

Summary of FY2018 Earnings Results



Electric Power Development Co., Ltd.

April 26, 2019

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.

※Display of Figures

- ✓ All figures are consolidated unless stated otherwise.
- ✓ Amounts less than 100 million yen and electric power sales volume less than 100 million kWh shown in the consolidated financial data have been rounded down. Consequently, the sum of the individual amounts may not necessarily agree with figures shown in total columns.

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I. Summary of FY2018 Earnings Results

Summary of FY2018 Earnings Results



(Unit: billion yen)

Consolidated	FY2017	FY2018	Year-on-year		FY2018	Comparison with the	
	(Apr.-Mar.)	(Apr.-Mar.)	change		Forecast ^{*1}	forecast	
					(Apr.-Mar.)		
Operating Revenue	856.2	897.3	41.1	4.8 %	863.0	34.3	4.0 %
Operating Income	104.3	78.8	(25.4)	(24.4) %	84.0	(5.1)	(6.1) %
Ordinary Income	102.4	68.5	(33.9)	(33.1) %	70.0	(1.4)	(2.1) %
Profit attributable to owners of parent	68.4	46.2	(22.1)	(32.4) %	50.0	(3.7)	(7.5) %

Non-consolidated	FY2017	FY2018	Year-on-year		FY2018	Comparison with the	
	(Apr.-Mar.)	(Apr.-Mar.)	change		Forecast ^{*1}	forecast	
					(Apr.-Mar.)		
Operating Revenue	614.5	646.9	32.3	5.3 %	611.0	35.9	5.9 %
Operating Income	43.0	18.6	(24.3)	(56.6) %	26.0	(7.3)	(28.2) %
Ordinary Income	52.4	54.4	1.9	3.7 %	49.0	5.4	11.0 %
Profit	41.9	52.7	10.8	25.9 %	45.0	7.7	17.3 %

Growth indicator	FY2017	FY2018	Year-on-year		FY2018	Comparison with the	
	(Apr.-Mar.)	(Apr.-Mar.)	change		Forecast ^{*1}	forecast	
					(Apr.-Mar.)		
J-POWER EBITDA ^{*2}	196.3	168.4	(27.8)	(14.2) %	175.0	(6.5)	(3.7) %

*1 Forecast released on April 27, 2018

*2 J-POWER EBITDA = Operating income + Depreciation and amortization + Share of profit of entities accounted for using equity method

Key Data (Electric Power Sales)

	FY2017 (Apr.-Mar.)	FY2018 (Apr.-Mar.)	Year-on-year change	
Electric Power Sales (TWh)				
Electric Power Business	67.0	69.3	2.2	3.4%
Hydroelectric Power	9.2	9.7	0.4	5.0%
Thermal Power	56.7	54.9	(1.8)	(3.2)%
Wind Power	0.8	0.8	(0.0)	(1.2)%
Other ^{*1}	0.2	3.8		
Overseas Business ^{*2}	15.8	10.9	(4.9)	(31.1)%
Water supply rate	105%	106%	+ 1 point	
Load factor ^{*3}	80%	79%	(1) point	

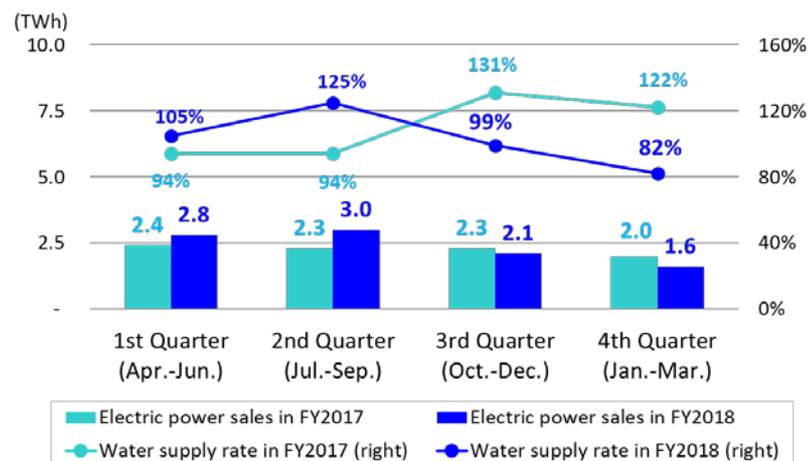
*1 Electric power sales volume of electricity procured from wholesale electricity market, etc.

*2 Electric power sales volume of overseas consolidated subsidiaries (Electric power sales volume of equity method affiliated companies is not included.)

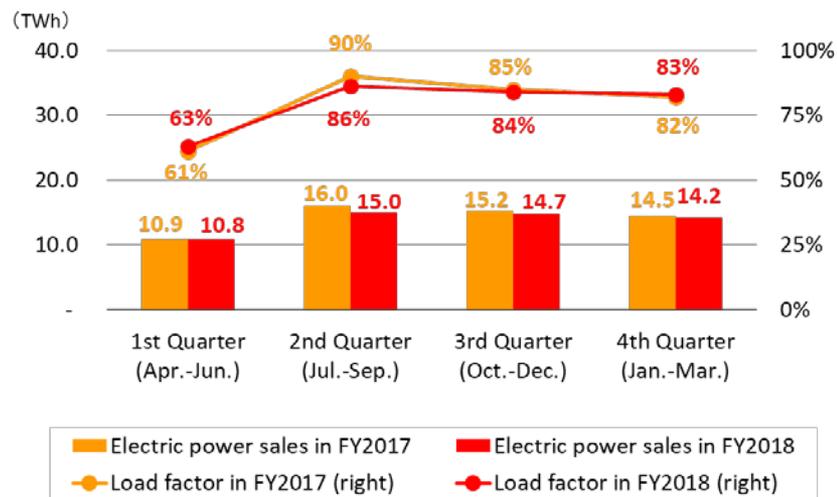
*3 Load factors of thermal power show the results for non-consolidated only.

Electric Power Sales for each Quarter

[Domestic Hydroelectric Power Business]



[Domestic Thermal Electric Power Business]



Key Data (Operating Revenue)



	FY2017 (Apr.-Mar.)	FY2018 (Apr.-Mar.)	Year-on-year change	
Operating Revenue (Billion yen)	856.2	897.3	41.1	4.8%
Electric Power Business	631.9	693.7	61.8	9.8%
Electric Power Generation Business	577.8	642.4	64.5	11.2%
Transmission / Transformation Business	48.6	49.4	0.8	1.7%
Overseas Business ^{*1}	163.0	141.0	(22.0)	(13.5)%
Other Business ^{*2}	61.2	62.5	1.3	2.1%
Foreign exchange rate at the end of December (Yen/US\$)	113.00	111.00		
Foreign exchange rate at the end of December (Yen/THB)	3.45	3.41		
Foreign exchange rate at the end of December (THB/US\$)	32.68	32.45		
Average foreign exchange rate (Yen/US\$)	110.85	110.92		

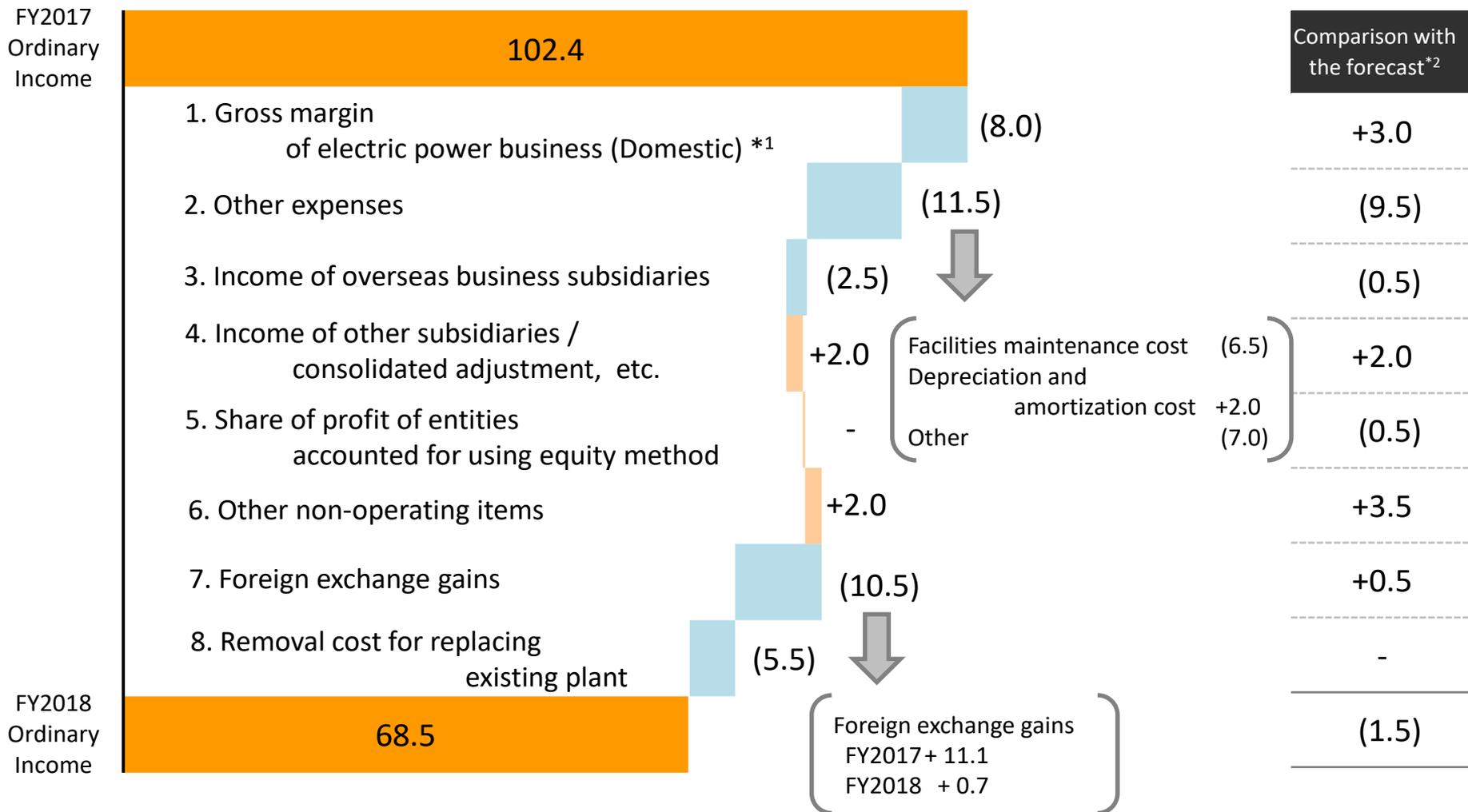
*1 Sales for the overseas business segment (Sales from overseas consolidated subsidiaries and overseas consulting business, etc.)

