to electric power supply and appropriate repairs and upgrades in response to aging, decline of function, and breakdowns
- (4) Preparation of action plans for responding to pandemics and other events that could have a major impact on business operations

#### **Emergency Management Systems**

The J-POWER Group has established the following systems to accurately forecast and prevent accidents, facility incidents, and other emergency events, and to respond and manage promptly and appropriately if such events occur.

#### (1) Emergency Response Team

A permanent organization at the J-POWER Headquarters. The Team forecasts emergencies and immediately take first-response action in the case of an occurrence, as well as oversees emergency management operations.

#### (2) Emergency Managers and Emergency Duty Personnel

Emergency Managers and Personnel are appointed at the Headquarters and local units to take first-response action and report information.

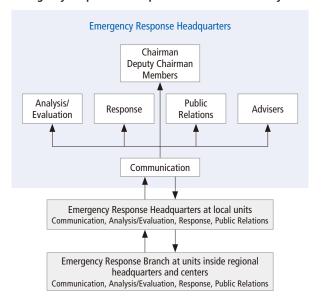
#### (3) Emergency Response Headquarters and Branches

When an emergency is predicted to occur or occurs and the seriousness warrants emergency countermeasures, the Emergency Response Headquarters (and Branches) are established.

#### **Emergency Response Headquarters Structure (Head Office)**

Structure	Composition
Chairman	President
Deputy Chairman	Executive Vice President
Members	Executive Officers in charge of General Affairs Dept. and related Executive Officers Department Directors of General Affairs Dept., Secretarial Affairs & Public Relations Dept., and other related departments
Emergency Management Task Force	Emergency Response Team and related departments
(Composition of Task Force)	(Division of Duties)
1. Communication	Communication, collection, and management of information
2. Analysis/Evaluation	Analysis, evaluation, response planning
3. Response	Restoration, liaison, response to victims, response to consumers, IR-related information
4. Public Relations	Relations with media
5. Advisers	Provide advice regarding analysis, evaluation, response planning, etc.

#### **Emergency Response Headquarters Communication System**



#### **Disaster Prevention and Business Continuity**

J-POWER, as an electric utility company responsible for vital lifelines, is a designated public institution under the Basic Act on Disaster Control Measures.

Accordingly, the Company has established physical measures assuming a large-scale natural disaster, as well as non-physical measures, such as various rules for when disasters occur, and a systematic disaster preparedness structure from the head office to local units. By actively implementing these measures, the Company further strengthens its disaster preparedness structure to ensure the continuation of business even in the event of a natural disaster exceeding assumptions.

#### Information Security

With advancements in technology and utilization of IT by corporations, information security has become increasingly important in light of the increase in instances of cyberattacks targeting specific companies and other threats. As an important infrastructure company responsible for ensuring a stable power supply in Japan and overseas, and constructing a nuclear power plant, the J-POWER Group is required to ensure a higher level of information security.

The J-POWER Group has established the Basic Policy on Information Security, and formulates an annual plan with specific measures based on activities in the previous fiscal year.

Of note, the Company is strengthening its collaboration with relevant government agencies and the electric power industry overall to ensure a rapid and appropriate response to any damage to IT systems vital to electric power operations, contributing to the stable supply of electric power from an IT perspective. In addition, the Company is taking robust information security measures in constructing the Ohma Nuclear Power Plant, with the IT department working in close coordination with the nuclear power department.

Note: Please refer to the J-POWER website for more information on the Basic Policy on Information Security, and information security measures. http://www.jpower.co.jp/english/privacy/index.html



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# **Consolidated Financial Statements**

### **Consolidated Balance Sheets**

		(Millions of yen)	
	2016/3	<b>2017</b> /3	
Assets			
Noncurrent Assets	2,232,286	2,271,046	
Electric Utility Plant and Equipment	948,252	958,754	
Hydroelectric Power Production Facilities	343,193	346,037	
Thermal Power Production Facilities	313,744	313,198	
Internal Combustion Engine Power Production Facilities	3,754	3,301	
Renewable Power Production Facilities	35,960	46,170	
Transmission Facilities	161,491	157,790	
Transformation Facilities	29,884	29,598	
Communication Facilities	8,449	8,186	
General Facilities	51,772	54,470	
Overseas Business Facilities	357,448	332,010	
Other Noncurrent Assets	101,827	92,501	
Construction in Progress	441,080	476,171	
Construction and Retirement in Progress	441,080	476,171	
Nuclear Fuel	73,447	73,682	
Nuclear Fuel in Processing	73,447	73,682	
Investments and Other Assets	310,231	337,926	
Long-Term Investments	234,506	253,660	
Net Defined Benefit Asset	_	2	
Deferred Tax Assets	43,818	40,514	
Other	31,950	43,794	
Allowance for Doubtful Accounts	(45)	(45)	
Current Assets	308,436	335,239	
Cash and Deposits	87,659	117,240	
Notes and Accounts Receivable –Trade	66,312	78,805	
Short-Term Investments	72,410	51,344	
Inventories	41,199	47,172	
Deferred Tax Assets	5,268	4,564	
Other	35,601	36,129	
Allowance for Doubtful Accounts	(14)	(18)	
Total Assets	2,540,723	2,606,285	

		(Millions of yen)
	2016/3	<b>2017</b> /3
Liabilities		
Noncurrent Liabilities	1,561,072	1,497,888
Bonds Payable	575,079	494,991
Long-Term Loans Payable	867,276	891,200
Lease Obligations	479	353
Other Provision	89	120
Net Defined Benefit Liability	65,912	58,079
Asset Retirement Obligations	11,685	11,971
Deferred Tax Liabilities	18,294	23,387
Other	22,254	17,783
Current Liabilities	304,100	344,377
Current Portion of Noncurrent Liabilities	158,131	208,760
Short-Term Loans Payable	28,009	24,957
Notes and Accounts Payable –Trade	37,033	24,616
Accrued Taxes	23,344	19,843
Other Provision	265	267
Asset Retirement Obligations	635	592
Deferred Tax Liabilities	22	5
Other	56,656	65,333
Reserves under the Special Laws	116	_
Reserve for Fluctuation in Water Levels	116	_
Total Liabilities	1,865,289	1,842,266
Net Assets		
Shareholders' Equity	650,817	689,542
Capital Stock	180,502	180,502
Capital Surplus	109,902	119,927
Retained Earnings	360,418	389,117
Treasury Shares	(4)	(5)
Accumulated Other Comprehensive Income	15,775	34,276
Valuation Difference on Available-for-Sale Securities	12,516	15,594
Deferred Gains or Losses on Hedges	(14,395)	(2,183)
Foreign Currency Translation Adjustment	30,464	21,295
Remeasurements of Defined Benefit Plans	(12,809)	(430)
Non-Controlling Interests	8,839	40,200
Total Net Assets	675,433	764,019
Total Liabilities and Net Assets	2,540,723	2,606,285



### **Consolidated Statements of Income**

		(Millions of yen)
	2016/3	<b>2017</b> /3
Operating Revenues	780,072	744,402
Electric Utility Operating Revenue	570,837	538,558
Overseas Business Operating Revenue	155,952	149,888
Other Business Operating Revenue	53,282	55,955
Operating Expenses	692,157	662,675
Electric Utility Operating Expenses	506,234	487,766
Overseas Business Operating Expenses	131,605	119,535
Other Business Operating Expenses	54,317	55,374
Operating Income	87,915	81,726
Non-Operating Income	17,871	20,526
Dividends Income	2,409	1,689
Interest Income	905	1,024
Share of Profit of Entities Accounted for Using Equity Method	10,889	13,258
Other	3,667	4,554
Non-Operating Expenses	47,248	35,103
Interest Expenses	30,495	29,798
Foreign Exchange Losses	12,888	_
Other	3,865	5,304
Total Ordinary Revenue	797,944	764,929
Total Ordinary Expenses	739,405	697,779
Ordinary Income	58,538	67,150
Provision or Reversal of Reserve for Fluctuation in Water Levels	116	_
Provision of Reserve for Fluctuation in Water Levels	116	_
Profit before Income Taxes	58,421	67,150
Income Taxes–Current	12,821	18,634
Income Taxes–Deferred	5,059	2,847
Total Income Taxes	17,880	21,482
Profit	40,540	45,667
Profit Attributable to Non-Controlling Interests	459	4,238
Profit Attributable to Owners of Parent	40,081	41,429

### **Consolidated Statements of Cash Flows**

Consolidated Statements of Cash Flows		(MAIII and of com)
	2016/3	(Millions of yen) <b>2017</b> /3
Cash Flows from Operating Activities		
Profit before Income Taxes	58,421	67,150
Depreciation and Amortization	94,582	75,660
Impairment Loss	1,392	2,624
Loss on Retirement of Noncurrent Assets	3,656	2,842
Increase (Decrease) in Net Defined Benefit Liability	(3,351)	9,276
Increase (Decrease) in Reserve for Fluctuation in Water Levels	116	_
Interest and Dividends Income	(3,314)	(2,713)
Interest Expenses	30,495	29,798
Decrease (Increase) in Notes and Accounts Receivable –Trade	2,445	(13,433)
Decrease (Increase) in Inventories	(3,259)	(5,503)
Increase (Decrease) in Notes and Accounts Payable –Trade	(3,085)	(6,477)
Share of (Profit) Loss of Entities Accounted for Using Equity Method	(10,889)	(13,258)
Other, Net	3,134	6,786
Subtotal	170,342	152,753
Interest and Dividends Income Received	13,573	13,229
Interest Expenses Paid	(30,554)	(30,224)
Income Taxes Paid	(7,232)	(20,317)
Net Cash Provided by (Used in) Operating Activities	146,130	115,440
Cash Flows from Investing Activities		
Purchase of Noncurrent Assets	(140,840)	(108,149)
Payments of Investment and Loans Receivable	(2,537)	(18,005)
Collection of Investment and Loans Receivable	15,960	2,577
Other, Net	(4,123)	(14,086)
Net Cash Provided by (Used in) Investing Activities	(131,541)	(137,663)
Cash Flows from Financing Activities		
Proceeds from Issuance of Bonds	_	79,702
Redemption of Bonds	(60,999)	(90,000)
Proceeds from Long-Term Loans Payable	96,697	83,762
Repayment of Long-Term Loans Payable	(110,783)	(69,108)
Increase in Short-Term Loans Payable	100,944	87,663
Decrease in Short-Term Loans Payable	(102,994)	(90,194)
Proceeds from Issuance of Commercial Papers	2,999	15,000
Redemption of Commercial Papers	(3,000)	(15,000)
Proceeds from Changes in Ownership Interests in Subsidiaries that Do not Result in Change in Scope of Consolidation	_	42,363
Cash Dividends Paid	(12,811)	(12,811)
Other, Net	1,315	(916)
Net Cash Provided by (Used in) Financing Activities	(88,632)	30,461
Effect of Exchange Rate Change on Cash and Cash Equivalents	(2,446)	267
Net Increase (Decrease) in Cash and Cash Equivalents	(76,490)	8,505
Cash and Cash Equivalents at Beginning of Period	236,439	159,949
Cash and Cash Equivalents at End of Period	159,949	168,454

# Financial Section/ Fact Data Management's Discussion and Analysis

#### **Financial Results**

#### **Operating Income**

Sales (operating revenues) declined 4.6% from the previous fiscal year to ¥744.4 billion, due mainly to a decline in fuel prices and a decrease in the load factor of thermal power plants in the Electric Power Business.

Operating expenses, despite an increase in retirement benefit expenses, decreased 4.3% to ¥662.6 billion, mainly due to the decrease in fuel costs stemming from the decline of the fuel price and the decrease in the load factor of thermal

power plants, along with a decrease in depreciation and amortization costs as a result of J-POWER's change of the accounting method for depreciation from the subject fiscal year (from the declining-balance method to the straight-line method).

As a result, operating income decreased 7.0% from the previous fiscal year, to ¥81.7 billion, with the operating income margin falling 0.3 point to 11.0%.

#### **Ordinary Income**

Ordinary revenue, the balance of operating and non-operating revenue, decreased 4.1% from the previous fiscal year to  $\pm$ 764.9 billion. Also, non-operating expenses fell 25.7% to  $\pm$ 35.1 billion, due mainly to the elimination of foreign exchange losses, while ordinary expenses declined 5.6% to  $\pm$ 697.7 billion. As a result, ordinary income increased 14.7% from the previous fiscal year to  $\pm$ 67.1 billion.

Ordinary income by reportable segment for the subject fiscal year is as follows.

#### **Electric Power Business**

Electricity sales volume from hydroelectric power plants decreased 17.6% during the subject fiscal year to 8.5 TWh, due mainly to a decrease in the water supply rate, from 111% in the previous fiscal year to 92%. Thermal power electricity sales volume decreased 4.9% to 53.5 TWh, mainly as a result of a decline in the load factor at J-POWER plants (from 80% to 75% on a non-consolidated basis). Overall, electricity sales volume decreased 6.7% from the previous fiscal year to 62.7 TWh.

Sales (electric utility operating revenue) declined 5.6% from the previous fiscal year to ¥540.2 billion, mainly due to the decline in the fuel price, and the decrease in the load factor of thermal power plants.

Segment income decreased 31.1% from the previous fiscal year to ¥22.2 billion, due mainly to the decline in sales and an increase in retirement benefit expenses.

#### **Electric Power-Related Business**

Sales (other business operating revenue) amounted to ¥357.3 billion, on a par with the previous fiscal year.

Segment income decreased 1.5% from the previous fiscal year to ¥14.2 billion, due mainly to the posting of an impairment loss for machinery in a coal mine.

#### **Overseas Business**

Electricity sales volume in the overseas business increased 5.7% from the previous fiscal year to 14.6 TWh. This was due mainly to full-term operation of the U-Thai IPP thermal power project in Thailand, which commenced commercial operation in 2015 (Unit No. 1 in June 2015, Unit No. 2 in December 2015).

