

# Status of Addressing the Medium-term Management Plan and Future Initiatives

\* This document is an excerpt of a part of "Summary of FY2017 Earnings Results"  
released on April 27, 2018

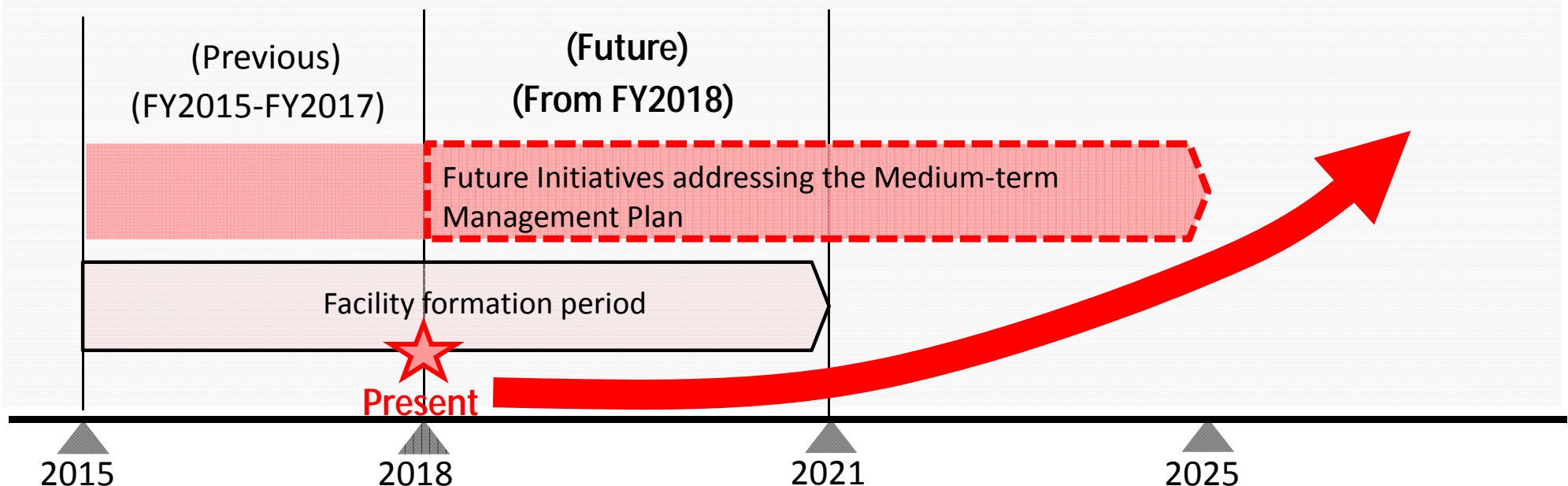
# 1. Status of Addressing the Medium-term Management Plan

- ✓ Through the use of power generation and transmission/transformation facilities throughout the world, and the initiatives to address the Medium-Term Management Plan, the J-POWER Group intends to further increase its corporate value while also contributing to a balanced energy mix and the realization of a low-carbon society.

## Medium-term Management Plan (Released July 31, 2015)

### Key Concepts of the Medium-term Management Plan

- 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
- Growth and Soundness Targets**
- Growth target: J-POWER EBITDA  
(Increase to around 1.5 times the level of FY2014 in FY2025)
  - Soundness target: Interest-bearing debts/ J-POWER EBITDA  
(Improve from level at end of FY2014 by end of FY2025)



# Major Initiatives up to This Point (FY2015 to FY2017)



- ✓ Along with initiatives to maintain and improve the reliability and competitiveness of existing facilities, we are also continuing steadily with new development and technology development globally that will become the platform for further growth.