*2 "Other Business" is composed of "Electric Power-Related Business" segment and "Other Business" segment.

FY2018 Earnings Results (Main Factors for Change)



(Unit: billion yen)



*1 Gross margin of electric power business (Domestic) : Domestic electric power business revenue (hydro, thermal, wind and other) – fuel costs, etc.

*2 Forecast released on April 27, 2018

Revenue / Expenditure Comparison



(Unit: billion yen)

	FY2017 (Apr.-Mar.)	FY2018 (Apr.-Mar.)	Year-on-year change	Main factors for change
Operating Revenue	856.2	897.3	41.1	
Electric power business	631.9	693.7	61.8	Increase in fuel price and increase in electric power sales volume of electricity procured from wholesale electricity market, etc.
Overseas business	163.0	141.0	(22.0)	Decrease in electric power sales of power generation projects in Thailand, etc.
Other business	61.2	62.5	1.3	
Operating Expenses	751.9	818.5	66.6	Electric power business +86.6, Overseas business (19.2), Other business (0.7)
Operating Income	104.3	78.8	(25.4)	
Non-operating Revenue	29.1	18.8	(10.2)	
Share of profit of entities accounted for using equity	9.7	9.6	(0.0)	
Other	19.3	9.2	(10.1)	Foreign exchange gains (10.4)
Non-operating Expenses	30.9	29.2	(1.7)	
Interest expenses	28.3	26.3	(2.0)	
Other	2.5	2.8	0.2	
Ordinary Income	102.4	68.5	(33.9)	Electric power business (24.5), Overseas business (11.2), Other business +3.5
Extraordinary losses	3.3	-	(3.3)	
Profit attributable to owners of parent	68.4	46.2	(22.1)	

Balance Sheet



(Unit: billion yen)

	FY2017 End of FY	FY2018 End of FY	Change from prior year end	Main factors for change
Non-current Assets	2,325.2	2,401.6	76.4	
Electric utility plant and equipment	951.1	944.3	(6.8)	Non-consolidated +1.4, Subsidiaries and others (8.2)
Overseas business facilities	341.4	312.1	(29.2)	Thai power generation business subsidiaries (29.2)
Other non-current assets	93.4	94.8	1.4	
Construction in progress	525.7	582.0	56.3	Non-consolidated +25.8, Subsidiaries and others +30.4
Nuclear fuel	73.8	74.5	0.7	
Investments and other assets	339.7	393.7	54.0	Long-term investments +56.6
Current Assets	321.7	364.5	42.7	
Total Assets	2,647.0	2,766.1	119.1	
Interest-bearing debt	1,561.3	1,642.8	81.5	Non-consolidated +103.9, Subsidiaries (22.3) [Corporate bonds +80.0]
Other	249.5	277.7	28.1	
Total Liabilities	1,810.9	1,920.5	109.6	
Shareholders' equity	745.1	777.6	32.5	Increase in retained earnings
Accumulated other comprehensive income	42.1	19.7	(22.3)	Foreign currency translation adjustment (13.4)
Non-controlling interests	48.8	48.1	(0.7)	
Total Net Assets	836.1	845.5	9.4	
D/E ratio (x)	2.0	2.1		
Shareholders' equity ratio	29.7%	28.8%		

II. Summary of FY2019 Earnings Forecast

Summary of FY2019 Earnings Forecast and Dividends



(Unit: billion yen)

	Consolidated		
	FY2018 Result	FY2019 Forecast	Comparison with FY2018 result
Operating Revenue	897.3	940.0	42.6 4.8 %
Operating Income	78.8	73.0	(5.8) (7.4) %
Ordinary Income	68.5	60.0	(8.5) (12.5) %
Profit attributable to owners of parent	46.2	42.0	(4.2) (9.2) %

(Unit: billion yen)

	Non-consolidated		
	FY2018 Result	FY2019 Forecast	Comparison with FY2018 result
Operating Revenue	646.9	591.0	(55.9) (8.6) %
Operating Income	18.6	16.0	(2.6) (14.3) %
Ordinary Income	54.4	53.0	(1.4) (2.6) %
Profit	52.7	51.0	(1.7) (3.4) %

(Unit: billion yen)

Growth indicator	FY2018 Result	FY2019 Forecast	Comparison with FY2018 result
J-POWER EBITDA	168.4	166.0	(2.4) (1.5) %

Cash dividends per share

	Interim	Year end	Annual
FY2018	35 yen	40 yen	75 yen
FY2019 (Forecast)	35 yen	40 yen	75 yen

	FY2018 Result	FY2019 Forecast	Comparison with FY2018 Result			FY2018 Result	FY2019 Forecast
Electric Power Sales (TWh)					Water supply rate	106%	100%
Electric Power Business	69.3	72.8	3.5	5.1 %	Load factor	79%	76%
Hydroelectric Power	9.7	9.2	(0.5)	(5.2) %	Foreign exchange rate at term end		
Thermal Power	54.9	52.1	(2.8)	(5.2) %	Yen/US\$	111.00	110.00
Wind Power	0.8	0.8	0.0	6.5 %	Yen/THB	3.41	3.50
Other ^{*1}	3.8	10.7	6.8	175.4 %	THB/US\$	32.45	32.45
Overseas Business^{*2}	10.9	12.6	1.7	15.7 %	Average foreign exchange rate		
Operating Revenue (Billion yen)	897.3	940.0	42.6	4.8 %	Yen/US\$	110.92	110.00
Electric Power Business	693.7	711.0	17.2	2.5 %			
Electric Power Generation Business	642.4	658.0	15.5	2.4 %			
Transmission/Transformation Business	49.4	50.0	0.5	1.0 %			
Overseas Business^{*3}	141.0	163.0	21.9	15.6 %			
Other Business^{*4}	62.5	66.0	3.4	5.5 %			

*1 Electric power sales volume of electricity procured from wholesale electricity market, etc.

*2 Electric power sales volume of overseas consolidated subsidiaries (Electric power sales volume of equity method affiliated companies is not included.)