Sales (overseas business operating revenue) decreased 3.9% from the previous fiscal year to ¥149.8 billion, due mainly to the decline in the price of fuel and the foreign exchange impact from the stronger yen, offsetting the increase in electricity sales volume.

Segment income increased 172.0% from the previous fiscal year to ¥31.2 billion, due mainly to the commercial operation of the U-Thai IPP thermal power project in Thailand throughout the term and the elimination of foreign exchange losses.

#### Other Business

Sales (other business operating revenue) increased 4.0% from the previous fiscal year to ¥23.9 billion.

Segment income increased 69.9% from the previous fiscal year to ¥1.3 billion, due mainly to the increase in sales.

#### **Profit before Income Taxes** -

Profit before income taxes increased 14.9% (¥8.7 billion) compared with the previous fiscal year to ¥67.1 billion.

#### **Profit Attributable to Owners of Parent**

Total income taxes increased 20.1% (¥3.6 billion) year on year to ¥21.4 billion, with profit attributable to owners of parent increasing 3.4% (¥1.3 billion) from the previous fiscal year to ¥41.4 billion.

#### Earnings per Share -

Earnings per share were ¥226.33 in fiscal 2016, compared with ¥218.97 in the previous fiscal year.

#### **Dividend Policy**

The most-instinctive feature of J-POWER's business is the utilization of long-term project management capabilities, including for the construction of power plants and other facilities, to invest in power plants and other types of infrastructure, and recover that investment through long-term operation of those assets. With regard to shareholder returns, J-POWER's top priority is to maintain stable dividend levels in line with the characteristics of its business. Further, the Company works to enhance returns through long-term initiatives to increase corporate value and achieve strong growth in a sustainable manner.

In accordance with this basic policy, the Company pays dividends from retained earnings twice a year, as an interim and

fiscal year-end dividend. The decision-making body for dividend payments is the Board of Directors for the interim dividend, and the General Meeting of Shareholders for the year-end dividend.

For fiscal 2016, the Company paid a dividend of ¥70 per share, comprising interim and year-end dividends of ¥35 per share. As a result, the payout ratio was 24.9%, with the ratio of dividends to shareholders' equity at 2.4%.

Of note, the Company stipulates in the Articles of Incorporation that it is able to pay an interim dividend as prescribed by Article 454-5 of the Companies Act.

#### **Financial Position**

#### **Assets**

Total assets at the end of the subject fiscal year (March 31, 2017) amounted to ¥2,606.2 billion, an increase of ¥65.5 billion from the previous fiscal year-end. This was due mainly to an increase in non-current assets.

#### Liabilities

Total liabilities amounted to ¥1,842.2 billion, a decrease of ¥23.0 billion from the previous fiscal year-end. Of this amount, interest-bearing debt decreased ¥8.7 billion to ¥1,620.0 billion. Non-recourse loans in overseas business accounted for ¥294.7 billion of interest-bearing debt.

#### **Net Assets**

Total net assets increased ¥88.5 billion from the previous fiscal year-end to ¥764.0 billion, due mainly to the recording of profit attributable to owners of parent. The shareholders' equity ratio increased from 26.2% at the previous fiscal year-end to 27.8%.



#### Capital Expenditures

Capital expenditures amounted to ¥105.8 billion, a decrease of ¥20.5 billion from the previous fiscal year. Of that amount, expenditures in the electric power business amounted to ¥107.8 billion, a decrease of ¥11.3 billion from the previous fiscal year, and expenditures related to the overseas business amounted to ¥1.3 billion, a decrease of ¥10.1 billion.

#### **Fund Procurement**

The majority of J-POWER's financing requirements are related to capital expenditures and debt refinancing. The Company's basic policy is to procure long-term funds. For the procuring of long-term funds, as means of maintaining low interest rates and a stable fund procurement, the Company issues straight bonds and procures long-term loans from financial institutions. The outstanding balances of straight bonds and borrowings at March 31, 2017, were ¥655.0 billion and ¥939.3 billion, respectively. For short-term funding, in addition to working capital the Company obtains flexible bridge financing from the standpoint of enhancing responsiveness in procurement. To meet short-term funding needs, the Company is able to issue up to ¥100.0 billion in commercial paper.

#### Cash Flows -

#### Cash Flows from Operating Activities

Cash inflow from operating activities decreased ¥30.6 billion from the previous fiscal year to ¥115.4 billion, due mainly to a decrease in depreciation and amortization cost and an increase in notes and accounts receivable-trade.

#### Cash Flows from Investing Activities

Cash outflow from investing activities increased ¥6.1 billion from the previous fiscal year to ¥137.6 billion, due mainly to the acquisition of an additional interest in the Elwood Energy Power Plant in the United States.

#### Cash Flows from Financing Activities

Cash inflow from financing activities amounted to ¥30.4 billion, compared to an outflow of ¥88.6 billion in the previous fiscal year. This was due mainly to an increase in funds procured from corporate bonds and the transfer of a portion of shares in a consolidated subsidiary.

As a result, cash and cash equivalents at March 31, 2017, increased  $\pm 8.5$  billion from the end of the previous fiscal year to  $\pm 168.4$  billion.

#### **Risk Factors**

This section discusses the main potential risks related to J-POWER's financial position, business results, current and future business operations, and other matters. From the perspective of actively disclosing information to investors, this

section also provides information to help investors understand business and other risks that the Company does not necessarily consider significant.

#### Impact of Reforms to the Electric Power Business Regulations on J-POWER's Electricity Revenue and Business

The Policy on Electricity System Reform was approved by the Cabinet in April 2013, bringing about drastic changes to the business environment surrounding J-POWER. Amendments to the Electricity Business Act fully liberalized market participation in the retail of electric power in April 2016, and eliminated regulations on wholesale electricity utilities (regulations of business permits and rates). Further, the legal unbundling of the transmission and distribution divisions of the former EPCOs and J-POWER will be required, with an approximate deadline of 2020. After the legal unbundling of transmission and distribution divisions, there are plans to review the regulations on electricity retail rates (transitional measures) for the former EPCOs.

With the revision of electric power business types in the system reforms, as of April 2016, J-POWER has changed from a wholesale electricity utility as prescribed in the Electricity Business Act prior to amendment to an electricity utility that conducts power generation and transmission businesses. Cost-basis rate regulations have been repealed, and rates related to the power generation business are now determined upon consultation with customers based on market competition. Rates related to the transmission business remain regulated, with a cost-basis rate system, to maintain a healthy transmission and distribution network system.

The majority of J-POWER's operating revenue comprises rate income from domestic sales to the former EPCOs. As market competition in the power generation business advances, to ensure that the value of our power generation business receives adequate assessment, we are therefore proceeding with appropriate rate consultations with customers, primarily the former EPCOs, while proceeding to diversify customers and trade using the Japan Electric Power Exchange (JEPX).

Still, in the case that there are major changes to business plans or operations due to shifts in long-term electricity demand, further market competition, consultations with customers, faults with facilities, or legislation, and such shifts cause an inability to secure adequate revenue to cover power generation costs, such a situation may adversely affect our performance.

#### Global Warming

J-POWER owns many coal-fired thermal power plants, which emit a relatively higher level of CO<sub>2</sub> with respect to power output compared to power plants using other fossil fuels, such as LNG. The Company is working to increase the efficiency and reduce the carbon emissions of its coal-fired thermal power. Also, we are working to expand our use of CO<sub>2</sub>-free power sources, such as renewable energy, and

developing nuclear power plants. Furthermore, based on the electricity business's Action Plan for Achieving a Low-Carbon Society established by electricity utilities including J-POWER in July 2015, we will do our utmost to achieve the targets set for the overall electric power industry.

However, going forward, if new legal regulations or other rules related to global warming countermeasures were to be introduced, causing major changes to business plans or operations, it could potentially have an adverse effect on our performance.

#### New Businesses in and outside Japan, Including Overseas Power Generation Business

J-POWER aims to build a new revenue platform by engaging in new electric power businesses domestically and overseas, including the overseas power generation business.

Specifically, in the overseas power generation business, we are applying the experience gleaned through our consulting services businesses in various countries in the pursuit of independent power producer (IPP) projects.

Also, in domestic electric power business, we are proceeding with new development of high-efficiency coal-fired thermal power plants as well as power generation businesses utilizing wind, geothermal, waste-fueled thermal, and other renewable energies.

However, these businesses may not generate the level of profits that we anticipate, due to unforeseeable circumstances, including major changes in operating conditions; changes in demand or the market environment; and changes in regulations. Changes in our business plans or the suspension of operations or construction prompted by such circumstances could result in related expenses or a need for additional funding that could potentially have an adverse effect on the results of our operations. Furthermore, some of these businesses are operated as joint ventures with third parties. In cases where the joint venture format is revised due to changes in the business environment or J-POWER is a minority equity owner and thus unable to engage in management and administration, the results of the joint venture may not beneficially impact our performance. In addition, overseas businesses entail foreign exchange risk as well as country risk due to political instability and other factors.



#### Capital Funds

The Company has invested a very large amount in power plants and other facilities. The funds for these investments have been procured mainly through borrowings and the issuance of bonds payable. We anticipate the need to raise funds in the future to invest in new domestic and overseas projects, such as Ohma Nuclear Power Plant and Takehara Thermal Power Plant New No. 1, and to repay existing obligations. If we are unable to raise required funds on acceptable terms and in a timely manner due to the prevailing conditions in the financial markets, the Company's credit situation, or other factors at that time, then this could potentially have material adverse effects on our business development and profitability.

#### Ohma Nuclear Power Plant Construction Project

With regard to the Ohma Nuclear Power Plant Project, the Japan Atomic Energy Commission concluded in the August 1995 decision that the plant has a policy-oriented role in enhancing flexibility of the plan to use MOX (uranium-plutonium mixed oxide) fuel in light water reactors because the plant adopts an advanced boiling water reactor with a view to using MOX fuel for the entire core (full MOX-ABWR). In addition, the commission expected the implementation of the plan not only by J-POWER, which has primary responsibility, but also under the auspices of the government and EPCOs. Accordingly, under the government's guidelines, the Company receives an R&D grant for the use of MOX fuel for the entire reactor core. Furthermore, the Company has already concluded basic agreements with nine former EPCOs, excluding The Okinawa Electric Power Company, Incorporated, that require the nine former EPCOs to purchase the total amount of electricity at fair cost.

As a nuclear power plant using MOX fuel for the entire core, the Ohma Nuclear Power Plant Project received consent from the local municipality of Ohma as well as Aomori Prefecture and was included by the Electric Power Development Coordination Council in the national Electric Power Development Master Plan as laid out by the Electric Power Development Promotion Act in August 1999. (The Electric Power Development Promotion Act was abolished in October 2003, and, with it, the system of the Electric Power Development Master Plan ended. The functions of the plan were taken on by the major power development site designation system, under which the project received site designation in February 2005.) In April 2008, the nuclear reactor installation permit was granted, and, in May of the same year, upon the initial approval of the construction work plan by the Minister of Economy, Trade and Industry, construction began. At that time, planned construction costs were ¥469.0 billion. Construction was suspended immediately after the Great East Japan Earthquake struck in March 2011 but was resumed in October 2012.

On December 16, 2014, we submitted an application for permission for alteration of a reactor installment license and an application for construction plan approval to the Nuclear Regulation Authority (NRA) in order to undergo a review of compliance with the New Safety Standards concerning nuclear power plants enforced by the NRA in July 2013. Specific examples of the wide-ranging measures include the raising of assumptions and enhancement of countermeasures with regard to earthquakes and tsunamis as design basis measures to prevent severe accidents, combined with the implementing of measures to prevent damage to the core and the containment vessel as severe accident countermeasures newly drawn up under the New Safety Standards. Furthermore, as terrorism countermeasures, such as the deliberate crashing of an aircraft, we have decided to install the specified severe accident response facility that will enable reactor decompression and other functions to be controlled remotely to inhibit the abnormal release of radioactive material outside due to damage sustained by the reactor containment vessel. The construction work for the additional safety enhancement measures compiled in the above-mentioned application will commence following confirmation that the content of the Company's application conforms to New Safety Standards when reviewed by the NRA. The Company forecasts that the additional construction work will cost approximately ¥130.0 billion. Moving forward, J-POWER will seriously and appropriately respond to the NRA's conformity reviews and steadily implement necessary safety measures or other measures required in a full-scale effort to build a safe power plant.

While it is impossible to predict the progress of the compliance review as an examinee, we aim to start construction work for the additional safety enhancement measures in the latter half of 2018, and aim to complete it in the latter half of 2023. However, the construction work schedule for the additional safety measures may be extended depending on changes surrounding the nuclear power business, the status of reviews by the NRA, and additional response to the New Safety Standards. Also, in such events, construction expenses may increase further, and other related costs may arise. In addition, nuclear power generation involves various risks, such as revisions of plans due to significant changes in conditions around the nuclear power business caused by review of Japan's nuclear policy, the advance of market competition, or other unexpected circumstances, as well as those associated with the storage and handling of radioactive materials, and risks other electric power plants are exposed to, such as natural disasters and unforeseen accidents after operations have commenced. J-POWER intends to ensure that these risks are avoided or minimized. However, if any of these risks should eventuate, it could adversely affect the business performance of the Company.

#### Fuel for Coal-Fired Thermal Power

J-POWER's coal-fired thermal power plants use imported coal as their main source of fuel. In procuring imported coal, the Company purchases coal from diverse sources in Australia, Indonesia, Russia, and elsewhere to seek both stable and economical supply. In addition, the Company holds interests in some coal mines aiming for stable coal supply. The Company's imported coal procurement is handled mainly under long-term or approximately one-year contracts, with spot purchasing to fill gaps as necessary. Coal purchase prices under long-term contracts are normally adjusted once per year in light of market prices.