## (Major Initiatives)

Domestic Business	<ul style="list-style-type: none"> <li>• Construction work proceeded on Takehara Thermal Power Plant New Unit No.1 (coal-fired, start of operation scheduled for 2020), Kashima Power (coal-fired thermal power, start of operation scheduled for 2020)</li> <li>• Replacement of Takasago thermal power suspended (continue operation of existing plant)</li> <li>• Environmental assessment of Yamaguchi Ube Power Project (coal-fired thermal power) being conducted</li> <li>• Started demonstration test for Osaki Coolgen Project (oxygen-blown IGCC) (*1)</li> <li>• Start operation of three onshore wind farms (in addition, construction is underway at three sites and preparations for construction are underway at some sites)</li> <li>• Conducted investigations, etc. toward commercialization of offshore wind power in Kitakyushu City Fukuoka (*2)</li> <li>• Construction work proceeded for the Wasabisawa Geothermal (start of operation scheduled for 2019), and an environmental assessment was conducted for the replacement of Onikobe Geothermal</li> <li>• Started operations with increased capacity through upgrading major equipment (repowering) at existing hydroelectric plants (Akiba No. 1 and No. 2)</li> <li>• Started operations of Konokidani (hydroelectric) in 2016</li> <li>• Power supply to the wholesale market from existing plants</li> <li>• Investigations were conducted for an increase of capacity of the Sakuma Frequency Converter Station (300 MW → 600 MW) and relevant transmission lines</li> <li>• Measures preparing for legal unbundling of transmission business (April 2020)</li> </ul>
Overseas Business	<ul style="list-style-type: none"> <li>• Started operation of U-Thai IPP (Thailand, gas-fired thermal power) in 2015</li> <li>• Proceeded with construction work on Central Java IPP (Indonesia, coal-fired thermal power, start of operations planned in 2020)</li> <li>• Acquired additional equity interest in Elwood (USA, gas-fired thermal power, currently operating)</li> <li>• Acquired equity interest in Westmoreland (USA, gas-fired thermal power, start of operations planned in 2018)</li> <li>• For the overseas business, J-POWER's owned capacity is expected to be about 7.6GW after commencement of operations of projects currently under construction</li> </ul>

\*1: Demonstration test of oxygen-blown IGCC, a high-efficiency combined cycle power generation system that uses a gas turbine driven by the gas produced by gasifying coal and a steam turbine. Phase II of the demonstration in which CO2 separation and capture technology are incorporated is scheduled to start in FY2019.

\*2: The consortium that includes J-POWER was selected in February 2017 as the preferred bidder in the public tender for the installer and operator of the Hibikinada Offshore Wind Farm off the coast of Kita-Kyushu City, and a special purpose company was established in April 2017. We will be conducting surveys on the wind conditions and marine areas aiming at commercialization of offshore wind power generation in Hibikinada.

## Medium-term Management Plan (3-year forecast)

- Growth Indicator: J-POWER EBITDA\*  
3-year average of 185 billion yen/year from FY2015 to FY2017
- Soundness indicator: Interest-bearing debts/ J-POWER EBITDA\*  
Maintain same level as results at end of FY2014 (9.5x) at end of FY2017

Steady progress

- Growth Indicator:  
186.7 billion yen/year (3-year average from FY2015 to FY2017)
- Soundness Indicator:  
8.0x (results at end of FY2017)

\* J-POWER EBITDA= Operating income + Depreciation and amortization + Equity in earnings of affiliates

## Awareness of the business environment surrounding J-POWER Group in the Medium-term Management Plan

Intensifying market competition due to the electricity system reform

Climate change (environmental regulations)

Uncertainty surrounding nuclear power policy

Robust growth in electric power demand centered upon developing countries

Although awareness of the business environment has not changed, circumstances surrounding J-POWER Group are changing greater and faster  
Focusing on the key concepts lifted up in the Medium-term Management Plan (see p. 2), we will achieve growth by responding more flexibly

### Future Initiatives of the J-POWER Group

- ✓ Expansion of renewable energy
- ✓ Challenge for carbon reduction and decarbonization in coal use
- ✓ Promotion of the Ohma Nuclear Power Plant Project, with safety as the major prerequisite
- ✓ Expansion of overseas business
- ✓ Improvement of value of existing facilities