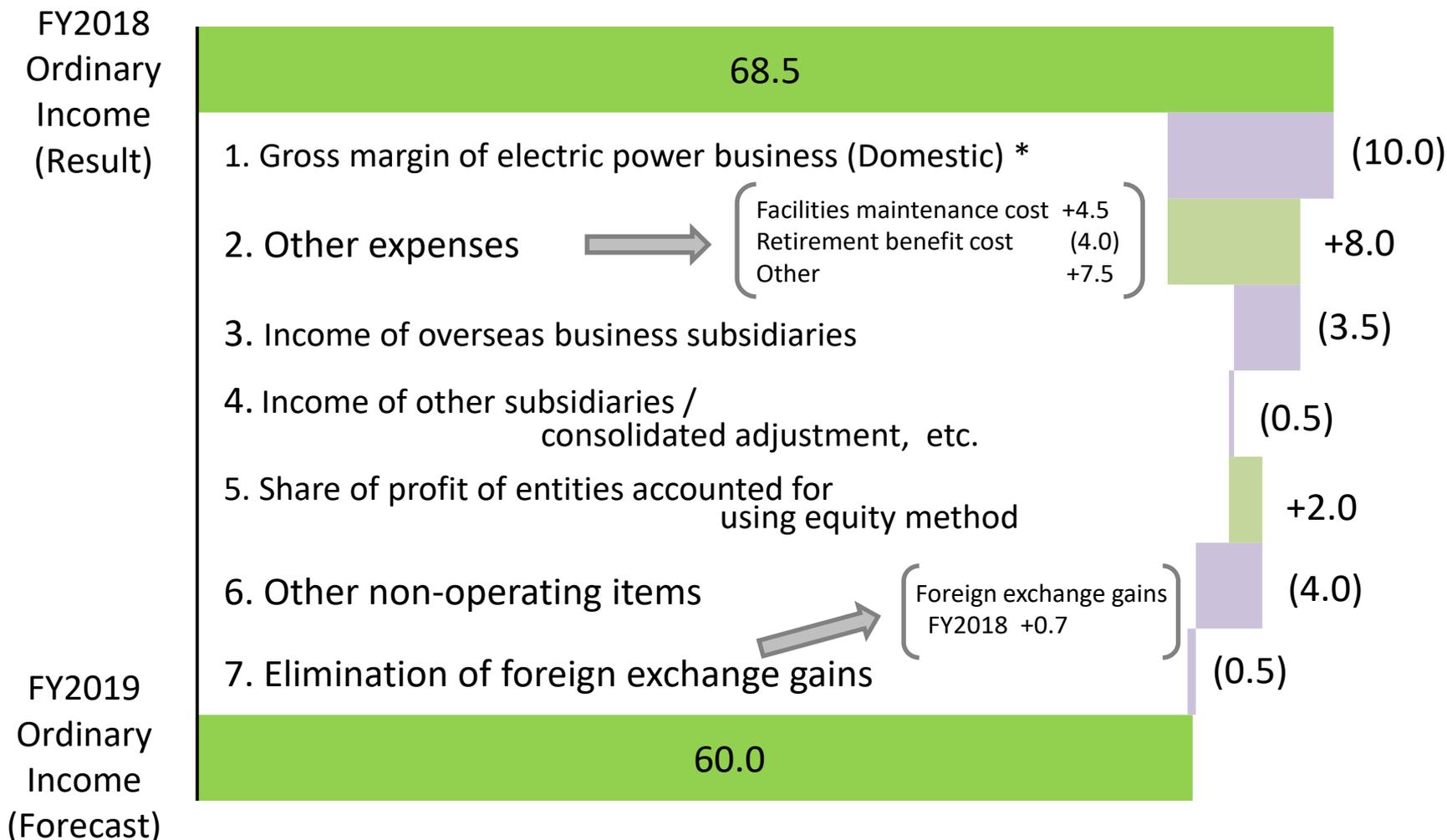
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*4 "Other business" is composed of "Electric power-related business" segment and "Other business" segment.

FY2019 Earnings Forecast (Main Factors for Change)



(Unit: billion yen)



* Gross margin of electric power business (Domestic) : Domestic electric power business revenue (hydro, thermal, wind and other) – fuel costs, etc.

III. Status of Addressing the Medium-term Management Plan

I . Awareness of the Business Environment

Awareness of the Business Environment Surrounding J-POWER Group



- Sustainable Development Goals (SDGs) have been adopted by UN in Sep. 2015
- The society has largely shifted toward the realization of "decarbonized society" as seen in energy conversion and decarbonization
- Industrial structure innovation is expected in the future with the advance of digital technology
- Make major changes in business environment a growth opportunity based on business philosophy

Climate change issues

- ✓ Movement toward "decarbonized society"
 - Paris Agreement (Dec. 2015)
 - Medium-term target of Japan (Reduce GHG by 26.0% in FY2030 compared with FY2013)
 - Expansion of ESG investment

Advance of digital technology

- ✓ Optimal operation and advanced maintenance of power plants using AI and IoT
- ✓ Decentralization using digital technology

Intensifying competition in the domestic power market

- ✓ Sluggish growth of domestic electricity demand
- ✓ Advance of deregulation and market competition through electricity system reform

Growth of electricity demand overseas

- ✓ Expected growth of overseas electricity demand mainly in developing countries

II . Progress of the Medium-term Management Plan

- J-POWER Group released Medium-term management plan in July 2015
- In April 2018, released a review of efforts undertaken and new forecasts for the next three years
- Earnings in FY2019 is estimated to decrease due to one-off factors including abolishment of Takehara Unit No.2, followed by expected earnings improvement in FY2020 due to commencement of operations of new power plants. Continue efforts toward realization of growth

■ Medium-term Management Plan

	Indicator	Target
Growth	J-POWER EBITDA*	Increase to around 1.5x the level of FY2014 in FY2025 (FY2014 result : 181.8 billion yen)
Soundness	$\frac{\text{Interest-bearing debts}}{\text{J-POWER EBITDA}}$	Improve from level at end of FY2014 by end of FY2025 (End of FY2014 result : 9.5x)

■ Three-year forecasts and results

		Growth indicator	Soundness indicator
FY2015-2017	Forecast	185.0 billion yen/year (FY2015-2017 3-year average)	Maintain same level as results at end of FY2014 (9.5x) at end of FY2017
	Result	186.7 billion yen/year (FY2015-2017 3-year average)	8.0x (FY2017 result)
FY2018-2020	Forecast	≧210.0 billion yen (FY2020)	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

III. Status of Addressing the Medium-term Management Plan

1. Further Expansion of Renewable Energy

- J-POWER Group owns 8,575MW of hydro and 443MW of wind (as of Mar. 31, 2019), a leader of renewable energy
- Steadily progressing toward FY2025 renewable energy targets **“1GW scale new development”, “0.3TWh/year increase in hydro and 2.5TWh/year increase in wind and others (compared with FY2017)”**
- Established Renewable Energy Business Strategy Dept. in Apr. 2019 to expand business and optimize operation and maintenance while addressing various changes in business environment

■ Efforts in FY2018

Hydro

- Commencement of construction work at Shinkatsurazawa hydro project (22MW)
- Completion of overall renewal at Akiba No.1 and No.2 plants, which has increased capacity by 2MW
- Commencement of construction work at Ashoro plant repowering project (2MW increase)
- Improvement of water intake equipment at Hinoemata and Chinabora intake dams which lead to 27GWh increase

Wind

- Participation in Triton Knoll offshore wind project (860MW) in U.K.
- Commencement of environmental impact assessment procedure at three sites (Wajima, Youra and Kunimiyama) totaling max. 250MW
- Preparation for construction (commencement scheduled in May 2019) at Kaminokuni No.2 (42MW)
- Promotion of construction work at Setana Osato (50MW), Nikaho No.2 (41MW) and Kuzumaki No.2 (44MW) which are scheduled to commence operation in Jan., Jan. and Dec. in 2020 respectively
- Memorandum of understanding signed with ENGIE (France) for collaboration in domestically commercializing floating type offshore wind power, etc.