The Company's fuel cost is impacted by such factors as changes in imported coal prices, supply and demand for transport vessels, and problems with the facilities or operations of suppliers. According to the power purchase agreements with customers for our major coal-fired thermal power plants, the electricity rates corresponding to fuel price properly reflect market conditions relating to fuel procurement. As a result, fluctuations in fuel cost have a limited impact on the business performance of J-POWER. However, if coal prices rise sharply, there will be a delay before the rise in fuel prices is reflected in electricity rates. This could have a temporary adverse effect on the results of our performance. Furthermore, should a significant fall in coal prices have a significant effect on the performance of the mine in which the Company holds an interest, the Company's performance could also be adversely affected.

#### Natural Disasters and Accidents

Should a natural disaster, human error, terrorist activity, fuel supply stoppage, or other unforeseen circumstance result in a major disruption of one of J-POWER's power plants or transmission or transformation facilities, or should such an event disrupt the information systems that control operations at these facilities, this could potentially hamper our business operations and consequently have an adverse effect on the surrounding environment. To prevent accidents at power plants as well as transmission and transformation facilities, which are important infrastructure for Japan, to ensure the safety of involved parties and to preserve the surrounding environment, J-POWER works to establish security and disaster prevention systems, take accident and disaster prevention measures and emergency response and recovery countermeasures, and implement environmental monitoring.

Nevertheless, if an accident or other events were to halt operations of J-POWER's power plant, transmission, or transformation facilities, or if an accident or other events were to negatively impact the surrounding environment, the Company's performance could be adversely affected.

#### **Legal Regulations**

Electric power business comprising the majority of J-POWER's business is regulated by the Electricity Business Act.

In line with the Amended Electricity Business Act of June 2014, regulations related to wholesale electricity utilities (regulations on business permits and rates) stipulated in the previous act were repealed in April 2016. However, J-POWER will continue to be regulated under the act as an electricity utility that conducts power generation and transmission businesses. Thus, J-POWER is subject to business and safety regulations as well as change and suspension orders derived from such regulations, and also to provisions regarding the cancellation of licenses to operate transmission businesses. Thus, where we are unable to comply with such laws and regulations, or if such laws or regulations are amended, these may adversely affect our business operations and performance. The Company's business operations are also subject to various other laws and regulations. If the Company is unable to comply with these laws and regulations, or if these laws and regulations are revised, this could potentially have an adverse effect on our business operations and performance.

Also, based on the concept of mutual aid for nuclear power operators, nuclear power business operators are obligated to contribute to expenses required for the Nuclear Damage Compensation and Decommissioning Facilitation Corporation, based on the Nuclear Damage Compensation and Decommissioning Facilitation Corporation Act, which aims to build a system that centers on a facilitation organization that can respond to nuclear damage compensation into the future. In relation to the Ohma Nuclear Power Plant Project, which is currently under way, J-POWER will pay contributions once the Ohma Nuclear Power Plant commences operation of the nuclear reactor, as stipulated in the Act on Compensation for Nuclear Damage. Depending on the amount of such contributions, this may adversely affect the performance of the Company.

### Management of Business Information

J-POWER holds a large amount of important information that must be kept confidential, including personal information. J-POWER controls this information carefully by implementing information security measures, employee training programs, and through other means. However, a leak of sensitive information outside the Company could adversely affect J-POWER's reputation and business performance.



# **Financial and Operating Highlights**

2008/3	2009/3	2010/3	2011/3	2012/3	
587,780	704,936	584,484	635,975	654,600	
531,764	648,362	530,289	584,436	609,775	
114,557	110,945	108,994	108,152	108,479	
342,734	460,336	349,693	406,488	424,436	
17,702	20,055	14,754	13,723	22,371	
		1,576	1,881	2,005	
56,016	56,574	52,617	49,657	42,819	
537,056	647,828	535,544	565,387	604,800	
50,724	57,108	48,939	70,588	49,800	
21,543	13,282	18,734	14,965	15,356	
		·	·	·	
			<u> </u>	<u> </u>	
22,749	22,616	23,085	22,371	22,005	
<del></del>		<del></del>	<del>_</del>	<del></del>	
	· · · · · · · · · · · · · · · · · · ·		<u> </u>	<u> </u>	
42,873	•	41,694		36,619	
<u> </u>	19,648	<u> </u>	19,1/6	3,382	
29,311	19,457	29,149	19,583	16,113	
114.49	100.75	92.89	85.74	79.08	
3.83	2.60	2.76	2.70	2.45	
33.72	34.90	33.32	30.15	31.69	
62,469	59,148	57,238	65,815	66,084	
8,287	8,384	9,214	10,267	10,318	
52,499	49,147	46,546	54,086	53,756	
1,682	1,616	1,477	1,462	2,010	
_	_	_	_	_	
Q5 0/	QQ 0/2	Q60/-	1060/-	1150/	
81%	/0%	08%	/8%	/ / %	
	587,780  531,764  114,557  342,734  17,702  —  56,016  537,056  50,724  21,543  8,879  12,664  29,394  22,749 — 6,644  42,873 — 29,311  114.49  3.83  33.72  62,469  8,287  52,499	587,780       704,936         531,764       648,362         114,557       110,945         342,734       460,336         17,702       20,055         —       —         56,016       56,574         537,056       647,828         50,724       57,108         21,543       13,282         8,879       7,470         12,664       5,812         29,394       30,791         22,749       22,616         —       —         6,644       8,174         42,873       39,599         —       12,170         —       19,648         29,311       19,457         114.49       100.75         3.83       2.60         33.72       34.90         62,469       59,148         8,287       8,384         52,499       49,147         1,682       1,616         —       —         85%       88%	587,780         704,936         584,484           531,764         648,362         530,289           114,557         110,945         108,994           342,734         460,336         349,693           17,702         20,055         14,754           —         —         1,576           56,016         56,574         52,617           537,056         647,828         535,544           50,724         57,108         48,939           21,543         13,282         18,734           8,879         7,470         11,722           12,664         5,812         7,011           29,394         30,791         25,979           22,749         22,616         23,085           —         —         —           6,644         8,174         2,894           42,873         39,599         41,694           —         19,648         —           29,311         19,457         29,149           114.49         100.75         92.89           3.83         2.60         2.76           33.72         34.90         33.32           62,469         59,148         57,238	587,780         704,936         584,484         635,975           531,764         648,362         530,289         584,436           114,557         110,945         108,994         108,152           342,734         460,336         349,693         406,488           17,702         20,055         14,754         13,723           —         —         1,576         1,881           56,016         56,574         52,617         49,657           537,056         647,828         535,544         565,387           50,724         57,108         48,939         70,588           21,543         13,282         18,734         14,965           8,879         7,470         11,722         9,072           12,664         5,812         7,011         5,893           29,394         30,791         25,979         29,231           22,749         22,616         23,085         22,371           —         —         12,170         —         1,635           —         12,170         —         1,635           —         19,648         —         19,176           29,311         19,457         29,149         19,583<	587,780         704,936         584,484         635,975         654,600           531,764         648,362         530,289         584,436         609,775           114,557         110,945         108,994         108,152         108,479           342,734         460,336         349,693         406,438         424,436           17,702         20,055         14,754         13,723         22,371           —         —         1,576         1,881         2,005           56,016         56,574         52,617         49,657         42,819           537,056         647,828         535,544         565,387         604,800           50,724         57,108         48,939         70,588         49,800           21,543         13,282         18,734         14,965         15,356           8,879         7,470         11,722         9,072         9,565           12,664         5,812         7,011         5,893         5,790           29,394         30,791         25,979         29,231         28,536           22,749         22,616         23,085         22,371         22,005           —         12,170         —         1,635

<sup>\*1</sup> Revenues of the overseas business segment (including revenues of overseas consolidated subsidiaries, overseas consulting businesses, etc.)
\*2 "Other Businesses Operating Revenue" is composed of revenues of "Electric Power-Related Business" and "Other Business."
\*3 Electric power sales volume of overseas consolidated subsidiaries (Electric power sales volume of equity method affiliates is not included.)

2013/3	2014/3	2015/3	2016/3
			(Millions of yen)
656,056	706,835	750,627	780,072
605,338	609,080	588,184	570,837
106,681	104,765	105,705	109,034
· · · · · · · · · · · · · · · · · · ·	•		
413,938	411,850	389,192	380,382
30,707	37,875	41,707	30,265
30,707	37,873	41,707	30,203
1,647	42,834	108,916	155,952
40.070	54.030	F2 F26	F2 202
49,070 <b>601,490</b>	54,920 <b>647,663</b>	53,526 <b>677,767</b>	53,282 <b>692,157</b>
54,566	59,171	72,859	87,915
17,577	22,357	22,714	17,871
11,311	22,337	22,71-4	17,071
11,728	16,380	15,659	10,889
5,849	5,976	7,054	6,981
27,318	41,451	36,223	47,248
22,362	25,305	28,224	30,495
991	11,190	1,547	12,888
3,964 <b>44,825</b>	4,955 <b>40,077</b>	6,451 <b>59,350</b>	3,865 <b>58,538</b>
44,023	2,386	2,127	J6,J36 
	2,360		
29,808	28,694	43,206	40,081
02.01	100 17	100.76	120.15
82.91	100.17	109.76	120.15
2.82	3.20	3.67	3.34
30.63	32.81	32.96	36.09
65.605	6E 424	64.040	(million kWh)
65,605	65,421	64,049	65,332
9,032	8,759	9,028	10,322
54,333	54,316	52,577	55,010
2,239	2,345	2,442	1,985
_	3,665	8,678	13,896
102%	99%	98%	111%
78%	79%	76%	80%

	<b>2017</b> /3
Consolidated:	2017/3
Operating Revenue/	
Expenses Comparison	(Millions of yen)
Operating Revenue	744,402
Electric Utility Operating	<del>.</del>
Revenue	538,558
Electric Power Generation	·
Business	487,263
Transmission/Transformation	
Business	49,021
Overseas Business Operating	
Revenue*1	149,888
Other Business Operating	
Revenue* <sup>2</sup>	55,955
Operating Expenses	662,675
Operating Income	81,726
Non-Operating Income	20,526
Share of Profit of Entities	
Accounted for Using Equity	
Method	13,258
Other	7,267
Non-Operating Expenses	35,103
Interest Expenses	29,798
Foreign Exchange Losses	<u> </u>
Other	5,304
Ordinary Income	67,150
Extraordinary Income	
Extraordinary Loss	
<b>Profit Attributable to Owners</b>	
of Parent	41,429
Average Exchange Rates	
(Yen/US\$)	108.34
Foreign Exchange Rate at	
December 31 (Yen/THB)	3.24
Foreign Exchange Rate at	
December 31 (THB/US\$)	35.83
Consolidated:	
Electricity Sales Volume	(million kWh)
Electric Power Business	62,791
Hydroelectric	8,508
Thermal	53,513
Wind	769
Overseas Business*3	14,687
Domestic Hydroelectric:	
Water Supply Rate	92%
Domestic Thermal:	
Load Factor (Non-consolidated)	75%



	2008/3	2009/3	2010/3	
Consolidated: Balance Sheet Items				
Noncurrent Assets	1,864,374	1,843,143	1,879,804	
Electric Utility Plant and Equipment	1,265,497	1,235,044	1,226,640	
Overseas Business Facilities	_	_	_	
Other Noncurrent Assets	40,270	46,634	49,619	
Construction in Progress	327,429	321,889	309,740	
Nuclear Fuel	10,310	27,650	38,688	
Investments and Other Assets	220,866	211,923	255,115	
Current Assets	148,756	162,325	144,276	
Total Assets	2,013,131	2,005,469	2,024,080	
Interest-Bearing Debt	1,423,878	1,470,748	1,452,515	
Other	121,134	152,607	156,583	
Total Liabilities	1,545,012	1,623,356	1,609,099	
Shareholders' Equity	464,266	408,036	426,680	
Accumulated Other Comprehensive Income	2,116	(27,908)	(14,003)	
Non-Controlling Interests	1,735	1,984	2,304	
Total Net Assets	468,118	382,112	414,981	
Consolidated: Cash Flow Items  Net Cash Provided by (Used in) Operating Activities	136,252	158,628	169,148	
Profit before Income Taxes	43,469	32,536	42,105	
(Reference) Depreciation and Amortization on	43,409	32,330	42,103	
a Non-Consolidated Basis	109,739	109,741	115,585	
Net Cash Provided by (Used in) Investing Activities	(152,518)	(132,350)	(129,504)	
Capital Expenditure for Subsidiaries	(16,561)	(15,628)	(13,502)	
(Reference) CAPEX on a Non-Consolidated Basis	(122,874)	(150,228)	(97,908)	
Free Cash Flow	(16,265)	26,278	39,643	
Consolidated: Financial Indicators				
Return on Assets (ROA)	2.1%	2.0%	2.1%	
ROA (after exclusion of the construction in progress of tangible fixed assets)	2.5%	2.4%	2.5%	
Return on Equity (ROE)	6.3%	4.6%	7.4%	
Net Income per Share (EPS) (Yen)	175.99	121.65	194.26	
Net Assets per Share (BPS) (Yen)	2,800.18	2,533.28	2,750.20	
Equity Ratio	23.2%	19.0%	20.4%	
Debt-Equity Ratio	3.1	3.9	3.5	
Number of Common Shares Issued at the End of the Period (Thousands) (excluding treasury stock)	166,554	150,054	150,053	