Growth indicator: J-POWER EBITDA \*

210 billion yen or more in FY2020

Soundness indicator: Interest-bearing debts/ J-POWER EBITDA

Maintain same level as results at end of FY2017 (8.0x) at end of FY2020

\* J-POWER EBITDA= Operating income + Depreciation and amortization + Equity in earnings of affiliates

## 2. Future Initiatives of the J-POWER Group

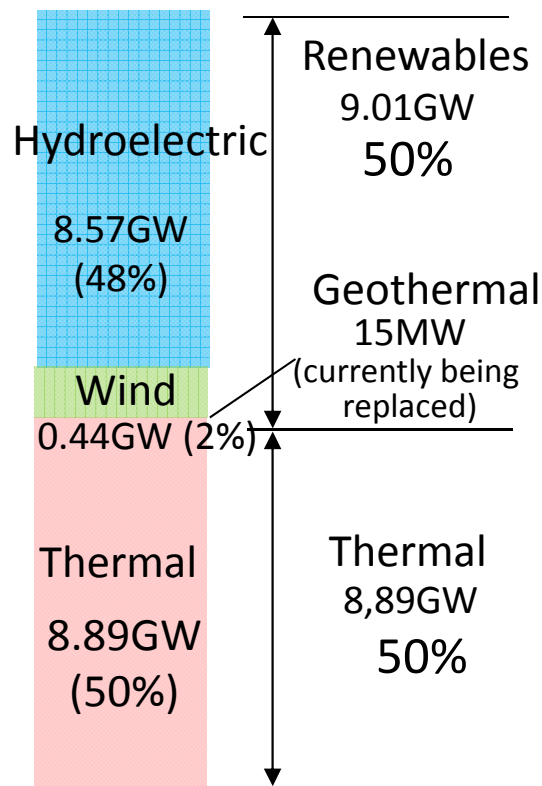
- (1) Expansion of renewable energy
- (2) Challenge for carbon reduction and decarbonization in coal use
- (3) Promotion of the Ohma Nuclear Power Plant Project, with safety as the major prerequisite
- (4) Expansion of overseas business
- (5) Improvement of value of existing facilities



# (1) Expansion of renewable energy

- ✓ With establishing Department of Renewable Energy, contribute to realizing a low-carbon society through renewable energy, as a leader in the business of fully domestically produced and CO2 free energy
  - Take steps to develop renewable energy capacity such as small- to medium- scale hydroelectric, wind, and geothermal power plants
  - Take steps in technology development aiming for expanding renewable energy
  - Take steps toward long-term stable operation of hydroelectric power plants that will contribute greatly to the stable supply of electricity and reduction of CO<sub>2</sub> emissions

## Expand renewable energy capacity



### Hydroelectric

- Increase in capacity through upgrades of major equipment (repowering) at existing plants
- New development of small- to medium- scale hydroelectric plants

### Wind

- New development of onshore wind power and steady replacement of existing facilities
- Proceed with offshore wind business in addition to Hibikinada

### Geothermal

- New development, replacement of existing facilities

### FY2025 Target (Renewable energy)

### **New development with 1GW scale**

**[Hydroelectric 0.3TWh/year increase\*, wind and others 2.5TWh/year increase\*]**

### Carbon reduction and decarbonization for coal use

Biomass mixed combustion, Oxygen-blown IGCC, CCS, etc.