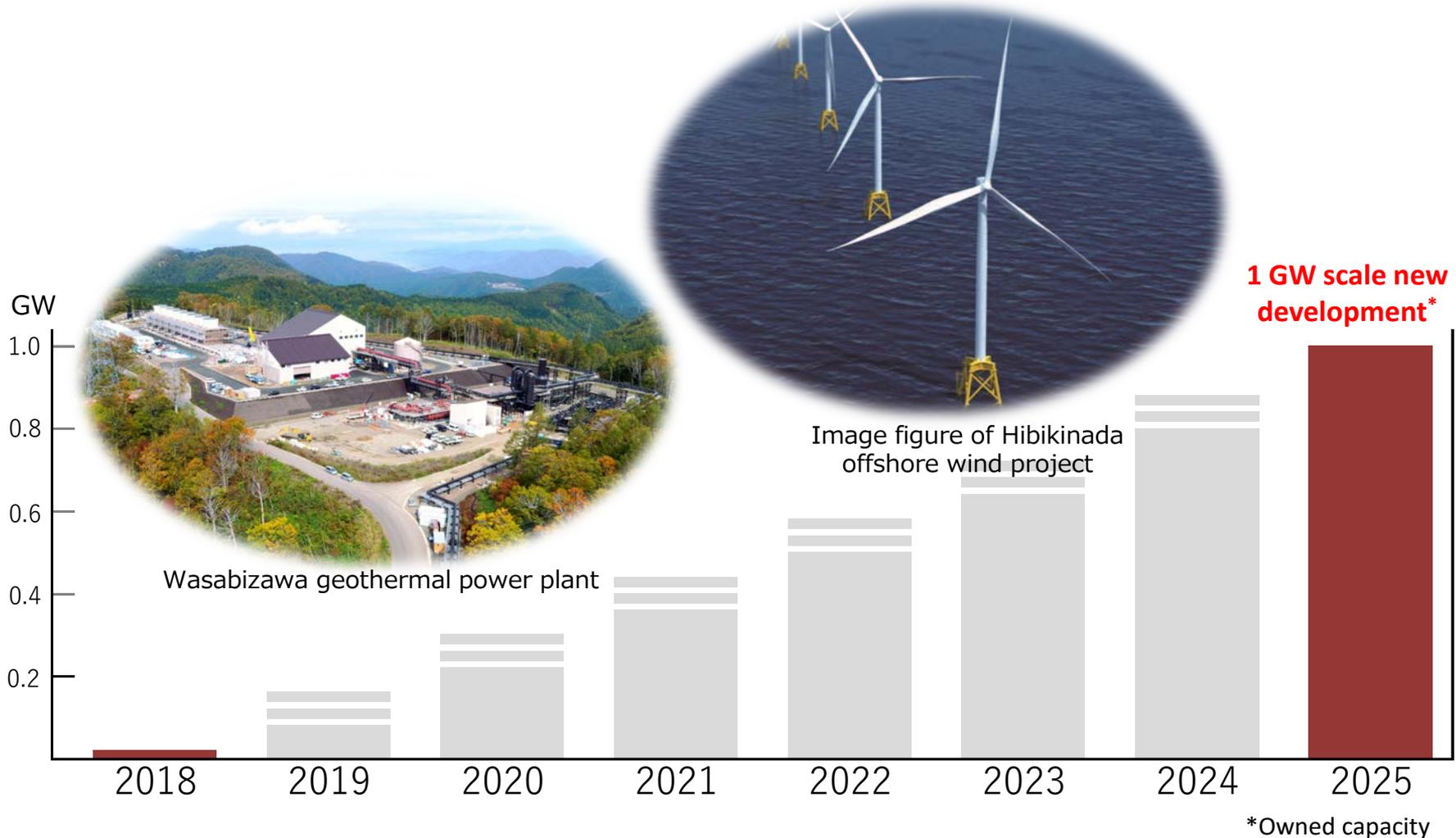
Geo-thermal

- Promotion of construction work at Wasabizawa geothermal (42MW) which is scheduled to commence operation in May 2019
- Commencement of construction work at Onikobe geothermal replacement project (15MW) in April 2019
- Promotion of commercialization of Appi geothermal (15MW)

1. Further Expansion of Renewable Energy

■ Effort expanding renewable energy

- ✓ Sea area surveys outside port area for offshore wind power
- ✓ Geothermal resource surveys at Takahinatayama site (Osaki city, Miyagi prefecture)



2. Strive toward Zero Emission in Coal Use

- Basic Energy Plan estimates 26% share for coal-fired thermal power in FY2030 in Japan
- Afterward, stream from carbon reduction to decarbonization in fossil fuel use may get larger due to significant increase in renewable energy and further progress of decentralization caused by utilization of digital technology
- In such an environment, coal, which is cheap and has excellent procurement stability, is essential for Japan's energy security, so it is necessary to continue using it while making it compatible with the climate change issues
- As a leading company in coal use technology, J-POWER Group will strive to achieve zero emission in coal use through such as carbon recycling based on its technology, and contribute to the realization of a “decarbonized society”

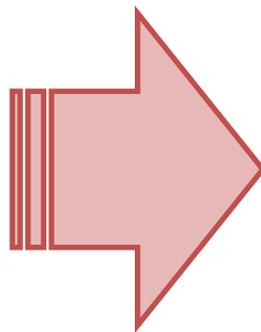
■ Initiatives toward zero emission in coal use

Features of oxygen-blown IGCC*¹ under demonstration at Osaki CoolGen

- Highly efficient
- Best suitable to CO₂ separation and capture
- Available for multi purpose other than power generation
- High load tracking ability
- Technological verification completed at Osaki CoolGen



Oxygen-blown IGCC demonstration testing plant (Hiroshima prefecture)



Carbon recycling

- Use and storage of CO₂ separated and captured (CCUS)

Contribution to hydrogen society

- Demonstration tests of IGFC*² which utilize fuel cell at Osaki CoolGen

Manufacture of diverse products

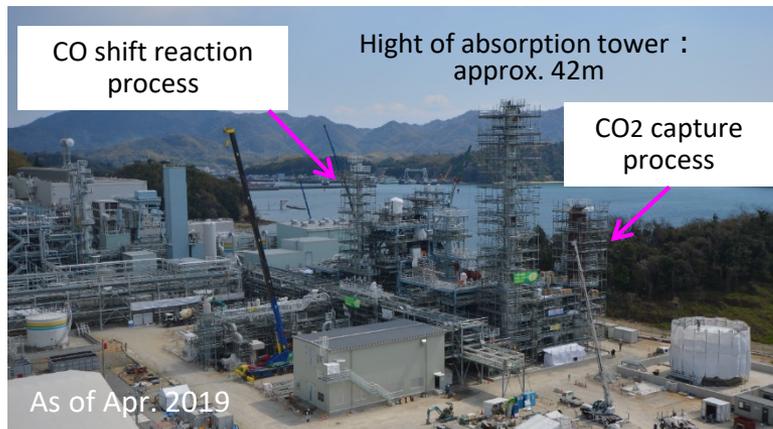
- Development of products using recovered CO₂

2. Strive toward Zero Emission in Coal Use

■ Initiatives for carbon recycling

- Demonstration tests of IGCC with CO₂ capture is scheduled to commence around Dec. 2019 at Osaki CoolGen
- Examine the use of captured CO₂ while grasping its properties as gas

Osaki CoolGen (Demonstration plant of IGCC with CO₂ capture)



Example of using captured CO₂ to be examined (Agricultural use)



With CO₂ captured from IGCC, increase the concentration of carbon dioxide in the agricultural greenhouse and promote crop growth to improve agricultural productivity.

■ Participation in Australian brown coal hydrogen pilot test project

- Aiming to build and commercialize a CO₂-free hydrogen supply chain, J-POWER is participating in a pilot test project to produce hydrogen by gasifying Australian brown coal, an abundant, underutilized resource, and transport it to Japan.
- When this supply chain is commercialized, plans call for utilizing CCS to store the CO₂ produced during the manufacture of hydrogen from brown coal, avoiding its release to the atmosphere and thus achieving CO₂-free operations.

Conceptual rendering of the completed brown coal gasification facilities



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 “decarbonized society” as a CO₂-free energy source

(Details of initiatives)

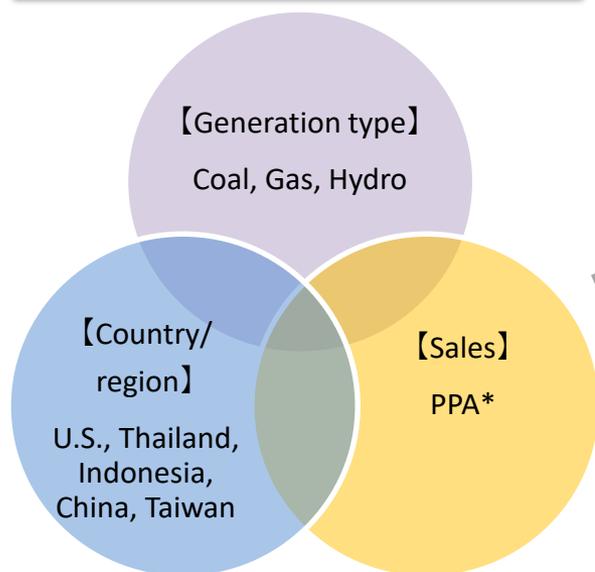
- Pursue further improvements in safety continuously
- Sincerely and appropriately respond to compliance reviews and aim to restart full scale construction work quickly
- Strive for more polite information communication and mutual communication so that we can gain the understanding and trust of the community

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

- Westmoreland thermal power station (926MW) in U.S. has commenced operation in Dec. 2018
- Steadily promote construction work at Central Java coal-fired thermal power (2,000MW) in Indonesia and Triton Knoll offshore wind power (860MW) in U.K.
- Promote the introduction of high-efficiency thermal power and renewable energy to support sustainable growth in countries and regions overseas where power demand is expected to grow, especially in emerging countries

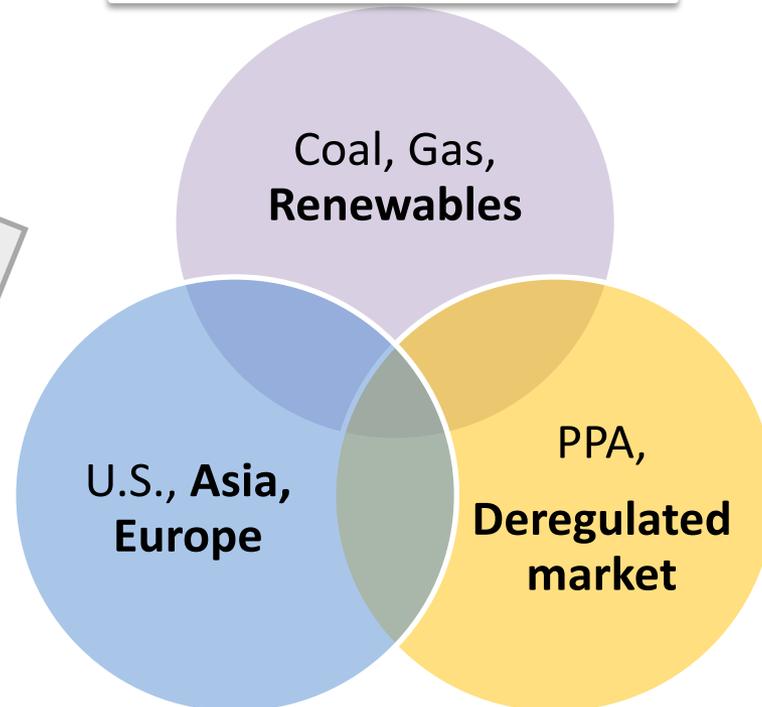
Overseas business current asset



6,898MW as of Mar. 31, 2019

Further growth of generating asset

FY2025



Overseas owned capacity 10GW

*Power Purchase Agreement: Contract parties determine price, volume and other conditions of electricity delivered