2011/3	2012/3	2013/3	2014/3	2015/3	2016/3	<b>2017</b> /3
						(Millions of yen)
1,842,658	1,849,786	1,975,202	2,149,579	2,275,453	2,232,286	2,271,046
1,178,492	1,111,251	1,058,849	1,023,751	986,552	948,252	958,754
		14,311	125,018	264,800	357,448	332,010
64,920	65,657	104,529	109,787	115,111	101,827	92,501
301,676	380,425	464,674	512,604	506,967	441,089	476,171
46,693	54,157	59,769	69,216	71,467	73,447	73,682
250,875	238,295	273,067	309,201	330,555	310,231	337,926
169,727	166,607	194,707	235,636	383,695	308,436	335,239
2,012,386	2,016,394	2,169,909	2,385,216	2,659,149	2,540,723	2,606,285
1,429,037	1,435,736	1,523,059	1,649,993	1,723,659	1,628,783	1,620,082
168,450	174,465	192,964	215,745	239,191	236,506	222,183
1,597,487	1,610,202	1,716,024	1,865,739	1,962,851	1,865,289	1,842,266
435,760	441,369	460,673	478,860	629,463	650,817	689,542
(19,997)	(33,985)	(6,768)	37,350	59,268	15,775	34,276
(863)	(1,191)	(19)	3,265	7,566	8,839	40,200
414,898	406,192	453,885	519,477	696,298	675,433	764,019
151,236	125,891	119,786	122,110	147,813	146,130	115,440
38,739	33,237	45,176	42,770	61,598	58,421	67,150
106,080	100,423	89,485	81,500	77,824	73,475	49,696
(124,675)	(136,852)	(170,369)	(177,375)	(142,964)	(131,541)	(137,663)
(30,200)	(64,235)	(100,277)	(95,747)	(87,971)	(37,530)	(17,500)
(73,796)	(68,493)	(66,262)	(86,554)	(61,119)	(106,386)	(99,844)
26,560	(10,960)	(50,582)	(55,264)	4,848	14,588	(22,223)
2.8%	1.8%	2.1%	1.8%	2.4%	2.3%	2.6%
3.3%	2.2%	2.7%	2.2%	2.9%	2.8%	3.2%
4.7%			5.9%			
	3.9%	6.9%		7.2%	5.9%	6.0%
130.51	107.39	198.65	191.23	284.43	218.97	226.33
2,770.77	2,714.94	3,024.98	3,440.23	3,762.52	3,641.59	3,954.22
20.7%	20.2%	20.9%	21.6%	25.9%	26.2%	27.8%
 3.4	3.5	3.4	3.2	2.5	2.4	2.2
150,053	150,053	150,052	150,051	183,050	183,049	183,049



	2008/3	2009/3	2010/3	2011/3	2012/3	
Non-Consolidated: Operating Revenues/ Expenses	20003	2003/3	2010/3	2011//3	2012/3	
Operating Revenues	529,250	645,850	530,436	583,213	599,973	
Electric Utility Operating						
Revenues	517,318	631,452	518,682	573,878	590,553	
Hydroelectric	114,557	110,945	108,994	108,152	108,479	
Thermal	342,734	460,336	349,693	406,488	424,436	
Transmission Revenue	60,025	60,170	59,993	59,237	57,638	
Incidental Business Operating Revenue	11,932	14,398	11,753	9,335	9,419	
Operating Expenses	489,363	601,122	489,531	520,569	557,628	
Electric Utility Operating						
Expenses	478,579	588,224	479,085	513,395	549,010	
Personnel Expense	37,689	43,571	36,187	31,276	34,441	
Amortization of						
the Actuarial Difference*	6,355	10,787	3,408	(2,213)	1,752	
Fuel Cost	185,357	255,156	173,957	209,967	238,497	
Repair Expense	32,757	55,419	45,390	50,635	54,286	
Depreciation and Amortization Cost	109,739	109,741	115,585	106,080	100,423	
Other	113,034	124,334	107,965	115,435	121,362	
Incidental Business Operating						
Expenses	10,783	12,897	10,446	7,174	8,617	
Operating Income	39,887	44,728	40,904	62,644	42,344	
(Amortization of the Actuarial Difference) Actuarial The Remainders in the						
Difference Previous Year	(1,785)	2,936	4,983	1,574	(1,022)	
Actuarial Difference in the Present Year	11,077	12,835	_	_	_	
Actuarial Difference in the Previous Year	_	_	_	(4,811)	3,584	
Subtotal	9,291	15,771	4,983	(3,236)	2,561	
Amortization*	6,355	10,787	3,408	(2,213)	1,752	
The Remainders in the Present Year	2,936	4,983	1,574	(1,022)	809	
[Repair Expenses]						
Hydroelectric	6,893	14,752	8,009	8,112	13,039	
Thermal	22,436	36,195	33,242	38,765	35,733	
Transmission/Transformation	1,875	2,518	2,327	2,259	3,761	
Others	1,553	2,133	1,811	1,496	1,753	
Total	32,757	55,419	45,390	50,635	54,286	
[Depreciation]						
Hydroelectric	25,425	24,921	24,054	23,553	23,418	
Thermal	61,069	61,970	69,307	61,318	56,707	
Transmission/Transformation	19,021	18,470	17,752	16,849	16,053	
	19,021 4,222	18,470 4,379	17,752 4,470	16,849 4,359	16,053 4,242	

<sup>\*</sup> Until the year ended March 31, 2009, actuarial differences were amortized from the year in which they occurred. Since the year ended March 31, 2010, actuarial differences are amortized from the year following the year in which they occurred.

2013/3	2014/3	2015/3	2016/3
			(A.EIII ( )
586,993	582,861	557,943	(Millions of yen) <b>552,341</b>
360,993	302,001	337,343	332,341
577,284	572,937	548,580	543,019
106,681	104,765	105,705	109,034
413,938	411,935	389,607	381,201
56,664	56,236	53,267	52,783
9,708	9,923	9,363	9,322
543,659	542,396	513,387	510,770
534,765	533,444	504,946	502,326
34,084	29,810	28,566	31,811
EOE	(2,000)	(4 272)	(2.200)
505 238,441	(3,099) 250,259	(4,372) 228,482	(2,308) 218,481
56,454	58,521	61,005	58,325
50,434	30,321	01,005	30,323
89,485	81,500	77,824	73,475
116,299	113,352	109,067	120,231
		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
8,894	8,952	8,441	8,444
43,333	40,464	44,555	41,570
000	222	(1.421)	(2.010)
809	233	(1,431)	(2,019)
(70)	(4,746)	(4,960)	(1,354)
738	(4,530)	(6,392)	(3,374)
505	(3,099)	(4,372)	(2,308)
233	(1,431)	(2,019)	(1,066)
11,340	11,776	13,391	12,160
40,438	41,942	42,382	40,985
3,161	3,205	3,671	3,495
1,513	1,596	1,558	1,683
56,454	58,521	61,005	58,325
21,852	21,318	20,947	20,640
48,411	40,879	37,982	33,409
15,302	15,074	14,395	13,871
3,919	4,226	4,500	5,553
89,485	81,500	77,824	73,475

	2045
	<b>2017</b> /3
Non-Consolidated:	
Operating Revenues/	
Expenses	(Millions of yen)
Operating Revenues	552,460
Electric Utility Operating	540.000
Revenues	510,909
Electric Power Sales	457,953
Transmission and Other	52,955
Incidental Business Operating	
Revenue	11,551
Operating Expenses	494,829
Electric Utility Operating	
Expenses	484,288
Personnel Expense	43,657
Amortization of	
the Actuarial Difference*	10,726
Fuel Cost	196,843
Repair Expense	68,348
Depreciation and	
Amortization Cost	49,696
Other	125,743
Incidental Business Operating	
Expenses	10,540
Operating Income	27,630
(Amortization of the Actuarial Difference)	
Actuarial The Remainders in the Difference Previous Year	(1,066)
Actuarial Difference in the Present Year	
Actuarial Difference in	
the Previous Year	16,748
Subtotal	15,682
Amortization*	10,726
The Remainders in the Present Year	4,956
The Remainders in the Fresenc Teal	1,550
[Repair Expenses]	
Hydroelectric	11,915
Thermal	50,770
Transmission/Transformation	3,948
Others	1,713
Total	68,348
lotai	00,340
[Doprociation]	
[Depreciation]	10 0/10
Hydroelectric Thermal	13,245
Thermal	23,007
Transmission/Transformation	10,068
Others	3,373
Total	49,696



# **10-Year Consolidated Financial Data**

<b>Consolidated Balance Sheets</b>	2008/3	2009/3	2010/3	
Assets				
Noncurrent Assets	1,864,374	1,843,143	1,879,804	
Electric Utility Plant and Equipment	1,265,497	1,235,044	1,226,640	
Hydroelectric Power Production Facilities	450,635	441,694	403,329	
Thermal Power Production Facilities	504,468	463,682	482,045	
Internal Combustion Engine Power Production Facilities	14,141	12,906	11,764	
Renewable Power Production Facilities	_	_	24,334	
Transmission Facilities	229,312	217,723	207,948	
Transformation Facilities	34,310	36,615	35,089	
Communication Facilities	9,289	9,591	9,339	
General Facilities	23,339	52,830	52,789	
Overseas Business Facilities	_	_	_	
Other Noncurrent Assets	40,270	46,634	49,619	
Construction in Progress	327,429	321,889	309,740	
Construction and Retirement in Progress	327,429	321,889	309,740	
Nuclear Fuel	10,310	27,650	38,688	
Nuclear Fuel in Processing	10,310	27,650	38,688	
Investments and Other Assets	220,866	211,923	255,115	
Long-Term Investments	165,015	150,332	195,414	
Net Defined Benefit Asset	_	_	_	
Deferred Tax Assets	51,777	58,711	57,207	
Other	4,222	3,414	2,964	
Allowance for Doubtful Accounts	(149)	(534)	(471)	
Current Assets	148,756	162,325	144,276	
Cash and Deposits	33,961	27,628	38,749	
Notes and Accounts Receivable–Trade	44,650	50,014	47,003	
Short-Term Investments	2,983	2,592	2,253	
Inventories	25,329	43,110	25,717	
Deferred Tax Assets	5,655	6,264	5,560	
Other	36,253	32,718	24,995	
Allowance for Doubtful Accounts	(77)	(2)	(2)	
Total Assets	2,013,131	2,005,469	2,024,080	

Note: In accordance with revisions in Electric Utility Accounting Regulations, wind power and geothermal power production facilities are recorded as "Renewable Power Production Facilities" from the fiscal year ended March 31, 2010.

Until the year ended March 31, 2012, "Overseas Business Facilities" was included in "Other Noncurrent Assets," but it has been presented separately from the year ended March 31, 2014 due to the increase in monetary importance due to progress in the Thai projects. For year-on-year comparison purposes, it is also presented separately in the year ended March 31, 2013.

Accounting policies were partially changed from the year ended March 31, 2017 and the figures for the year ended March 31, 2016 reflect retroactive application of the change.

<b>2017</b> /3	2016/3	2015/3	2014/3	2013/3	2012/3	2011/3
(Millions of yen)						
2,271,046	2,232,286	2,275,453	2,149,579	1,975,202	1,849,786	1,842,658
958,754	948,252	986,552	1,023,751	1,058,849	1,111,251	1,178,492
346,037	343,193	348,911	355,616	363,437	374,510	389,892
313,198	313,744	334,252	362,307	387,957	423,049	454,823
3,301	3,754	5,105	5,414	3,956	4,296	4,694
46,170	35,960	40,877	36,698	31,358	34,479	38,436
157,790	161,491	168,680	176,102	185,754	186,274	197,163
29,598	29,884	30,206	30,482	30,608	31,774	34,456
8,186	8,449	8,469	8,596	8,638	9,065	9,539
54,470	51,772	50,049	48,532	47,137	47,801	49,486
332,010	357,448	264,800	125,018	14,311	_	_
92,501	101,827	115,111	109,787	104,529	65,657	64,920
476,171	441,080	506,967	512,604	464,674	380,425	301,676
476,171	441,080	506,967	512,604	464,674	380,425	301,676
73,682	73,447	71,467	69,216	59,769	54,157	46,693
73,682	73,447	71,467	69,216	59,769	54,157	46,693
337,926	310,231	330,555	309,201	273,067	238,295	250,875
253,660	234,506	269,891	244,181	202,464	181,132	181,934
2	_	278	_	_	_	_
40,514	43,818	38,705	40,734	47,234	52,571	56,843
43,794	31,950	21,725	24,331	24,416	5,653	13,292
(45)	(45)	(45)	(45)	(1,047)	(1,062)	(1,196)
335,239	308,436	383,695	235,636	194,707	166,607	169,727
117,240	87,659	69,151	50,333	49,283	35,112	37,202
78,805	66,312	71,288	70,135	61,644	59,283	57,781
51,344	72,410	167,433	35,000	402	1,331	2,346
47,172	41,199	37,781	34,053	38,160	34,972	32,400
4,564	5,268	5,736	8,637	7,423	6,688	5,998
36,129	35,601	32,337	37,477	37,847	29,284	34,006
(18)	(14)	(32)	(0)	(54)	(63)	(9)
2,606,285	2,540,723	2,659,149	2,385,216	2,169,909	2,016,394	2,012,386



	2008/3	2009/3	2010/3	
Liabilities				
Noncurrent Liabilities	1,276,354	1,304,830	1,346,526	
Bonds Payable	602,903	717,867	689,883	
Long-Term Loans Payable	624,495	513,239	580,925	
Lease Obligations	_	520	811	
Provision for Retirement Benefits	39,083	51,931	57,855	
Other Provision	553	1,098	1,111	
Net Defined Benefit Liability	_		_	
Asset Retirement Obligations	_		_	
Deferred Tax Liabilities	1,462	2,352	3,459	
Other	7,856	17,820	12,479	
Current Liabilities	267,097	317,379	261,837	
Current Portion of Noncurrent Liabilities	101,565	120,700	142,923	
Short-Term Loans Payable	6,126	9,098	13,327	
Commercial Papers	88,949	109,971	24,998	
Notes and Accounts Payable –Trade	14,790	10,144	14,804	
Accrued Taxes	11,407	16,317	7,952	
Other Provision	555	713	855	
Asset Retirement Obligations	_	_	_	
Deferred Tax Liabilities	2	9	5	
Other	43,700	50,423	56,970	
Reserves under Special Laws	1,560	1,146	734	
Reserve for Fluctuation in Water Levels	1,560	1,146	734	
Total Liabilities	1,545,012	1,623,356	1,609,099	
Net Assets				
Shareholders' Equity	464,266	408,036	426,680	
Capital Stock	152,449	152,449	152,449	
Capital Surplus	81,849	81,849	81,849	
Retained Earnings	230,032	236,998	255,643	
Treasury Shares	(64)	(63,260)	(63,262)	
Accumulated Other Comprehensive Income	2,116	(27,908)	(14,003)	
Valuation Difference on Available-for-Sale Securities	1,934	(404)	2,960	
Deferred Gains or Losses on Hedges	(6,759)	(6,285)	(3,747)	
Foreign Currency Translation Adjustment	6,941	(21,217)	(13,217)	
Remeasurements of Defined Benefit Plans	_	_	_	
Non-Controlling Interests	1,735	1,984	2,304	
Total Net Assets	468,118	382,112	414,981	
Total Liabilities and Net Assets	2,013,131	2,005,469	2,024,080	

Note: The "Accounting Standards for Retirement Benefits" (Corporate Accounting Standard No. 26 of May 17, 2012) and the "Guidelines for Applying Accounting Standards for Retirement Benefits" (Corporate Accounting Standard Application Guideline No. 25 of May 17, 2012) are applied from the end of the consolidated fiscal year ended March 31, 2014.