\* Please see page 9 for details

### CO2-free capacity (future)

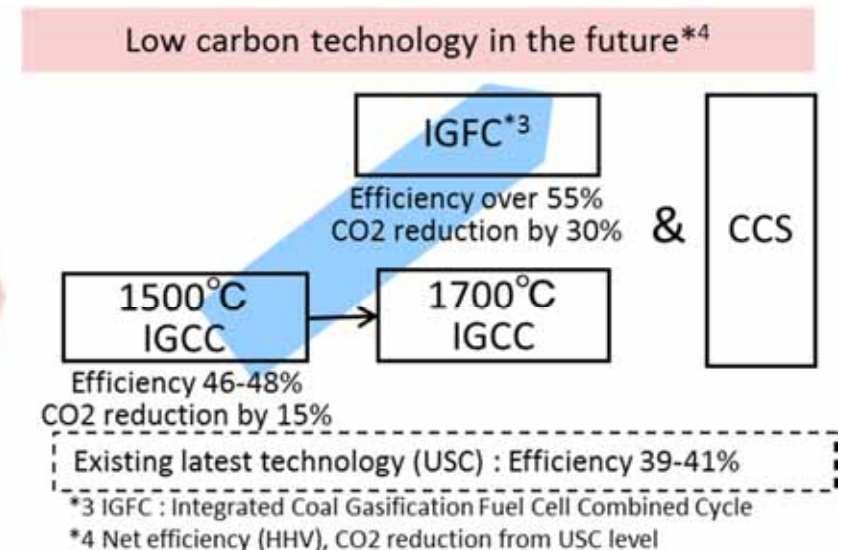
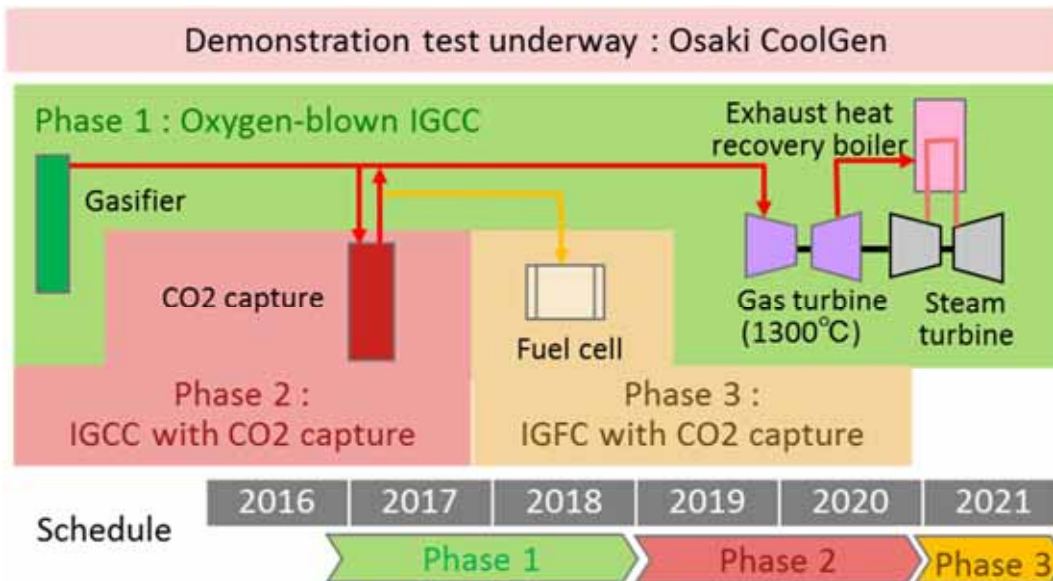
Ohma Nuclear Power Plant

\* Please see page 10 for details

FY2017  
 (As of March 31, 2018)  
 Total 17.9GW

## (2) Challenge for carbon reduction and decarbonization in coal use

- ✓ Contribute to realizing a balanced energy mix through use of coal, a stable energy source that is widely available around the world, while contributing to achieving a low-carbon society through challenges for decarbonization of fossil energy power sources
  - ◆ Develop technologies aiming for zero emissions in the 2050s
    - Commercialization of oxygen-blown IGCC\*<sup>1</sup>
    - R&D of CCS\*<sup>2</sup> (Osaki CoolGen), hydrogen (Brown coal hydrogen demonstration project)
  - ◆ Promote development of high-efficiency coal-fired thermal power
  - ◆ Take steps toward biomass mixed combustion, focusing on wood-based biomass fuel
    - Continue combustion at existing coal-fired power plants
    - Aim for a maximum of 10% mixed combustion in Takehara Thermal Power Plant New Unit No.1 (start of operations planned for 2020)