5. Value Maximization of Current Assets

- In the midst of intensified competition as a result of deregulation, J-POWER Group maximizes its corporate value through enhancing competitiveness of its generating assets, making advantage of newly established markets and diversifying ways of sales

Strengthening production function

- With stable supply and ensuring safety as the major prerequisite, strengthen cost competitiveness by utilizing digital technologies and other ways
- Improve flexibility of operation and optimize maintenance to meet market needs

Diversifying ways of sales

- Adapt to market competition brought about by deregulation and maximize corporate value through diversifying ways of sales such as investment in ENERES Co., Ltd. and Suzuyo-Power Co., Ltd., and making advantage of newly established markets including baseload market and capacity market

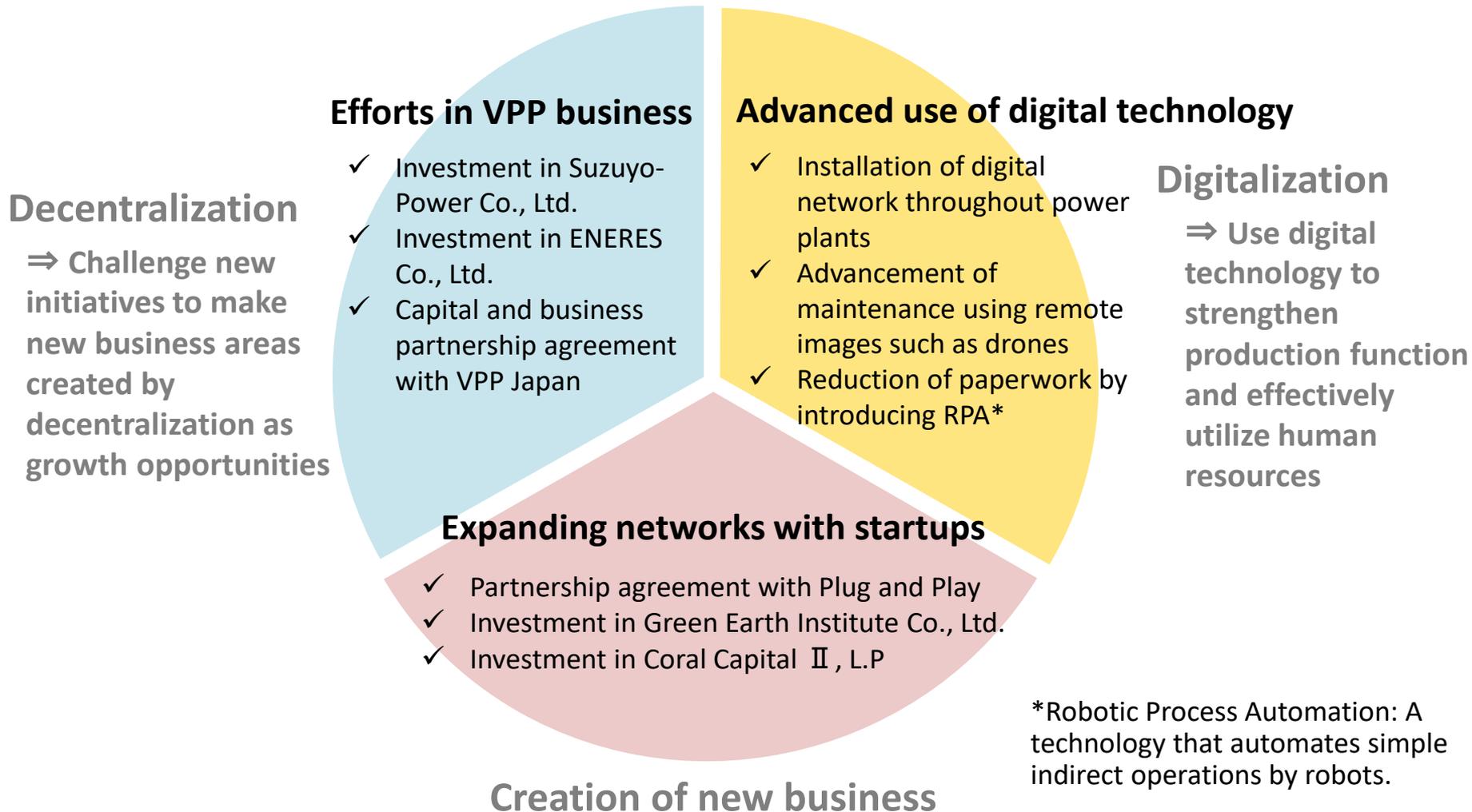
Enhancing reliability and nationwide improvement of power grid

- Enhance reliability of interconnecting lines such as Hokkaido-Honshu HVDC Interconnection Line and major transmission and transformation facilities which J-POWER owns
- While expanding Sakuma frequency conversion facilities* and related facilities, contribute to stable supply, enhanced resilience, and furthermore, nationwide improvement of power network

*Frequency converter station which links east Japan (50Hz) with west Japan (60Hz)

6. Strive toward Further Growth

- In anticipation of future changes in the business environment and industrial structure, we will continuously challenge new efforts to make change an opportunity for growth



IV. Contribution to SDGs based on Corporate Philosophy - ESG Initiatives -

- We will continue to contribute to sustainable development while making the corporate philosophy the foundation of our business activities.

Corporate Philosophy of J-POWER Group

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

Established in September 1998



Adopted in September 2015

- Take actual steps toward “harmonizing energy supply and the environment”

Environment

- ❑ Contribution to realizing “decarbonized society”
 - ✓ Stable operation and expansion of renewable energy
 - ✓ Strive toward zero emission in coal use
 - ✓ Promotion of the Ohma Nuclear Power Plant Project, with safety as the major prerequisite
- ❑ Addressing local environmental issues
 - ✓ Efforts for protecting water, forests and biodiversity

Social

- ❑ Contribution to realizing the Energy Mix in Japan
- ❑ Power supply in developing countries which face strong energy demand
- ❑ Respect for human resources
 - ✓ Efforts toward enhanced diversity; Develop working environment where diversified human resources including women and seniors can be more active
 - ✓ Continuous improvement of work style named “JPOWER Challenge 30” and promotion of flexible working including working at home and hourly vacation
- ❑ Contribution to society
 - ✓ Cooperation to local community, support for volunteer activities

Governance

- ❑ Respect for shareholders’ rights; Timely disclosure
- ❑ Effort for enhanced effectiveness of board of directors; Annual analysis and valuation of effectiveness

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

	Project	Output capacity	Construction status		Remarks
			In preparation	Underway	
Wind	Setana Osato* ¹	50MW		◇	Start of operation : FY2019 (planned)
	Nikaho No.2	41.4MW		◇	Start of operation : FY2019 (planned)
	Kuzumaki No.2	44.6MW		◇	Start of operation : FY2020 (planned)
	Minami Ehime No.2	Max. 40.8MW	◇		Under environmental impact assessment
	Kaminokuni No.2	Phase I 41.5MW (Max. 120.4MW)	◇		Start of construction work : May 2019 (planned)
	Hibikinada Offshore* ²	Max. 220MW	◇		Under environmental impact assessment
	Seiyo Yusuhara	Max. 180MW	◇		Under environmental impact assessment
	Kita-Kagoshima	Max. 215MW	◇		Under environmental impact assessment
	Wajima	Max. 90.3MW	◇		Under environmental impact assessment
	Youra	Max. 64.5MW	◇		Under environmental impact assessment
	Kunimiyama	Max. 94.6MW	◇		Under environmental impact assessment
	New Tomamae Replacement	30.6MW	◇		Start of construction work : FY2020 (planned)
	New Sarakitomanai Replacement	14.9MW	◇		Under environmental impact assessment
	New Shimamaki Replacement	4.3MW	◇		Start of construction work : FY2020 (planned)

*1 J-POWER's equity ratio: 90% Joint venture with Hokutaku

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

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

	Project	Output capacity	Construction status		Remarks
			In preparation	Underway	
Hydro	Shinkatsurazawa/ Kumaoui	21.9MW		◇	Start of operation : FY2022 (planned)
	Ashoro Repowering	40.0→42.3MW		◇	Completion of repowering : FY2022 (planned)
Geo-thermal	Wasabizawa* ³	42MW		◇	Start of operation : FY2019 (planned)
	Onikobe Replacement	14.9MW		◇	Start of operation : FY2023 (planned)
	Appi* ⁴	14.9MW	◇		Start of operation : Around spring in 2024 (planned)
Thermal	Takehara New Unit No.1	600MW		◇	Start of operation : FY2020 (planned)
	Kashima Power (Coal-fired)* ⁵	645MW		◇	Start of operation : FY2020 (planned)
	Yamaguchi Ube Power	-			Plan under review
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	Central Java IPP (Indonesia, coal-fired)* ⁶	2,000MW		◇	Start of operation : FY2020 (planned)
	Triton Knoll (U.K., offshore wind)* ⁶	860MW		◇	Start of operation : FY2021 (planned)