<sup>2014.</sup>Accounting policies were partially changed from the year ended March 31, 2017 and the figures for the year ended March 31, 2016 reflect retroactive application of the change.

<b>2017</b> /3	2016/3	2015/3	2014/3	2013/3	2012/3	2011/3
(2.100)						
(Millions of yen)	1,561,072	1,633,825	1,522,905	1,402,287	1,324,663	1,319,146
<b>1,497,888</b> 494,991	575,079	666,061	691,346	694,930	714,914	734,898
891,200	867,276	857,846	741,509	608,977	522,407	500,913
353	479	697	981	982	983	1,093
	479		<del></del>	59,012	58,015	57,069
120	89	84	43	35,012	25	
58,079	65,912	48,901	49,071			_
11,971	11,685	7,510	6,644	3,971	4,585	3,620
23,387	18,294	20,394	14,730	7,801	6,390	5,869
17,783	22,254	32,327	18,579	26,574	17,339	15,666
344,377	304,100	329,025	342,714	313,311	284,761	277,563
208,760	158,131	169,754	207,968	196,999	166,342	162,958
		30,044	207,308	18,475	18,443	17,528
24,957	28,009	30,044	20,510	3,999	12,999	11,999
24,616	37,033	44,035	33,197	25,049	20,011	20,112
	23,344	13,516		10,811	11,408	21,322
19,843 267	25,344	270	8,791 302	273	325	317
592	635	372	245	1,495	626	473
5	22	5	9	3	4	11
65,333	56,656 <b>116</b>	71,027	71,880 <b>119</b>	56,202 <b>425</b>	54,599 <b>777</b>	42,839 <b>777</b>
	116		119	425	777	777
4 042 266		4 062 054				
1,842,266	1,865,289	1,962,851	1,865,739	1,716,024	1,610,202	1,597,487
689,542	650,817	629,463	478,860	460,673	441,369	435,760
180,502	180,502	180,502	152,449	152,449	152,449	152,449
119,927	109,902	109,902	81,849	81,849	81,849	81,849
389,117	360,418	339,061	307,829	289,639	270,334	264,724
(5)	(4)	(2)	(63,268)	(63,265)	(63,264)	(63,263)
34,276	15,775	59,268	37,350	(6,768)	(33,985)	(19,997)
15,594	12,516	19,860	9,030	4,855	(772)	(137)
(2,183)	(14,395)	(15,821)	1,772	(6,929)	(4,209)	611
21,295	30,464	53,205	22,955	(4,693)	(29,003)	(20,471)
(430)	(12,809)	2,023	3,592	<del></del>	<del></del>	
40,200	8,839	7,566	3,265	(19)	(1,191)	(863)
764,019	675,433	696,298	519,477	453,885	406,192	414,898
2,606,285	2,540,723	2,659,149	2,385,216	2,169,909	2,016,394	2,012,386



Consolidated Statements of Income	2008/3	2009/3	2010/3	
	507.700	704.026	504.404	
Operating Revenues	587,780	704,936	584,484	
Electric Utility Operating Revenue	531,764	648,362	530,289	
Overseas Business Operating Revenue			1,576	
Other Business Operating Revenue	56,016	56,574	52,617	
Operating Expenses	537,056	647,828	535,544	
Electric Utility Operating Expenses	477,869	588,808	478,644	
Overseas Business Operating Expenses	<del></del>	<del>_</del>		
Other Business Operating Expenses	59,186	59,019	56,899	
Operating Income	50,724	57,108	48,939	
Non-Operating Income	21,543	13,282	18,734	
Dividends Income	1,567	1,706	1,406	
Interest Income	1,213	960	581	
Gain on Sales of Securities	3,911	<u> </u>		
Share of Profit of Entities Accounted for Using Equity Method	8,879	7,470	11,722	
Other	5,972	3,145	5,024	
Non-Operating Expenses	29,394	30,791	25,979	
Interest Expenses	22,749	22,616	23,085	
Foreign Exchange Losses	_	_	_	
Other	6,644	8,174	2,894	
Total Ordinary Revenue	609,324	718,219	603,218	
Total Ordinary Expenses	566,450	678,619	561,524	
Ordinary Income	42,873	39,599	41,694	
Provision or Reversal of Reserve for Fluctuation in Water				
Levels	(595)	(413)	(411)	
Provision of Reserve for Fluctuation in Water Levels	_	_	_	
Reversal of Reserve for Fluctuation in Water Levels	(595)	(413)	(411)	
Extraordinary Income	_	12,170	_	
Extraordinary Loss	_	19,648	_	
Profit before Income Taxes	43,469	32,536	42,105	
Income Taxes-Current	15,962	17,928	11,270	
Income Taxes–Deferred	(1,829)	(4,945)	1,883	
Total Income Taxes	14,132	12,982	13,153	
Profit	_	_	_	
Profit Attributable to Non-Controlling Interests	24	95	(197)	

Note: Until the year ended March 31, 2012, "Overseas Business Operating Revenue" was included in "Other Business Operating Revenue," but it has been presented separately from the year ended March 31, 2014 due to the increase in monetary importance due to progress in the Thai projects. For year-on-year comparison purposes, it is also presented separately in the year ended March 31, 2013.

Until the year ended March 31, 2012, "Overseas Business Operating Expenses" was included in "Electric Utility Operating Expenses" and "Other Business Operating Expenses" es," but it has been presented separately from the year ended March 31, 2014 due to the increase in monetary importance due to progress in the Thai projects. For year-on-year comparison purposes, it is also presented separately in the year ended March 31, 2013.

Under each item, there are cases of fiscal years in which the monetary importance has been minor being included and represented under another item.

Accounting policies were partially changed from the year ended March 31, 2017 and the figures for the year ended March 31, 2016 reflect retroactive application of the

Under each item, there are cases of fiscal years in which the monetary importance has been minor being included and represented under another item.

<b>2017</b> /3	2016/3	2015/3	2014/3	2013/3	2012/3	2011/3
2017/3	2010/3	2013/3	2014/3	2013/3	2012/3	2011/3
(Millions of yen)						
744,402	780,072	750,627	706,835	656,056	654,600	635,975
538,558	570,837	588,184	609,080	605,338	609,775	584,436
149,888	155,952	108,916	42,834	1,647	2,005	1,881
55,955	53,282	53,526	54,920	49,070	42,819	49,657
662,675	692,157	677,767	647,663	601,490	604,800	565,387
487,766	506,234	521,351	545,430	540,134	553,873	509,116
119,535	131,605	98,979	43,899	8,346		_
55,374	54,317	57,436	58,333	53,009	50,927	56,271
81,726	87,915	72,859	59,171	54,566	49,800	70,588
20,526	17,871	22,714	22,357	17,577	15,356	14,965
1,689	2,409	1,869	1,454	1,321	1,315	1,499
1,024	905	1,155	1,054	1,195	968	1,220
_	_	_	_	_	_	
13,258	10,889	15,659	16,380	11,728	9,565	9,072
4,554	3,667	4,030	3,468	3,331	3,506	3,172
35,103	47,248	36,223	41,451	27,318	28,536	29,231
29,798	30,495	28,224	25,305	22,362	22,005	22,371
_	12,888	1,547	11,190	991	_	_
5,304	3,865	6,451	4,955	3,964	6,530	6,860
764,929	797,944	773,341	729,192	673,634	669,957	650,941
697,779	739,405	713,991	689,115	628,808	633,337	594,619
67,150	58,538	59,350	40,077	44,825	36,619	56,322
	446	(440)	(205)	(254)		42
	116	(119)	(306)	(351)	_	42
	116	(110)	(206)	(251)	<del></del>	42
<del></del> _	<del></del>	(119)	(306) <b>2,386</b>	(351)	<del></del>	
<del>_</del>	<del>_</del>	2,127	2,300		3,382	19,176
67,150	58,421	61,598	42,770	45,176	33,237	38,739
						20,403
18,634	12,821	7,468	8,372	11,940	12,953	
2,847	5,059	9,917	6,579	3,622	4,370	2,459
21,482 45,667	17,880 40,540	17,386	14,952	15,562	17,324	22,863
		44,212	27,817	29,613	15,913	15,876
4,238	459	1,005	(876)	(194)	(200)	(3,707)
41,429	40,081	43,206	28,694	29,808	16,113	19,583



onsolidated Statements of Cash Flows	2008/3	2009/3	2010/3	
sh Flows from Operating Activities				
Profit before Income Taxes	43,469	32,536	42,105	
Depreciation and Amortization	115,021	114,669	120.313	
Impairment Loss	267	439	384	—
Loss on Liquidation of Business	207	439	304	
Loss on Retirement of Noncurrent Assets	2,611	4,182	2,516	
Disaster Recovery Expenses		, 102 		
Increase (Decrease) in Provision for Retirement Benefits	6,471	12,848	5,923	
Increase (Decrease) in Net Defined Benefit Liability	— —			
Increase (Decrease) in Reserve for Fluctuation in Water Levels	(595)	(413)	(411)	
Interest and Dividends Income	(2,780)	(2,666)	(1,987)	
Interest Expenses	22,749	22,616	23,085	
Decrease (Increase) in Notes and Accounts Receivable—Trade	2,120	(6,040)	6,311	
Decrease (Increase) in Inventories	(4,375)	(17,637)	17,645	
Increase (Decrease) in Notes and Accounts Payable–Trade	4,027	(1,109)	7,034	
Loss (Gain) on Sales of Securities	(3,911)	2	(231)	
Loss (Gain) on Valuation of Securities	_	19,648	_	
Share of (Profit) Loss of Entities Accounted for Using Equity Method	(8,879)	(7,470)	(11,722)	
Loss (Gain) on Sales of Shares of Subsidiaries				
Loss (Gain) on Sale of Noncurrent Assets	(1,004)	38	(590)	
Distribution by Dissolution of Anonymous Association	_	(12,170)		
Other, Net	(6,398)	24,235	(10,205)	
Subtotal	168,792	183,709	200,170	
Interest and Dividends Income Received	3,370	15,368	5,845	
Interest Expenses Paid	(22,453)	(22,079)	(22,987)	
Income Taxes Paid	(13,458)	(18,369)	(13,880)	
Cash Provided by (Used in) Operating Activities	136,252	158,628	169,148	
h Flows from Investing Activities				
Proceeds from Contribution Received for Construction	7,509	8,619	9,962	
Purchase of Noncurrent Assets	(134,723)	(173,119)	(114,967)	_
Proceeds from Sales of Noncurrent Assets	1,552	58,657	1,860	_
Payments of Investments and Loans Receivable	(35,965)	(27,643)	(23,456)	
Collections of Investments and Receivable	6,650	7,901	3,896	
Purchase of Investments in Subsidiaries Resulting in	0,050	,,501	5,050	_
Change in Scope of Consolidation	(1,280)	(2,611)	(495)	
Proceeds from Purchase of Investments in Subsidiaries,	, , , , , , , , , , , , , , , , , , ,	S 12 /	, -/	
Net of Cash Acquired	_	_	_	
Proceeds from Sales of Shares of Subsidiaries Resulting in				_
Change in Scope of Consolidation	8,064			
Other, Net	(4,325)	(4,154)	(6,305)	
Cash Provided by (Used in) Investing Activities	(152,518)	(132,350)	(129,504)	
h Flows from Financing Activities				
Proceeds from Issuance of Bonds	89,675	114,570	59,792	_
Redemption of Bonds	(38,384)	(60,300)		_
Proceeds from Long-Term Loans Payable	114,864	9,803	122,794	
Repayment of Long-Term Loans Payable	(135,532)	(41,287)	(121,555)	
Increase in Short-Term Loans Payable	18,551	193,040	42,500	
Decrease in Short-Term Loans Payable	(14,549)	(190,023)	(38,294)	
Proceeds from Issuance of Commercial Papers	586,322	639,380	475,905	_
Redemption of Commercial Papers	(594,000)	(619,000)	(561,000)	
Proceeds from Issuance of Common Shares				
Proceeds from Stock Issuance to Minority Shareholders	266	_	_	
Purchase of Treasury Stock	(7)	(63,195)	_	_
Proceeds from Sales of Treasury Shares			_	_
Proceeds from Changes in Ownership Interests in Subsidiaries that				
Do not Result in Change in Scope of Consolidation	_	_	_	
Cash Dividends Paid	(9,989)	(12,499)	(10,503)	_
Cash Dividends Paid to Minority Shareholders	(42)	(20)	(2)	_
Other, Net	(7)	(83)	11	_
Cash Provided by (Used in) Financing Activities	17,174	(29,615)	(30,351)	
ect of Exchange Rate Change on Cash and Cash Equivalents	147	(2,764)	1,506	
t Increase (Decrease) in Cash and Cash Equivalents	1,056	(6,101)	10,798	
h and Cash Equivalents at Beginning of Period rease (Decrease) in Cash and Cash Equivalents	34,575	35,631	29,530	
rease (Decrease) in Cash and Cash Equivalents om the Addition of Consolidated Subsidiaries			_	
sh and Cash Equivalents at the End of Period	35,631	29,530	40,329	
ni ana cash Equivalents at the End Of Fefilla	33,031	23,330	40,323	

Note: Accounting policies were partially changed from the year ended March 31, 2017 and the figures for the year ended March 31, 2016 reflect retroactive application of the change. Under each item, there are cases of fiscal years in which the monetary importance has been minor being included and represented under another item.