\*1 Integrated Coal Gasification Combined Cycle

\*2 CO<sub>2</sub> Capture and Storage

### (3) Promotion of the Ohma Nuclear Power Plant Project, with safety as the major prerequisite



- ✓ Through the use of MOX fuel, play a central role in the nuclear fuel cycle and contribute to energy security
- ✓ Contribute to realizing a low-carbon society as a CO2-free energy source

(Details of initiatives)

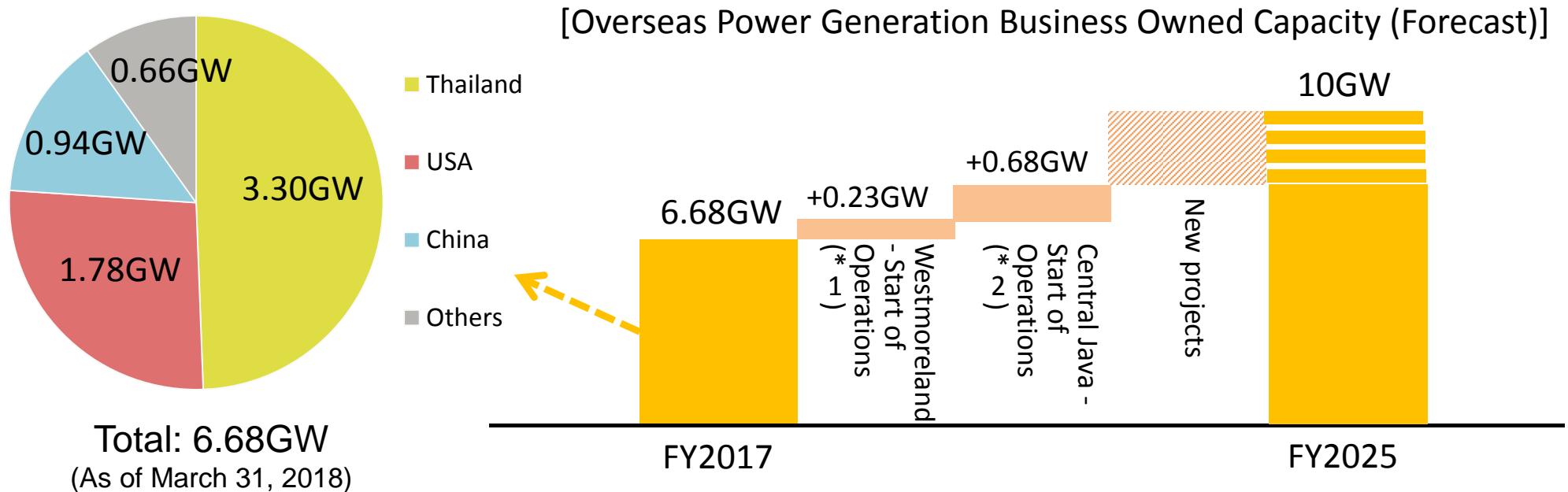
- Pursue further improvements in safety continuously
- Sincerely and appropriately respond to compliance reviews and aim to restart full scale construction work quickly
- Strive for more polite information communication and mutual communication so that we can gain the understanding and trust of the community

Overview of the Ohma Nuclear Power Project	
Location	Ohma-machi, Shimokita-gun, Aomori Prefecture
Capacity	1,383MW
Type of nuclear reactor	Advanced Boiling Water Reactor (ABWR)
Fuel	Enriched uranium and uranium-plutonium mixed oxide (MOX)
Start of construction	May, 2008
Start of operation	To be determined
Status	In December 2014, J-POWER submitted to NRA an application for permission for alteration of reactor installment license and an application for construction plan approval in order to undertake review of compliance with the new safety standards