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

*4 J-POWER's equity ratio: 15% Joint venture with Mitsubishi Materials Corporation and Mitsubishi Gas Chemical Company

*5 J-POWER's equity ratio: 50% Joint venture with Nippon Steel Corporation

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

*7 J-POWER's equity ratio: 25% Joint venture with innogy SE and Kansai Electric Power

- ✓ 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 CO₂-free energy for a long time to come



Nukabira Dam
(Hokkaido prefecture)



Okutadami Dam
(Fukushima prefecture, Niigata prefecture)



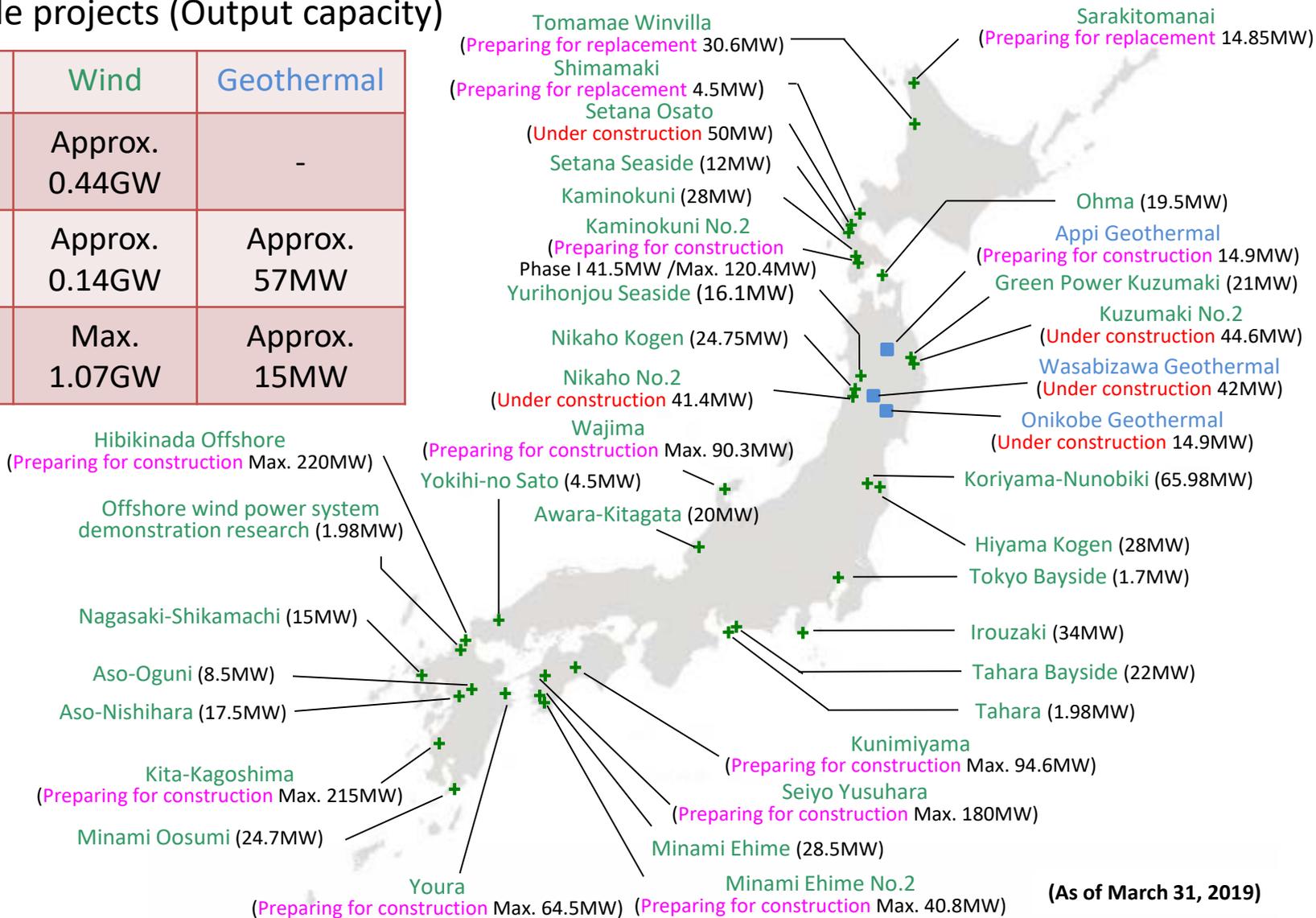
Sakuma Dam
(Shizuoka prefecture, Aichi prefecture)

- ✓ 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

[Reference] Renewable Energy of J-POWER (Wind & Geothermal)

✓ Renewable projects (Output capacity)

	Wind	Geothermal
In operation	Approx. 0.44GW	-
Under construction	Approx. 0.14GW	Approx. 57MW
Preparing for construction	Max. 1.07GW	Approx. 15MW



(As of March 31, 2019)

APPENDIX

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(1)-1. Consolidated: Revenues and Expenses



(Unit: 100 million yen)

	FY2014	FY2015	FY2016	FY2017	FY2018
Operating revenue	7,506	7,800	7,444	8,562	8,973
Electric utility operating revenue	5,881	5,708	5,385	6,319	6,937
Overseas business operating revenue	1,089	1,559	1,498	1,630	1,410
Other business operating revenue	535	532	559	612	625
Operating expenses	6,777	6,921	6,626	7,519	8,185
Operating income	728	879	817	1,043	788
Non-operating revenue	227	178	205	291	188
Share of profit of entities accounted for using equity method	156	108	132	97	96
Other	70	69	72	193	92
Non-operating expenses	362	472	351	309	292
Interest expenses	282	304	297	283	263
Other	79	167	53	25	28
Ordinary income	593	585	671	1,024	685
Extraordinary income	21	-	-	-	-
Extraordinary losses	-	-	-	33	-
Profit attributable to owners of parent	432	400	414	684	462

(1)-2. Consolidated: Cash Flow



(Unit: 100 million yen)

	FY2014	FY2015	FY2016	FY2017	FY2018
Operating activities	1,478	1,461	1,154	1,603	1,484
Profit before income taxes	615	584	671	990	685
(reference) Non-consolidated depreciation and amortization	778	734	496	534	510
Investing activities	(1,429)	(1,315)	(1,376)	(1,096)	(1,704)
Capital expenditure for subsidiaries (reference)	(879)	(375)	(175)	(147)	(198)
Non-consolidated CAPEX*	(611)	(1,063)	(998)	(941)	(889)
Free cash flow	48	145	(222)	506	(220)

* Non-consolidated capital expenditure: Increase in tangible and intangible noncurrent assets

(1)-3. Consolidated: Segment Information



(Unit: 100 million yen)

		Electric power	Electric power -related	Overseas	Other	Subtotal	Elimination*	Consolidated
FY2018	Sales	6,956	4,553	1,410	303	13,223	(4,250)	8,973
	Sales to customers	6,937	355	1,410	270	8,973	-	8,973
	Ordinary income	149	264	292	13	721	(35)	685
FY2017	Sales	6,337	4,127	1,630	272	12,367	(3,805)	8,562
	Sales to customers	6,319	369	1,630	243	8,562	-	8,562
	Ordinary income	395	230	405	12	1,044	(19)	1,024
year-on-year change	Sales	619	426	(220)	31	856	(444)	411
	Sales to customers	618	(14)	(220)	27	411	-	411
	Ordinary income	(245)	33	(112)	1	(323)	(16)	(339)

“Electric Power Business”

J-POWER group’s hydroelectric, thermal power (including subsidiaries’ thermal power (IPPs, for PPSs and others)), wind power and transmission business. The majority of consolidated revenue is derived from this segment.

“Electric Power-Related business”

These focus on peripheral business essential for the operation of power plants and transmission facilities, such as designing, executing, inspecting and maintaining power facilities and importing and transporting coal. Intra-group transactions account for a large portion of this segment, such as Company’s power plant maintenance, coal transportation activities.