2011/3	2012/3	2013/3	2014/3	2015/3	2016/3	2017/з
						(Millions of yen)
38,739	33,237	45,176	42,770	61,598	58,421	67,150
111,644	105,271	95,254	91,408	93,309	94,582	75,660
9,266	946		14	2,489	1,392	2,624
4,550				2.250		
2,941 —	2,434 3,382	2,418	2,241	2,359	3,656	2,842
(779)	<u></u>					<u>_</u> _
(773)			(4,800)	(4,611)	(3,351)	9,276
42	_	(351)	(306)	(119)	116	
(2,720)	(2,284)	(2,517)	(2,508)	(3,024)	(3,314)	(2,713)
22,371	22,005	22,362	25,305	28,224	30,495	29,798
(10,753)	(1,607)	(2,133)	(7,753)	23	2,445	(13,433)
(6,132)	(2,488)	(3,133) 5,642	4,223 9,244	(3,593)	(3,259)	(5,503)
3,171 (1,450)	3,148 (484)	(620)	(280)	6,639 (252)	(3,085)	(6,477)
5,359	1,791	242	(200)	(232)	_	
(9,072)	(9,565)	(11,728)	(16,380)	(15,659)	(10,889)	(13,258)
	_	_		(2,127)	_	_
432	747	526	_	_	_	_
	_			_		
8,355	8,526	(8,742)	2,123	6,841	3,134	6,786
175,965 7,644	166,031 6,869	143,385 7,926	145,302 12,626	172,097 10,735	170,342 13,573	152,753 13,229
(22,881)	(21,765)	(21,974)	(25,131)	(28,211)	(30,554)	(30,224)
(9,492)	(25,244)	(9,552)	(10,687)	(6,807)	(7,232)	(20,317)
151.236	125,891	119,786	122,110	147,813	146,130	115,440
	•	•		•	•	
7,068	3,102	6,343				
(115,827)	(133,711)	(165,201)	(176,982)	(148,404)	(140,840)	(108,149)
2,453	2,285		_	_		— (122) —
(14,184)	(6,068)	(1,347)	(1,149)	(4,429)	(2,537)	(18,005)
5,235	4,915	7,938	6,460	4,053	15,960	2,577
<del>_</del> _		<del>_</del>				<del></del> _
_	_	_	_	_	_	_
	1,425	_		1,665		
(9,419)	(8,802)	(18,101)	(5,704)	4,150	(4,123)	(14,086)
(124,675)	(136,852)	(170,369)	(177,375)	(142,964)	(131,541)	(137,663)
79,726		39,877	79,740	39,858		79,702
(88,000)	(35,000)	(20,000)	(63,599)	(85,298)	(60,999)	(90,000)
49,036 (53,988)	176,745 (127,173)	207,887 (146,048)	241,625 (158,518)	189,320 (120,062)	96,697 (110,783)	83,762 (69,108)
84,880	103,760	108,500	97,221	104,942	100,944	87,663
(80,680)	(103,070)	(110,038)	(95,374)	(95,582)	(102,994)	(90,194)
392,965	359,968	326,969	83,996		2,999	15,000
(406,000)	(359,000)	(336,000)	(88,000)	_	(3,000)	(15,000)
	_	_		59,359		
<u> </u>						
<u> </u>				 59.740		
				59,740		
_	_	_	_	_	_	42,363
(10,503)	(10,502)	(10,501)	(10,504)	(10,505)	(12,811)	(12,811)
(8)	(196)	_	_		_	
3,398	3,764	856	1,709	2,148	1,315	(916)
(29,172)	9,296	61,502	88,295	143,920	(88,632)	30,461
285	(585)	2,615	3,297	2,446	(2,446)	267
(2,326)	(2,248)	13,535	36,328	151,216	(76,490)	8,505
40,329	38,002	35,359	48,894	85,223	236,439	159,949
	(394)		_	_		
38,002	35,359	48,894	85,223	236,439	159,949	168,454
		-,				



Segment Information	2008/3	2009/3	2010/3	
Sales to External Customers				
Electric Power Business	531,764	648,362	530,289	
Electric Power-Related Business	24,185	23,488	24,095	
Overseas Business	_	_	1,576	
Other Businesses	31,831	33,085	28,522	
Consolidated	587,780	704,936	584,484	
Operating Income				
Electric Power Business	39,897	44,610	38,294	
Electric Power-Related Business	10,403	11,569	11,207	
Other Business	900	360	(301)	
Adjustments	(478)	567	(260)	
Consolidated	50,724	57,108	48,939	
Ordinary Income				
Electric Power Business	_	_	22,320	
Electric Power-Related Business	_	_	11,521	
Overseas Business	_	_	6,511	
Other Business	_	_	1,614	
Adjustments		_	(273)	
Consolidated		_	41,694	
Depreciation and Amortization				
Electric Power Business	113,468	113,112	119,241	
Electric Power-Related Business	3,573	3,406	2,839	
Overseas Business	_	_	48	
Other Business	1,061	1,174	1,349	
Adjustments	(3,082)	(3,023)	(3,166)	
Consolidated	115,021	114,669	120,313	
Increase in the Tangible and Intangible Noncurrent Assets				
Electric Power Business	113,566	154,096	106,737	
Electric Power-Related Business	7,125	13,170	2,507	
Overseas Business		_	5,727	
Other Business	5,457	4,897	344	
Adjustments	(4,093)	(36)	(3,084)	
Consolidated	122,056	172,128	112,233	

Note: From the year ended March 31, 2007, the segment that had been called "Other Business" was divided into "Electric Power-Related Business" and "Other Business."

From the year ended March 31, 2011, overseas business that had been included under "Other Business" was made into a separate segment. For year-on-year comparison

purposes, it is also presented separately in the year ended March 31, 2010.

From the year ended March 31, 2011, segment income is stated in terms of ordinary income rather than operating income as before. For year-on-year comparison purposes, ordinary income is also stated in the year ended March 31, 2010.

Accounting policies were partially changed from the year ended March 31, 2017 and the figures for the year ended March 31, 2016 reflect retroactive application of the

<b>2017</b> /3	2016/3	2015/3	2014/3	2013/3	2012/3	2011/3
(A.4:III: 6 )						
(Millions of yen)						
538,558	570,837	588,184	609,080	605,338	609,775	584,436
34,004	31,973	30,467	29,944	26,599	23,133	26,294
149,888	155,952	108,916	42,834	1,647	2,005	1,881
21,950	21,309	23,059	24,975	22,471	19,686	23,363
744,402	780,072	750,627	706,835	656,056	654,600	635,975
_	_	_	_	_	_	_
_	_	_	_	_	_	_
_	_	_	_	_	_	_
_	_	_	_	_		_
_						
22,212	32,239	33,386	29,088	31,088	22,290	41,832
14,244	14,462	8,970	9,626	9,099	8,373	10,425
31,229	11,483	15,990	52	3,907	3,499	5,047
1,376	810	611	956	986	(3)	(1,517)
(1,912)	(456)	392	353	(256)	2,460	533
67,150	58,538	59,350	40,077	44,825	36,619	56,322
54,650	77,628	81,924	85,173	93,163	104,344	110,179
5,975	6,252	5,776	5,308	4,498	3,514	3,362
16,448	12,833	7,820	3,299	84	55	115
314	422	468	512	492	521	1,231
(1,728)	(2,553)	(2,680)	(2,884)	(2,984)	(3,164)	(3,244)
75,660	94,582	93,309	91,408	95,254	105,271	111,644
107,841	119,176	67,038	94,307	69,390	68,286	70,742
2,153	2,820	7,071	4,889	46,713	7,119	5,236
1,358	11,472	75,158	95,815	60,175	62,548	18,091
553	(7.450)	(2,602)	<b>546</b>	(1.667)	340	(1.594)
(6,070)	(7,450)	(2,692)	(532)	(1,667)	(570)	(1,584)
105,837	126,320	146,894	195,026	175,106	137,725	93,128



### **10-Year Non-Consolidated Financial Data**

Non-Consolidated Balance Sheets	2008/3	2009/3	2010/3	
Assets				
Noncurrent Assets	1,819,393	1,796,175	1,808,678	
Electric Utility Plant and Equipment	1,254,172	1,220,808	1,215,919	
Hydroelectric Power Production Facilities	441,129	428,270	413,221	
Thermal Power Production Facilities	510,443	469,618	489,556	
Renewable Power Production Facilities	_	_	2,084	
Transmission Facilities	233,026	221,274	211,312	
Transformation Facilities	35,559	37,929	36,360	
Communication Facilities	10,125	10,384	10,121	
General Facilities	23,887	53,331	53,261	
Incidental Business Facilities	2,504	2,321	2,070	
Non-Operating Facilities	607	461	248	
Construction in Progress	326,336	313,664	287,204	
Construction in Progress	326,175	313,542	286,540	
Retirement in Progress	161	121	664	
Nuclear Fuel	10,310	27,650	38,688	
Nuclear Fuel in Processing	10,310	27,650	38,688	
Investments and Other Assets	225,462	231,268	264,546	
Long-Term Investments	72,069	46,787	72,083	
Long-Term Investments for Subsidiaries and Affiliates	117,195	143,118	152,399	
Long-Term Prepaid Expenses	3,256	2,164	1,824	
Deferred Tax Assets	33,515	40,084	39,079	
Allowance for Doubtful Accounts	(574)	(886)	(840)	
Current Assets	90,896	114,416	93,826	
Cash and Deposits	4,051	4,973	5,151	
Accounts Receivable –Trade	39,036	44,178	39,848	
Other Accounts Receivable	7,198	5,186	4,870	
Short-Term Investments	_	22	_	
Supplies	21,800	38,414	19,087	
Advance Payments	_	_	_	
Prepaid Expenses	1,355	1,002	1,219	
Short-Term Receivables from Subsidiaries and Affiliates	5,793	4,880	9,516	
Deferred Tax Assets	3,482	4,150	2,993	
Other Current Assets	8,198	11,622	11,138	
Allowance for Doubtful Accounts	(20)	(14)		
Total Assets	1,910,290	1,910,592	1,902,504	

Notes: 1. Owing to the abolition of the Electric Power Development Promotion Law during the year ended March 31, 2004, "accounts receivable-overseas technical services" and "overseas technical service charge in advance" are now recorded as "other current assets" and "other current liabilities," in accordance with electric utility accounting regu-

Corresponding to the revision of electric utility accounting regulations, the disclosure of "Renewable Power Production Utilities" began and a geothermal power production facility was booked as "Renewable Power Production Facilities" from the year ended March 31, 2010.
 Accounting policies were partially changed from the year ended March 31, 2017 and the figures for the year ended March 31, 2016 reflect retroactive application of the

<b>2017</b> /3	2016/3	2015/3	2014/3	2013/3	2012/3	2011/3
(Millions of yen)						
1,892,648	1,820,204	1,795,979	1,780,429	1,749,201	1,728,454	1,768,302
932,819	931,795	965,328	1,003,628	1,045,889	1,095,654	1,159,857
357,508	353,685	359,001	365,343	372,980	384,125	399,744
318,961	320,428	341,313	367,935	394,071	429,797	462,070
939	1,061	2,523	1,541	1,533	1,526	1,765
160,596	164,220	171,471	178,925	188,695	189,304	200,373
30,988	31,132	31,424	31,645	31,762	32,944	35,721
8,815	9,039	9,095	9,257	9,308	9,767	10,274
55,009	52,227	50,497	48,979	47,537	48,187	49,907
2,199	1,944	2,088	2,213	1,980	2,186	2,297
313	331	406	857	798	260	335
483,067	438,730	384,957	367,748	331,810	315,318	295,682
482,143	438,592	384,859	367,563	331,120	314,737	295,449
923	138	98	185	690	580	233
73,682	73,447	71,467	69,216	59,769	54,157	46,693
73,682	73,447	71,467	69,216	59,769	54,157	46,693
400,565	373,953	371,731	336,763	308,954	260,877	263,435
63,824	61,773	83,250	70,612	67,029	60,522	62,572
277,179	265,759	252,708	236,195	212,363	169,582	164,876
36,609	25,553	16,718	9,597	3,760	1,548	2,480
22,953	20,866	19,203	24,041	31,004	35,411	38,992
_	_	(149)	(3,682)	(5,204)	(6,188)	(5,485)
168,232	165,044	262,629	146,302	121,090	115,806	116,528
5,169	3,969	4,380	3,934	4,440	4,295	4,362
43,488	26,789	32,145	46,228	48,758	50,745	49,264
2,838	4,636	649	782	3,618	507	4,845
51,000	72,399	167,398	35,000	_	_	_
36,360	31,758	30,048	28,210	33,083	31,565	28,529
_	71	_	_	_	_	_
2,752	2,140	2,385	2,370	2,405	2,388	1,672
5,381	5,293	6,197	11,079	7,808	6,876	11,637
2,305	3,217	3,885	5,289	4,917	4,599	3,732
18,936	14,767	15,539	13,405	16,166	14,895	12,604
				(108)	(65)	(121)
2,060,881	1,985,248	2,058,609	1,926,731	1,870,291	1,844,261	1,884,830