# (4) Expansion of Overseas Business



- ✓ Have operations started for Central Java IPP in Indonesia (coal-fired thermal power, start of operations planned for 2020), Westmoreland in USA (gas-fired thermal power, start of operations planned for 2018)
- ✓ Expand business in Thailand, USA and China where we have our business platform, and aim to acquire projects in Indonesia and Taiwan where we already have results, and in new markets with robust energy demand
- ✓ Utilizing the technological capabilities we have built up in our domestic business, take steps to expand the renewable energy business overseas, including wind and hydroelectric power
- ✓ Increase the scale of generation assets (GW) through strengthening resources and expanding fields of activities



(\*1) Output capacity 926MW, gas-fired thermal power (CCGT: combined cycle), our owned capacity is 232MW from our equity holdings of 25%  
 (\*2) Output capacity 2,000MW, coal-fired thermal power (USC: ultra-super critical), our owned capacity is 680MW from our equity holdings of 34%

## (5) Improvement of value of existing facilities

- ✓ In the context of intensifying competition in association with deregulation, the J-POWER Group will play its expected role toward activating the wholesale electricity market essential for a competitive market through initiatives such as supplying power to the baseload power market
- ✓ Along with the increasing electricity sales volume for the wholesale electricity market accordingly, we will take the following steps to strengthen production division and diversify sales, in the stream toward fragmentation of the value for electricity into values of supply capability, adjustment capability, and non-fossil generation

(Strengthening production division)

- Strengthening our cost competitiveness through measures such as strengthening structures, based on the premise of stable supply and ensuring safety
- Increasing the flexibility of facility operations in response to market needs, and optimizing maintenance

(Diversifying ways of sales)

- Maximization of the value of the J-POWER Group's generating assets through diversification of ways of sales in response to the deregulated market
  - Supplying about 6 TWh to the baseload power market in the first year, followed by step-by-step expansion of power supply to the newly established markets including capacity market, non-fossil value market, and supply-demand adjustment market
- ✓ Concerning J-POWER's interconnecting lines and other transmission facilities, along with taking steps to maintain and improve facility reliability, we will contribute to the nationwide improvement of power grid by measures such as the strengthening of the Sakuma Frequency Converter Station and relevant facilities

## 3. Returns to Shareholders

- ✓ While there continue to be areas of uncertainty in its business environment, the J-POWER Group has formulated a new shareholder return policy in anticipation of changes in its business environment such as the progress of liberalization in Japan
- ✓ There will be no change in the basic emphasis on continuing to provide stable dividends, but based on changes in our earnings structure, while keeping a certain pay-out ratio in mind, we aim to continue providing returns that are in accordance with our profit level, within an appropriate balance of shareholder returns, business assets formation, and financial soundness
- ✓ We will continue to sustainably increase our corporate value and strive to enhance the returns to shareholders as a result of our growth

## Concept of Returns to Shareholders

Taking into account of factors such as the level of profit, earnings forecasts, and financial condition, we strive to enhance stable and continuous returns to shareholders in line with a consolidated pay-out ratio of around 30% excluding short-term profit fluctuation factors

# [Reference] Status of Major Projects under Development (1)

	Project	Output capacity	Construction status		Remarks
			In preparation	Underway	
Hydro	Akiba No.1 Repowering	45.3→47.2MW		◇	Completion of repowering : FY2018 (planned)
	Shinkaturazawa/ Kumaoui	21.9MW		◇	Start of operation : FY2022 (planned)
	Ashoro Repowering	40.0→42.3MW	◇		Completion of repowering : FY2022 (planned)
Wind	Setana Osato	50MW		◇	Start of operation : FY2019 (planned)
	Kuzumaki No.2	44.6MW		◇	Start of operation : FY2019 (planned)
	Nikaho No.2	41.4MW		◇	Start of operation : FY2019 (planned)
	Minami Ehime No.2	Max. 40.8MW	◇		Under environmental impact assessment
	Kaminokuni No.2	41MW ~ Max. 180MW	◇		Under environmental impact assessment
	Hibikinada Offshore*1	Max. 220MW	◇		Under environmental impact assessment
	Seiyo Yusuvara	Max. 180MW	◇		Under environmental impact assessment
	Kita-Kagoshima	Max. 180MW	◇		Under environmental impact assessment
	New Tomamae Replacement	30.6MW	◇		Under environmental impact assessment
	New Sarakitomanai Replacement	14.9MW	◇		Under environmental impact assessment
Geo-thermal	Wasabizawa*2	42MW		◇	Start of operation : FY2019 (planned)
	Onikobe Replacement	14.9MW	◇		Start of operation : FY2023 (planned)