“Overseas business”

Overseas power generation business, overseas engineering and consulting business

“Other business”

Diversified business such as telecommunication, environmental and the sale of coal

* Elimination includes elimination of intersegment sales

(1)-4. Consolidated: Key Ratios and Key Data

(Unit: 100 million yen)

	FY2014	FY2015	FY2016	FY2017	FY2018
(PL) Operating revenue	7,506	7,800	7,444	8,562	8,973
Operating income	728	879	817	1,043	788
Ordinary income	593	585	671	1,024	685
Profit attributable to owners of parent	432	400	414	684	462
(BS) Total assets	26,591	25,407	26,062	26,470	27,661
Construction in progress	5,069	4,410	4,761	5,257	5,820
Shareholders' equity	6,887	6,665	7,238	7,872	7,974
Net assets	6,962	6,754	7,640	8,361	8,455
Interest-bearing debt	17,236	16,287	16,200	15,613	16,428
(CF) Investing activities	(1,429)	(1,315)	(1,376)	(1,096)	(1,704)
Free cash flow	48	145	(222)	506	(220)
(Ref) Non-consolidated CAPEX*1	(611)	(1,063)	(998)	(941)	(889)
(Ref) Non-consolidated depreciation	778	734	496	534	510
ROA (%)	2.4	2.3	2.6	3.9	2.5
ROA (ROA excl. Construction in progress) (%)	2.9	2.8	3.2	4.8	3.2
ROE (%)	7.2	5.9	6.0	9.1	5.8
EPS (¥)	284.43	218.97	226.33	373.93	252.68
BPS (¥)	3,762.52	3,641.59	3,954.22	4,300.98	4,356.54
Shareholders' equity ratio (%)	25.9	26.2	27.8	29.7	28.8
D/E ratio	2.5	2.4	2.2	2.0	2.1
Number of shares issued*2 (thousand)	183,050	183,049	183,049	183,049	183,048

*1 Non-consolidated capital expenditure: Increase in tangible and intangible non-current assets

*2 Number of shares issued at the end of the fiscal year (excluding treasury stock)

(1)-5. Non-consolidated: Revenues and Expenses



(Unit: 100 million yen)

	FY2014	FY2015	FY2016	FY2017	FY2018
Operating revenue	5,579	5,523	5,224	6,145	6,469
Electric power business	5,485	5,430	5,109	6,014	6,336
Sold power to other suppliers	4,953	4,902	4,579	5,456	5,806
Transmission and other	532	527	529	558	529
Incidental business	93	93	115	131	133
Operating expenses	5,133	5,107	4,948	5,715	6,282
Electric power business	5,049	5,023	4,842	5,593	6,157
Personnel expense	285	318	436	342	324
Amortization of the actuarial difference in retirement benefits	(43)	(23)	107	(1)	(14)
Fuel cost	2,284	2,184	1,968	2,573	2,890
Repair and maintenance cost	610	583	683	634	697
Depreciation and amortization cost	778	734	496	534	510
Other	1,090	1,202	1,257	1,508	1,734
Incidental business	84	84	105	122	125
Operating income	445	415	276	430	186

(1)-5. Non-consolidated: Revenues and Expenses

(Unit: 100 million yen)

【 Amortization of the actuarial difference 】		FY2014	FY2015	FY2016	FY2017	FY2018
Actuarial difference	The remainder in the previous year (c)	(14)	(20)	(10)	49	(0)
	Actuarial difference in the previous year	(49)	(13)	167	(51)	(20)
	Subtotal (a)	(63)	(33)	156	(1)	(21)
Amortization *(b)		(43)	(23)	107	(1)	(14)
The remainder in the present year (c=a-b)		(20)	(10)	49	(0)	(6)

(Unit: 100 million yen)

【 Repair expense 】		FY2014	FY2015	FY2016	FY2017	FY2018
Hydroelectric		133	121	119	119	168
Thermal		423	409	507	460	452
Transmission		36	34	39	39	59
Others		15	16	17	15	16
Total		610	583	683	634	697

(Unit: 100 million yen)

【 Depreciation and amortization cost 】		FY2014	FY2015	FY2016	FY2017	FY2018
Hydroelectric		209	206	132	151	143
Thermal		379	334	230	243	230
Transmission		143	138	100	105	100
Others		44	55	33	34	35
Total		778	734	496	534	510

* Actuarial difference is amortized by the declining-balance method over two years from the year following the year in which they occurred.

(1)-6. Non-consolidated: Balance Sheet



(Unit: million yen)

	FY2017 End of FY	FY2018 End of FY
Assets		
Non-current assets	1,936,710	2,015,859
Electric utility plant and equipment	921,000	922,427
Hydroelectric power production facilities	358,916	363,959
Thermal power production facilities	311,298	309,185
Transmission facilities	155,982	153,577
Transformation facilities	31,097	31,156
Communication facilities	9,022	9,255
General facilities	54,683	55,293
Incidental business facilities	2,029	2,361
Non-operating facilities	452	409
Construction in progress	533,741	559,618
Construction in progress	531,567	558,080
Retirement in progress	2,174	1,538
Nuclear fuel	73,800	74,514
Nuclear fuel in processing	73,800	74,514
Investments and other assets	405,685	456,527
Long-term investments	65,105	54,408
Long-term investment for subsidiaries and associates	284,479	348,888
Long-term prepaid expenses	28,011	21,034
Deferred tax assets	28,205	32,195
Allowance for doubtful accounts	(116)	-
Current assets	138,995	195,956
Cash and deposits	10,550	12,060
Accounts receivable-trade	50,026	36,832
Other accounts receivable	1,932	1,242
Short-term investments	9,000	66,000
Supplies	39,350	39,175
Prepaid expenses	2,764	2,213
Short-term receivables from subsidiaries and associates	5,835	15,694
Other current assets	20,447	22,737
Allowance for doubtful accounts	(913)	-
Total assets	2,075,706	2,211,815

(Unit: million yen)

	FY2017 End of FY	FY2018 End of FY
Liabilities		
Non-current liabilities	1,226,571	1,293,525
Bonds payable	554,991	614,992
Long-term loans payable	607,250	606,370
Long-term accrued liabilities	5,269	5,269
Lease obligations	157	221
Long-term debt to subsidiaries and associates	1,652	1,636
Provision for retirement benefits	46,340	43,561
Asset retirement obligations	6,231	6,149
Other non-current liabilities	4,677	15,324
Current liabilities	258,207	296,013
Current portion of non-current liabilities	94,210	140,789
Short-term loans payable	16,650	14,750
Accounts payable-trade	7,233	5,612
Accounts payable-other	12,035	14,329
Accrued expenses	12,833	15,116
Accrued taxes	13,892	5,512
Deposits received	491	498
Short-term debt to subsidiaries and associates	97,507	94,200
Other advances	201	658
Other current liabilities	3,152	4,545
Total liabilities	1,484,778	1,589,538
Net assets		
Shareholders' equity	574,753	613,807
Capital stock	180,502	180,502
Capital surplus	109,904	109,904
Legal capital surplus	109,904	109,904
Retained earnings	284,352	323,408
Legal retained earnings	6,029	6,029
Other retained earnings	278,323	317,379
Reserve for special disaster	72	71
Exchange-fluctuation preparation reserve	1,960	1,960
General reserve	222,861	262,861
Retained earnings brought forward	53,429	52,486
Treasury shares	(6)	(7)
Valuation and translation adjustments	16,174	8,469
Valuation difference on available-for-sale securities	15,592	11,313
Deferred gains or losses on hedges	581	(2,843)
Total net assets	590,927	622,277
Total liabilities and net assets	2,075,706	2,211,815

* For consolidated balance sheet, please refer to the Financial Results disclosed on April 26, 2019

(1)-7. Non-consolidated: Statement of Income



(Unit: million yen)

	FY2017 (Apr.-Mar)	FY2018 (Apr.-Mar)
Operating revenue	614,591	646,958
Electric utility operating revenue	601,475	633,617
Sold power to other suppliers	545,659	580,652
Transmission revenue	48,679	49,497
Other electricity revenue	7,136	3,467
Incidental business operating revenue	13,115	13,340
Operating revenue-consulting business	1,687	2,152
Operating revenue-coal sale business	10,357	10,130
Operating revenue-other businesses	1,070	1,057
Operating expenses	571,519	628,279
Electric utility operating expenses	559,300	615,712
Hydroelectric power production expenses	58,562	64,834
Thermal power production expenses	388,300	415,484
Purchased power from other suppliers	6,588	17,110
Transmission expenses	23,485	33,540
Transformation expenses	6,175	5,756
Selling expenses	970	1,036
Communicating expenses	4,342	4,340
General and administrative expenses	62,998	63,434
Expenses for third party's power transmission service	179	2,195
Enterprise tax	7,697	7,980
Incidental business operating expenses	12,219	12,567
Operating expenses-consulting business	1,165	1,713
Operating expenses-coal sale business	10,295	10,089
Operating expenses-other businesses	759	764
Operating income	43,071	18,678

(Unit: million yen)

	FY2017 (Apr.-Mar)	FY2018 (Apr.-Mar)
Non-operating income	27,036	51,469
Financial revenue	25,846	46,227
Dividend income	25,000	45,532
Interest income	846	695
Non-operating revenue	1,190	5,242
Gain on sales of non-current assets	12	0
Miscellaneous revenue	1,177	5,241
Non-operating expenses	17,648	15,742
Financial expenses	14,526	13,569
Interest expenses	14,159	13,118
Bond issuance cost	366	451
Non-operating expenses	3,122	2,172
Loss on sales of non-current assets	1	6
Miscellaneous loss	3,120	2,166
Total ordinary revenue	641,628	698,428
Total ordinary expenses	589,168	644,022
Ordinary income	52,460	54,405
Extraordinary loss	3,205	-
Impairment loss	3,205	-
Profit before income taxes	49,254	54,405
Income taxes-current	10,350	3,278
Income taxes-deferred	(3,033)	(1,657)
Total income taxes	7,316	1,621
Profit	41,938	52,784