	2008/3	2009/3	2010/3	
Liabilities				
Noncurrent Liabilities	1,241,004	1,256,467	1,302,695	
Bonds Payable	602,903	717,867	689,883	
Long-Term Loans Payable	599,350	481,577	550,955	
Long-Term Accrued Liabilities	3	2	1	
Lease Obligations	_	133	218	
Long-Term Debt to Subsidiaries and Associates	2,767	3,073	4,887	
Provision for Retirement Benefits	28,585	41,439	46,351	
Assets Retirement Obligations	_	_	_	
Other Noncurrent Liabilities	7,395	12,373	10,396	
Current Liabilities	262,882	316,383	252,974	
Current Portion of Noncurrent Liabilities	98,995	117,815	136,703	
Short-Term Loans Payable	6,000	9,000	12,750	
Commercial Papers	88,949	109,971	24,998	
Accounts Payable –Trade	3,649	1,220	4,452	
Accounts Payable –Other	4,771	8,040	9,892	
Accrued Expenses	9,598	11,349	10,407	
Accrued Taxes	8,920	13,539	3,790	
Deposits Received	279	261	278	
Short-Term Debt to Subsidiaries and Associates	39,932	42,331	47,298	
Other Advances	444	938	583	
Other Current Liabilities	1,341	1,916	1,818	
Reserves under the Special Laws	1,560	1,146	734	
Reserve for Fluctuation in Water Levels	1,560	1,146	734	
Total Liabilities	1,505,447	1,573,998	1,556,404	
Net Assets				
Shareholders' Equity	403,672	338,012	343,879	
Capital Stock	152,449	152,449	152,449	
Capital Surplus	81,852	81,852	81,852	
Legal Capital Surplus	81,852	81,852	81,852	
Retained Earnings	169,436	166,971	172,839	
Legal Retained Earnings	6,029	6,029	6,029	
Other Retained Earnings	163,406	160,941	166,810	
Reserve for Special Disaster	47	50	53	
Exchange-Fluctuation Preparation Reserve	1,960	1,960	1,960	
General Reserve	132,861	137,861	137,861	
Retained Earnings Brought Forward	28,538	21,070	26,935	
Treasury Stock	(64)	(63,260)	(63,262)	
Valuation and Translation Adjustments	1,169	(1,417)	2,220	
Valuation Difference on Available-for-Sale Securities	1,068	(1,214)	2,634	
Deferred Gains or Losses on Hedges	101	(203)	(414)	
Total Net Assets	404,842	336,594	346,099	
Total Liabilities and Net Assets	1,910,290	1,910,592	1,902,504	

Note: Accounting policies were partially changed from the year ended March 31, 2017 and the figures for the year ended March 31, 2016 reflect retroactive application of the change.

<b>2017</b> /3	2016/3	2015/3	2014/3	2013/3	2012/3	2011/3
(Millions of yen)						
1,156,280	1,184,707	1,245,889	1,226,516	1,206,654	1,211,719	1,257,747
494,991	575,079	666,061	691,346	694,930	714,914	734,898
605,486	562,520	524,557	479,549	438,228	429,373	461,256
269	269	271	269	_	_	0
133	188	249	342	374	392	314
1,805	1,425	6,346	4,932	4,999	5,192	5,709
47,395	38,548	41,945	42,089	47,155	46,053	45,259
1,646	1,604	214	202	189	175	158
4,552	5,070	6,242	7,784	20,777	15,617	10,149
342,408	282,557	300,443	325,406	304,261	285,725	277,226
190,745	145,540	157,661	201,395	192,821	163,166	159,747
16,650	16,250	18,350	18,350	18,350	18,350	17,350
_	_	_	_	3,999	12,999	11,999
6,141	1,731	3,341	1,839	2,375	2,194	5,055
10,560	7,587	11,996	8,362	2,843	3,094	2,970
14,391	10,016	10,801	9,519	10,276	10,191	9,760
7,362	9,319	7,972	4,919	7,201	8,877	18,821
294	323	315	308	474	454	282
92,253	87,863	84,544	74,979	59,093	60,697	47,634
3,067	786	602	694	741	666	1,034
941	3,137	4,857	5,037	6,081	5,032	2,569
	116		119	425	777	777
	116		119	425	777	777
1,498,688	1,467,381	1,546,332	1,552,042	1,511,341	1,498,222	1,535,751
545,629	506,807	494,713	366,524	354,914	346,824	348,159
180,502	180,502	180,502	152,449	152,449	152,449	152,449
109,904	109,904	109,904	81,852	81,852	81,852	81,852
109,904	109,904	109,904	81,852	81,852	81,852	81,852
255,228	216,405	204,309	195,491	183,878	175,787	177,121
6,029	6,029	6,029	6,029	6,029	6,029	6,029
249,198	210,375	198,280	189,462	177,848	169,758	171,092
69	66	65	82	77	70	57
1,960	1,960	1,960	1,960	1,960	1,960	1,960
182,861	162,861	152,861	152,861	147,861	147,861	142,861
64,308	45,488	43,393	34,558	27,950	19,866	26,213
(5)	(4)	(2)	(63,268)	(63,265)	(63,264)	(63,263)
16,562	11,059	17,562	8,164	4,035	(785)	919
14,276	11,178	18,663	8,154	4,281	(1,158)	(479)
2,286	(118)	(1,101)	9	(245)	373	1,399
562,192	517,867	512,276	374,689	358,950	346,039	349,079
2,060,881	1,985,248	2,058,609	1,926,731	1,870,291	1,844,261	1,884,830



Non-Consolidated Statements of Income	2008/3	2009/3	2010/3	
Operating Revenue	529,250	645,850	530,436	
Electric Utility Operating Revenue	517,318	631,452	518,682	
Sold Power to Other Suppliers	457,292	571,282	458,688	
Transmission Revenue	54,934	55,414	54,402	
Other Electricity Revenue	5,090	4,755	5,591	
Incidental Business Operating Revenue	11,932	14,398	11,753	
Operating Expenses	489,363	601,122	489,531	
Electric Utility Operating Expenses	478,579	588,224	479,085	
Hydroelectric Power Production Expenses	61,114	68,281	60,904	
Thermal Power Production Expenses	312,292	402,159	319,569	
Renewable Power Production Expenses	312,292	402,139	802	
Purchased Power from Other Suppliers	 1,214	 80	15	
	· · · · · · · · · · · · · · · · · · ·			
Transmission Expenses	28,680	28,475	27,523	
Transformation Expenses	6,621	7,020	6,785	
Selling Expenses	1,546	1,307	1,225	
Communicating Expenses	6,000	6,242	6,275	
General and Administrative Expenses	54,353	66,407	49,349	
Expenses for Third Party's Power Transmission Service		0.250		
Enterprise Tax	6,756	8,250	6,634	
Incidental Business Operating Expenses	10,783	12,897	10,446	
Operating Income	39,887	44,728	40,904	
Non-Operating Income	9,844	6,617	6,463	
Financial Revenue	5,332	4,933	3,547	
Dividends Income	4,275	3,775	2,346	
Interest Income	1,057	1,158	1,200	
Non-Operating Revenue	4,512	1,683	2,916	
Gain on Sales of Noncurrent Assets	1,067	5	600	
Miscellaneous Revenue	3,444	1,678	2,316	
Non-Operating Expenses	27,648	28,950	23,576	
Financial Expenses	21,937	22,294	22,175	
Interest Expenses	21,648	21,915	21,967	
Share Issuance Cost				
Bond Issue Cost	288	379	207	
Non-Operating Expenses	5,710	6,655	1,400	
Loss on Sales of Noncurrent Assets	2	32		
Miscellaneous Loss	5,708	6,622	1,400	
Total Ordinary Revenue	539,095	652,468	536,899	
Total Ordinary Expenses	517,011	630,072	513,107	
Ordinary Income	22,083	22,395	23,791	
Provision or Reversal of Reserve for Fluctuation				
in Water Levels	(595)	(413)	(411)	
Provision of Reserve for Fluctuation in Water Levels			<del></del>	
Reversal of Reserve for Fluctuation in Water Levels	(595)	(413)	(411)	
Extraordinary Income		14,472		
Extraordinary Loss	_	19,647	<u> </u>	
Profit before Income Taxes	22,678	17,635	24,203	
Income Taxes–Current	11,338	13,389	6,660	
Income Taxes–Deferred	(3,421)	(5,781)	1,170	
Total Income Taxes	7,917	7,608	7,831	
Profit	14,761	10,026	16,372	

Notes:1. Corresponding to the revision of electric utility accounting regulations, the disclosure of "operating revenues" and "operating expenses" began and "electricity financial revenues and expenses" were renamed as "financial revenue and expenses," which became included under "non-operating income and expenses" from the year ended

Also "income from and expenses on overseas technical services" became included under "non-operating income and expenses."

<sup>2.</sup> Owing to the abolition of the Electric Power Development Promotion Law during the year ended March 31, 2004, incidental business revenues and expenses that formerly had been recorded in "income from and expenses on overseas technical services," "other electricity revenues" and "general and administrative expenses" were renamed "incidental business revenues and expenses" and became included under "operating revenues and expenses" in accordance with electric utility accounting regulations.

<sup>3.</sup> Corresponding to the revision of electric utility accounting regulations, the disclosure of "Renewable Power Production Expenses" began and expenses related to a geothermal power production facility was booked as "Renewable Power Production Expenses" from the year ended March 31, 2010.

<sup>4.</sup> Accounting policies were partially changed from the year ended March 31, 2017 and the figures for the year ended March 31, 2016 reflect retroactive application of the change.

2011/	3 2012/3	2013/3	2014/3	2015/3	2016/3	2017/3
2011/	2012/3	2013/3	201-113	2013/3	2010/3	(Millions of yen)
583,213	599,973	586,993	582,861	557,943	552,341	522,460
573,878		577,284	572,937	548,580	543,019	510,909
514,640		520,620	516,701	495,313	490,235	457,953
54,343		52,632	52,182	49,281	48,991	49,021
4,894		4,031	4,054	3,985	3,792	3,933
9,335		9,708	9,923	9,363	9,322	11,551
520,569		543,659	542,396	513,387	510,770	494,829
513,395		534,765	533,444	504,946	502,326	484,288
60,005		60,762	60,633	62,171	62,715	57,093
358,156	381,201	377,701	383,857	359,690	344,062	322,317
976	5 2,274	2,036	926	367	2,183	645
1,388	3,428	256	520	10	14	4,283
26,943	3 29,031	26,586	27,054	26,459	25,848	23,560
6,453	5,968	6,623	6,218	6,317	6,338	5,751
1,223	1,482	2,570	3,197	1,244	1,362	1,209
6,480	6,360	5,815	4,714	4,853	4,671	4,301
44,466	5 45,429	45,040	39,018	36,828	48,135	58,071
	_	<del>_</del>	<del></del>	<del>_</del>	<del>_</del>	478
7,300	7,508	7,371	7,301	7,001	6,993	6,577
7,174	8,617	8,894	8,952	8,441	8,444	10,540
62,644	42,344	43,333	40,464	44,555	41,570	27,630
6,348	9,089	8,304	14,773	8,599	18,319	45,458
4,649	6,726	6,063	11,700	6,626	17,079	43,456
3,403	5,401	4,395	10,275	5,250	15,825	42,543
1,246		1,668	1,425	1,375	1,253	913
1,699		2,241	3,072	1,973	1,240	2,002
82		109	89	3	10	2
1,616		2,131	2,983	1,969	1,230	1,999
25,800		22,799	24,177	24,217	19,715	16,619
21,627		20,707	20,348	19,531	17,874	15,739
21,353	3 20,525	20,585	20,088	19,115	17,874	15,442
	<del>-</del>			274	<del>-</del>	
273	· · · · · · · · · · · · · · · · · · ·	122	259	141	_	297
4,173		2,091	3,829	4,685	1,840	879
625		630	631	55	4	15
3,547		1,461	3,197	4,629	1,835	863
589,561		595,298	597,635	566,543	570,661	567,919
546,370		566,459	566,574	537,605	530,486	511,449
43,191	I 25,677	28,839	31,060	28,938	40,174	56,470
4.5		(254)	(205)	(440)	446	
42		(351)	(306)	(119)	116	
42			(206)	(110)	116	
4 (2)	- <u>-</u>	(351)	(306)	(119)	<del>-</del>	
1,635 13,757		<del>-</del>	<u></u>	2,280	<del>-</del>	
31,027		29,190	21 267	21 227	40.059	 56,470
16,395		<b>29,190</b> 7,999	<b>31,367</b> 4,375	<b>31,337</b> 3,444	<b>40,058</b> 6,267	7,691
(153		2,596	4,874	5,450	2,970	(2,773)
16,242		10,595	9,250	8,895	9,238	4,917
14,785		18,594	22,117	22,442	30,820	51,552
1-7,70	5,105	10,554	22,117	22,772	30,020	31,332



### **Major Group Companies**

(As of March 31, 2017)