\*1 J-POWER's equity ratio: 40% Joint venture with Kyuden Mirai Energy Company, Hokutaku, Saibu Gas, and Kyudenko Corporation

\*2 J-POWER's equity ratio: 50% Joint venture with Mitsubishi Materials Corporation and Mitsubishi Gas Chemical Company



# [Reference] Status of Major Projects under Development (2)

	Project	Output capacity	Construction status		Remarks
			In preparation	Underway	
Thermal	Takehara New Unit No.1	600MW		◇	Start of operation : FY2020 (planned)
	Kashima Power (Coal-fired)*3	645MW		◇	Start of operation : FY2020 (planned)
	Yamaguchi Ube Power (Coal-fired)*4	1,200MW	◇		Under environmental impact assessment
Nuclear	Ohma	1,383MW		◇	Under review of compliance with the new safety standards
T&D	Sakuma Frequency Converter Station and relevant facilities	300MW	◇		Increase of capacity: 300MW→600MW
Overseas	Westmoreland (U.S.A., gas-fired)*5	926MW		◇	Start of operation : FY2018 (planned)
	Central Java IPP (Indonesia, coal-fired)*6	2,000MW		◇	Start of operation : FY2020 (planned)

\* 3 J-POWER's equity ratio: 50% Joint venture with Nippon Steel & Sumitomo Metal Corporation

\* 4 J-POWER's equity ratio: 45% Joint venture with Osaka Gas and Ube Industries

\* 5 J-POWER's equity ratio: 25% Joint venture with Tenaska, Inc. and Diamond Generating Corporation

\* 6 J-POWER's equity ratio: 34% Joint venture with PT. ADARO POWER and ITOCHU Corporation

- ✓ Our hydroelectric generation capacity of approx. 8.57GW (61 plants) stands among the top in Japan
- ✓ We possess many dams and large capacity reservoirs with life of 100 years or more, which enables stable generation by CO<sub>2</sub>-free energy for a long time to come



Nukabira Dam

(Hokkaido prefecture)



Okutadami Dam

(Niigata prefecture, Fukushima prefecture)



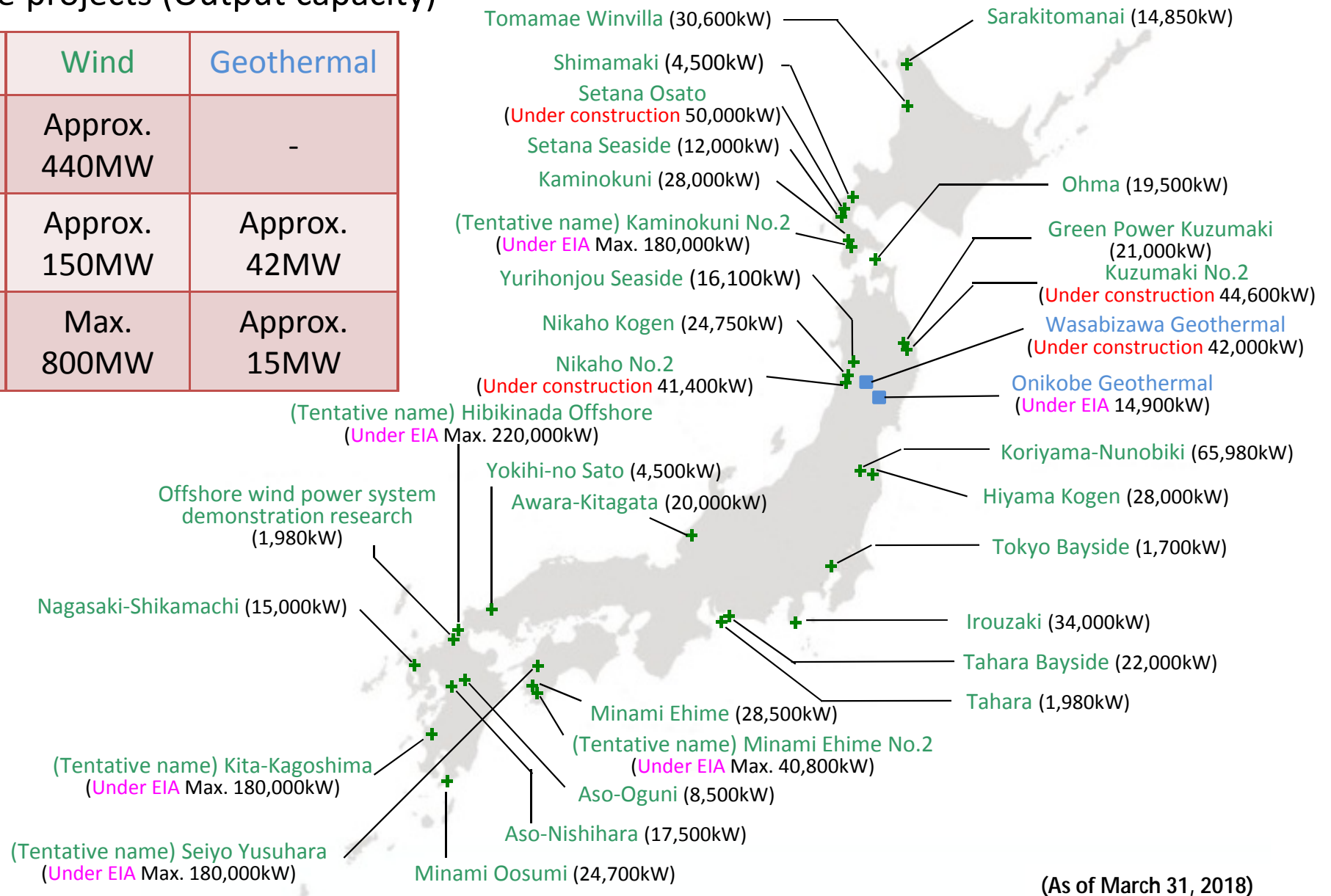
Sakuma Dam

(Shizuoka prefecture, Aichi prefecture)

- ✓ We will continue to contribute to the stable power supply through continuous efforts to operate power plants, making use of the experience and technology we have built up over the past 60 years
- ✓ We are aiming for increase hydroelectric power generation by 0.3TWh/year compared with FY2017, through increase in power generation by CO<sub>2</sub>-free energy in association with new development and repowering of hydroelectric power plants

## ✓ Renewable projects (Output capacity)

	Wind	Geothermal
In operation	Approx. 440MW	-
Under construction	Approx. 150MW	Approx. 42MW
Under EIA*1	Max. 800MW	Approx. 15MW



(As of March 31, 2018)

\*1 EIA: Environmental Impact Assessment

The following contains statements that constitute forward-looking statements, plans for the future, management targets, etc. relating to the Company and/or the J-POWER group.

These are based on current assumptions of future events, and there exist possibilities that such assumptions are objectively incorrect and actual results may differ from those in the statements as a result of various factors.

Furthermore, information and data other than those concerning the Company and its subsidiaries/affiliates are quoted from public information, and the Company has not verified and will not warrant its accuracy or appropriateness.