Company Name	Main Businesses	Equity Stake (%)	(1)	(2)
Bay Side Energy Co., Ltd. Mihama Seaside Power Co., Ltd. ITOIGAWA POWER Inc. J-Wind Co., Ltd. Japan Clean Energy Development Co., Ltd. Yurihonjo Wind Power Co., Ltd. Minami Kyushu Wind Power Co., Ltd. J-Wind OOMA Co., Ltd.		400.0		
Bay Side Energy Co., Ltd.	Thermal power business	100.0	0	
Mihama Seaside Power Co., Ltd.	Thermal power business Thermal power business	100.0	0	0
J-Wind Co., Ltd.	Wind power business	64.0 100.0	0	0
Japan Clean Energy Development Co., Ltd.	Wind power business Wind power business	100.0	0	-
Yurihonjo Wind Power Co., Ltd.	Wind power business Wind power business	100.0	-0	<del>-</del>
Minami Kyushu Wind Power Co., Ltd.	Wind power business  Wind power business	98.8	-	<del>-</del>
J-Wind OOMA Co., Ltd.	Wind power business  Wind power business	100.0	0	<del>-</del>
J-Wind NIKAHO Co., Ltd.	Wind power business  Wind power business	100.0		
J-Wind KUZUMAKI Co., Ltd.	Wind power business  Wind power business	100.0		
J-Wind SETANA Co., Ltd.	Wind power business  Wind power business	90.0		
Nagasaki-Shikamachi Wind Power Co., Ltd.	Wind power business  Wind power business	70.0	0	0
Nikaho-Kogen Wind Power Co., Ltd.	Wind power business  Wind power business	100.0		$\overline{}$
Electric Power-Related Business	willia power busiless	100.0		
JPec Co., Ltd.	Construction, technical development, design, consulting, maintenance, and research for thermal and nuclear power plants; unloading and transporting of coal at thermal power plants; sale of fly ash; shipping of coal for thermal power plants; research and planning of environmental conservation	100.0	0	
JPHYTECH Co., Ltd.	Construction, technical development, design, consulting, maintenance, and research for hydroelectric power plants, substations, and transmission lines; surveying of and compensation for construction sites; civil engineering, construction management, and construction services	100.0	0	
JP Business Service Corporation	Operation of welfare facilities; facility maintenance; business process outsourcing; development of computer software	100.0	0	
KEC Corporation	Construction and maintenance of electronic and communications facilities	100.0	0	
JP Design Co., Ltd.	Design, management, and research for electric power facilities and other facilities and construction consulting	100.0	0	
J-POWER RESOURCES Co., Ltd.	Import, sales, and transportation of coal	100.0	0	
J-POWER AUSTRALIA PTY. LTD.	Investments in coal mines in Australia	100.0		
JPOWER GENEX CAPITAL Co., Ltd.	Management of IPP projects	100.0		
J-Wind Service Co., Ltd.	Maintenance and operation of wind power plants	100.0	0	
J-POWER EnTech Co., Inc.	Engineering services for atmospheric and water pollutant removal equipment	100.0	0	
Miyazaki Wood Pellet Co., Ltd.	Operation of manufacturing facilities of wood pellets and procurement of forest offcut	98.3	0	
JM Activated Coke, Inc.	Manufacturing, sales, and marketing of activated coke	90.0	0	
EPDC CoalTech and Marine Co., Ltd.	Marine transportation of ash and fly ash	100.0 (100.0)	*	
and 11 companies  Overseas Business				
J-Power Investment Netherlands B.V.	Management of investments	100.0		
J-POWER Holdings (Thailand) Co., Ltd.	Management of investments	100.0 (100.0)		
J-POWER Generation (Thailand) Co., Ltd.	Management of investments, research and development of projects	100.0 (100.0)		
Gulf JP Co., Ltd.	Management of investments	60.0 (60.0)		
Gulf JP NS Co., Ltd.	Thermal power business	60.0		
Gulf JP UT Co., Ltd.	Thermal power business	(60.0)		0
· · · · · · · · · · · · · · · · · · ·		(60.0) 60.0		
Gulf JP NNK Co., Ltd.	Thermal power business	(60.0) 60.0		<u> </u>
Gulf JP CRN Co., Ltd.	Thermal power business	(60.0)		O —
Gulf JP NK2 Co., Ltd.	Thermal power business	60.0 (60.0)		0
Gulf JP TLC Co., Ltd.	Thermal power business	60.0 (60.0)		0
Gulf JP KP1 Co., Ltd.	Thermal power business	60.0 (60.0)		0
Gulf JP KP2 Co., Ltd.	Thermal power business	60.0 (60.0)		0
Gulf JP NLL Co., Ltd.	Thermal power business	45.0 (45.0)		0
J-POWER North America Holdings Co., Ltd.	Management of investments	100.0		
J-POWER USA Investment Co., Ltd.	Management of investments	100.0 (100.0)		
J-POWER USA Development Co., Ltd.	Management of investments, research and development of projects	100.0 (100.0)		
		(100.0)		
J-POWER Consulting (China) Co., Ltd.	Management of investments, research and development of projects	100.0		

<sup>(1) 27</sup> domestic consolidated subsidiaries which are coverd in the environment-related data calculation Note: In addition to the companies shown in the lists, coverage includes JP Enterprise Corporation (100% equity stake by J-POWER) and Biocoal Yokohama-South CO., LTD. (60% equity stake by J-POWER).

<sup>\*</sup>Data for EPDC CoalTech and Marine Co., Ltd., are included as a portion of JPec Co., Ltd., data.

<sup>(2) 12</sup> domestic electric power business companies and 32 overseas business companies which are coverd in the calculation of CO<sub>2</sub> emissions for domestic and overseas power generation

	Company Name	Main Businesses	Equity Stake (%)	(1)
3 I	Other Businesses		100.0	
<u> </u>	Kaihatsu Hiryou Co., Ltd.	Production and sales of fertilizer using ash	100.0	0
	Japan Network Engineering Co., Ltd.	Telecommunications; operation and maintenance of telecommunications facilities	100.0	0
<u> </u>	Omuta Plant Service Co., Ltd. Biocoal Osaka-Hirano Co., Ltd.	Operation and maintenance of a waste-fueled power generation plant	100.0	0
ŀ	Green Coal Saikai Co., Ltd.	Construction and operation of a sewage sludge-based fuel manufacturing facility  Operation of an ordinary waste-based fuel manufacturing facility	60.0	0
ŀ	and 1 company	Operation of an ordinary waste-based rule manufacturing facility	00.0	
i	Electric Power Business			
ľ	Kashima Power Co., Ltd.	Thermal power business	50.0	
ľ	TOSA POWER Inc.	Thermal power business	45.0	
ľ	GENEX Co., Ltd.	Thermal power business	40.0	
ŀ	Osaki CoolGen Corporation	Large-scale demonstration trials of oxygen-blown IGCC and CO <sub>2</sub> separation and capture	(40.0) 50.0	
ľ	Yuzawa Geothermal Power Generation	Geothermal power business	50.0	
ŀ	Corporation Overseas Business	·		
ľ			49.0	
L	Gulf Electric Public Co., Ltd.	Management of investments	(49.0)	
ı	Gulf Power Generation Co., Ltd.	Thermal power business	49.0 (49.0)	
ŀ	None Khan Coganavation Co. 1td	Thermal power business	49.0	
ŀ	Nong Khae Cogeneration Co., Ltd.	mermai power business	(49.0)	
	Samutprakarn Cogeneration Co., Ltd.	Thermal power business	49.0 (49.0)	
ľ	Gulf Cogeneration Co., Ltd.	Thermal power business	49.0	
ŀ	duii Cogeneration Co., Etc.	memai power business	(49.0) 49.0	
ı	Gulf Yala Green Co., Ltd.	Thermal power business	(49.0)	
	EGCO Green Energy Co., Ltd.	Management of investments	26.0	
L	Edeo dreen Energy Co., Etd.		(26.0)	
ı	EGCO Cogeneration Co., Ltd.	Thermal power business	20.0 (20.0)	
ľ	Roi-Et Green Co., Ltd.	Thermal power business	_	
ŀ	<u> </u>	·	[95.0] 50.0	
L	J-POWER USA Generation, L.P.	Management of investments	(50.0)	
	Birchwood Power Partners, L.P.	Thermal power business	50.0 (50.0)	
ľ	Green Country Energy, LLC	Thermal power business	_	
ŀ		<u> </u>	[100.0]	
l	Pinelawn Power LLC	Thermal power business	[100.0]	
	Equus Power I, L.P.	Thermal power business	 [100.0]	
Ī	Edgewood Energy, LLC	Thermal power business		
ŀ	Shoreham Energy, LLC	Thermal power business	[100.0]	
ŀ	Shorenam Energy, LEC	mermai power business	[100.0]	
	Orange Grove Energy, L.P.	Thermal power business	[100.0]	
	Elwood Energy, LLC	Thermal power business	— [100.0]	
ľ	Tenaska Virginia Partners, L.P.	Thermal power business	_	
ŀ			[30.0]	
L	Tenaska Frontier Partners, Ltd.	Thermal power business	[25.0]	
-	JM Energy Co., Ltd.	Management of investments	50.0	
	Shaanxi Hanjiang Investment & Development Co., Ltd.	Hydroelectric power business	27.0	
	ShanXi TianShi Power Generation Co., Ltd.	Thermal power business	24.0	
	China Resources Power (Hezhou) Co., Ltd.	Thermal power business	 [100.0]	
ŀ	Chiahui Power Corporation	Thermal power business	40.0	
ŀ	<u> </u>	<u> </u>	(40.0)	
	PT. BHIMASENA POWER INDONESIA	Thermal power business	34.0	
	CBK Netherlands Holdings B.V.	Management of investments	50.0 (50.0)	
	CBK Power Co., Ltd.	Hydroelectric power business	_	
ŀ	· · · · · · · · · · · · · · · · · · ·		[100.0] 50.0	
	Zajaczkowo Windfarm Sp. z o.o.	Wind power business	(50.0)	

Notes: 1. The percentages in parentheses present indirect holding ratios and are included in the percentages above. Those shown in brackets are the ratios held by closely related parties or parties in agreement and excluded from the percentages above.

2. JPec Co., Ltd., J-POWER RESOURCES Co., Ltd., J-POWER AUSTRALIA PTY. LTD., J-POWER Holdings (Thailand) Co., Ltd. and Gulf JP Co., Ltd. are specified subsidiaries.

3. As of April 1, 2017, J-Wind Co., Ltd., absorbed and merged Nikaho-Kogen Wind Power Co., Ltd., Japan Clean Energy Development Co., Ltd., and J-Wind OOMA Co., Ltd.



### **Corporate Profile/Stock Information**

(As of March 31, 2017)

Corporate Name Electric Power Development Co., Ltd.

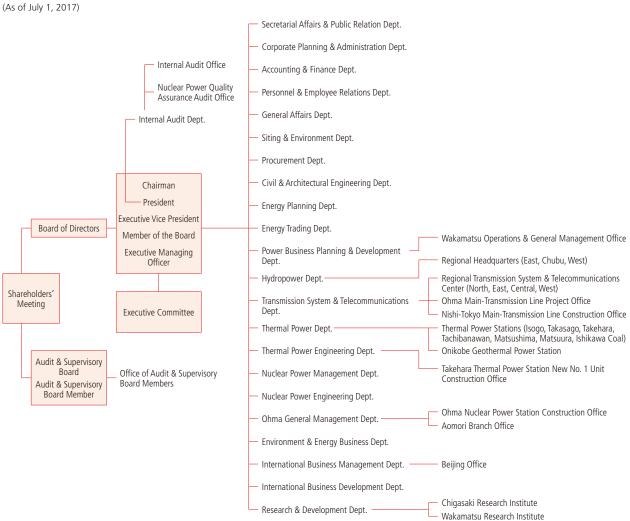
Communication Name J-POWER Date of Establishment Sept. 16, 1952

15-1, Ginza 6-chome, Chuo-ku, Tokyo 104-8165, Japan Headquarters Address

Paid-in Capital ¥180,502,169,192 Number of Shares Authorized 660,000,000 Number of Shares Issued 183,051,100 Number of Shareholders 36,108

Stock Exchange Listing Tokyo Stock Exchange Independent Public Accountants Ernst & Young ShinNihon LLC Transfer Agent Sumitomo Mitsui Trust Bank, Limited

### **Organization Chart**



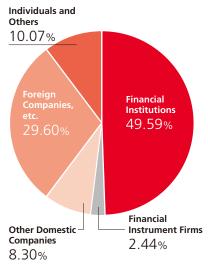
### Major Shareholders (Top 10)

(As of March 31, 2017)

Name or Designation	Number of Shares Held (Thousands of Shares)	Percentage to Total Shares Issued (%)
Japan Trustee Services Bank, Ltd. (Trust Account)	9,749	5.33
Nippon Life Insurance Company	9,152	5.00
The Master Trust Bank of Japan, Ltd. (Trust Account)	7,923	4.33
Mizuho Bank, Ltd.	7,465	4.08
Japan Trustee Services Bank, Ltd. (Trust Account 9)	5,974	3.26
Sumitomo Mitsui Banking Corporation	4,295	2.35
JP MORGAN CHASE BANK 385632	4,243	2.32
J-POWER Employees Shareholding Association	3,744	2.05
The Bank of Tokyo-Mitsubishi UFJ, Ltd.	3,331	1.82
Fukoku Mutual Life Insurance Company	3,025	1.65

<sup>\*</sup> The number of shares held by Fukoku Mutual Life Insurance Company includes its contribution of 600,000 shares to the Retirement Allowance Trust. The holder of said shares, as listed in the Shareholders' Register, is "Japan Trustee Services Bank, Ltd. (Fukoku Mutual Life Insurance Company Retirement Allowance Trust Account re-entrusted by The Sumitomo Mitsui Trust Bank, Limited)."

# Breakdown of Issued Shares by Type of Shareholders —



<sup>\* &</sup>quot;Individuals and Others" includes 1,331 shares of treasury stock.



(Yen) 5,000



1,000 -----

0 -	1 2 3 4 5	6 7 8 9 10 11 12 1 2 3 4 5 6 7	7 8 9 10 11 12 1 2 3 4 5 6 7 8	9 10 11 12 1 2 3 4 5 6 7	8 9 10 11 12 1 2 3 4 5 6
	2013	2014	2015	2016	2017