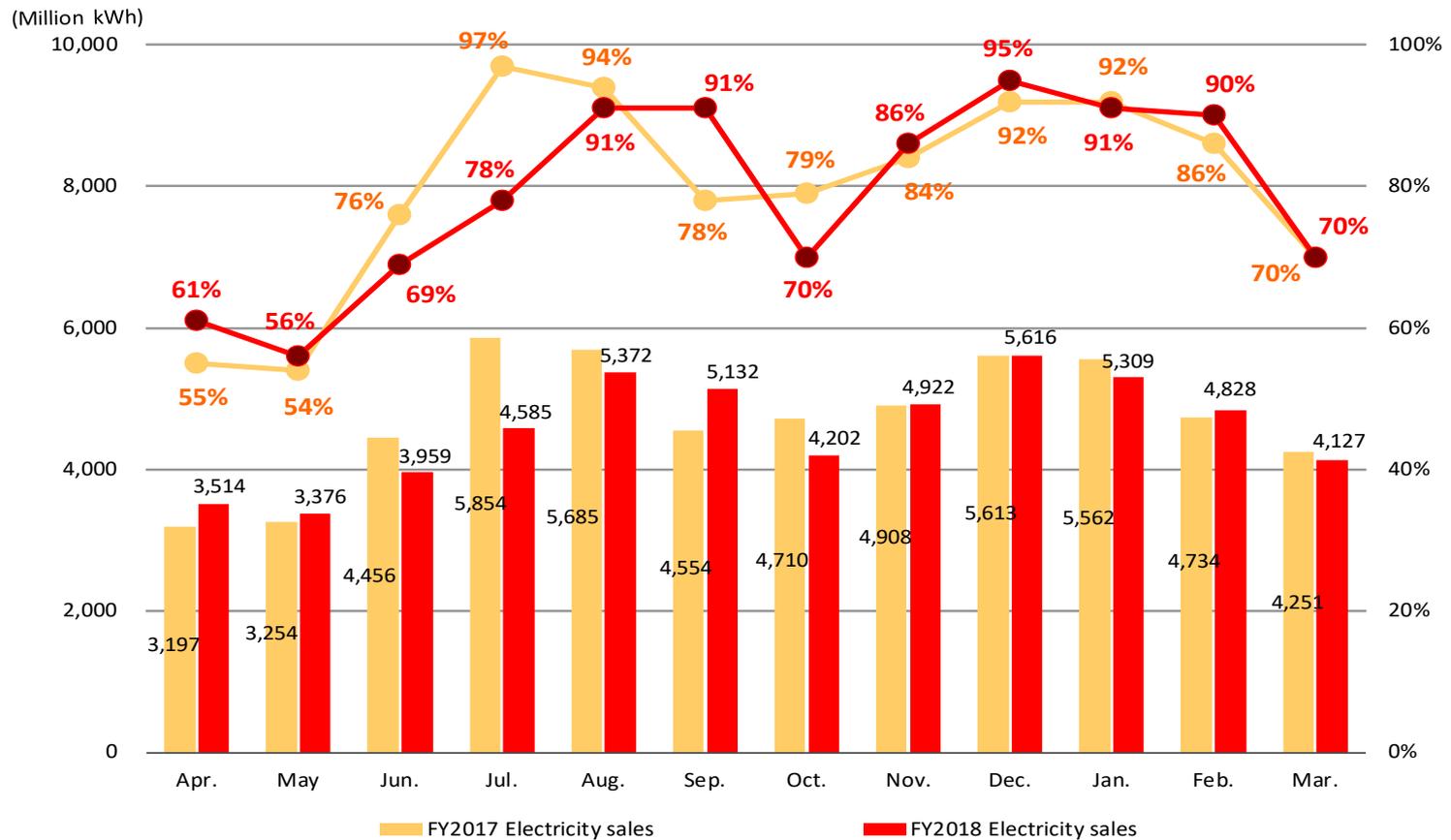
(1)-8. Monthly Electricity Sales:

Domestic Power Generation Business (Thermal Power)



▶ Apr. 2017 - Mar. 2018 Results (Cumulative)
 Load factor ⇒ 80%
 Electricity sales ⇒ 56.7TWh

▶ Apr. 2018 - Mar. 2019 Results (Cumulative)
 Load factor ⇒ 79%
 Electricity sales ⇒ 54.9TWh



* Load factors of thermal power show the results for non-consolidated only.

* Proportion of equity holding is not taken into account.

(1)-8. Monthly Electricity Sales:



Domestic Power Generation Business (Hydroelectric Power)

▶ Apr. 2017 - Mar. 2018 Results (Cumulative)

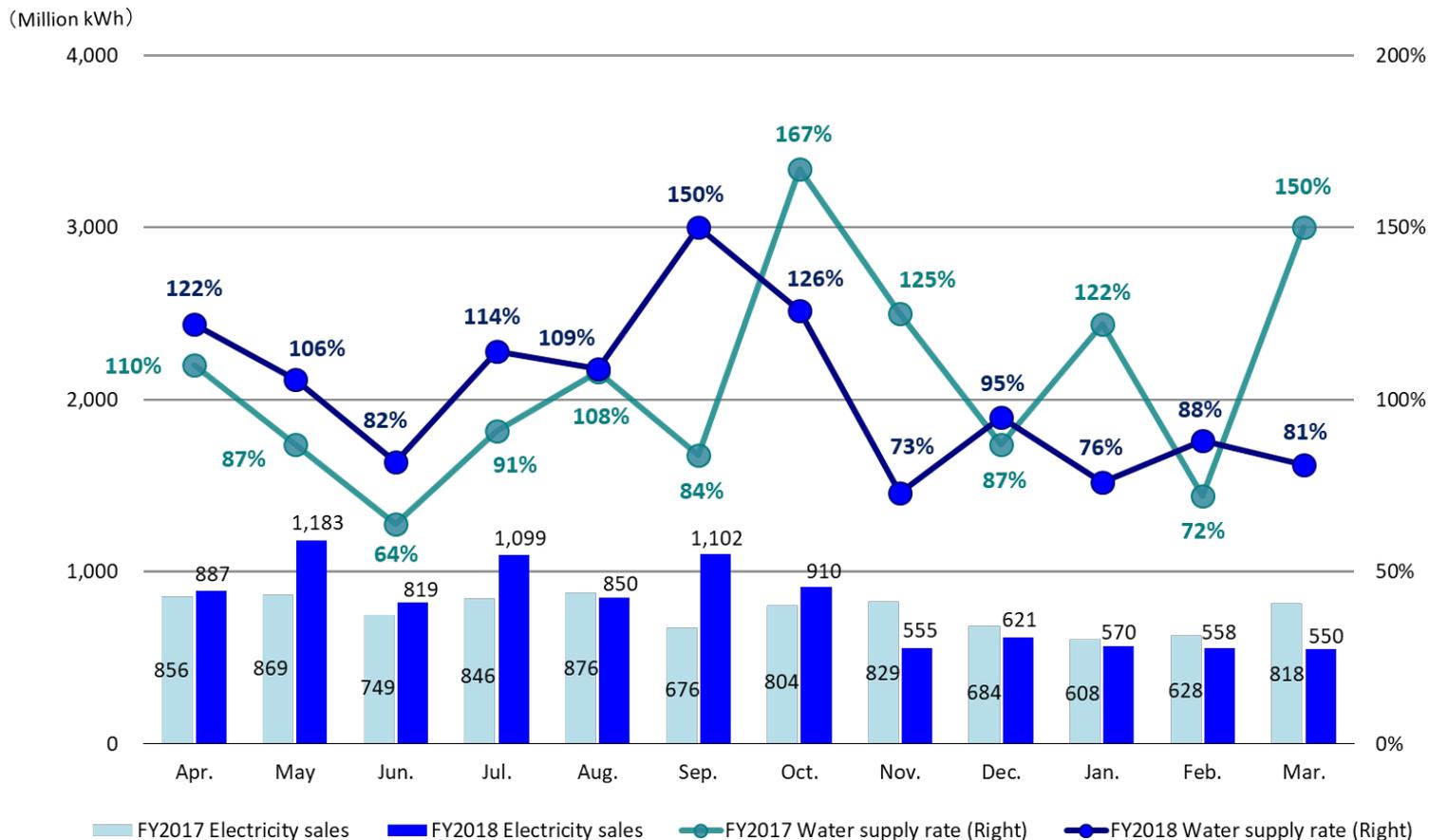
Water supply rate ⇒ 105%

Electricity sales ⇒ 9.2 TWh

▶ Apr. 2018 - Mar. 2019 Results (Cumulative)

Water supply rate ⇒ 106%

Electricity sales ⇒ 9.7 TWh

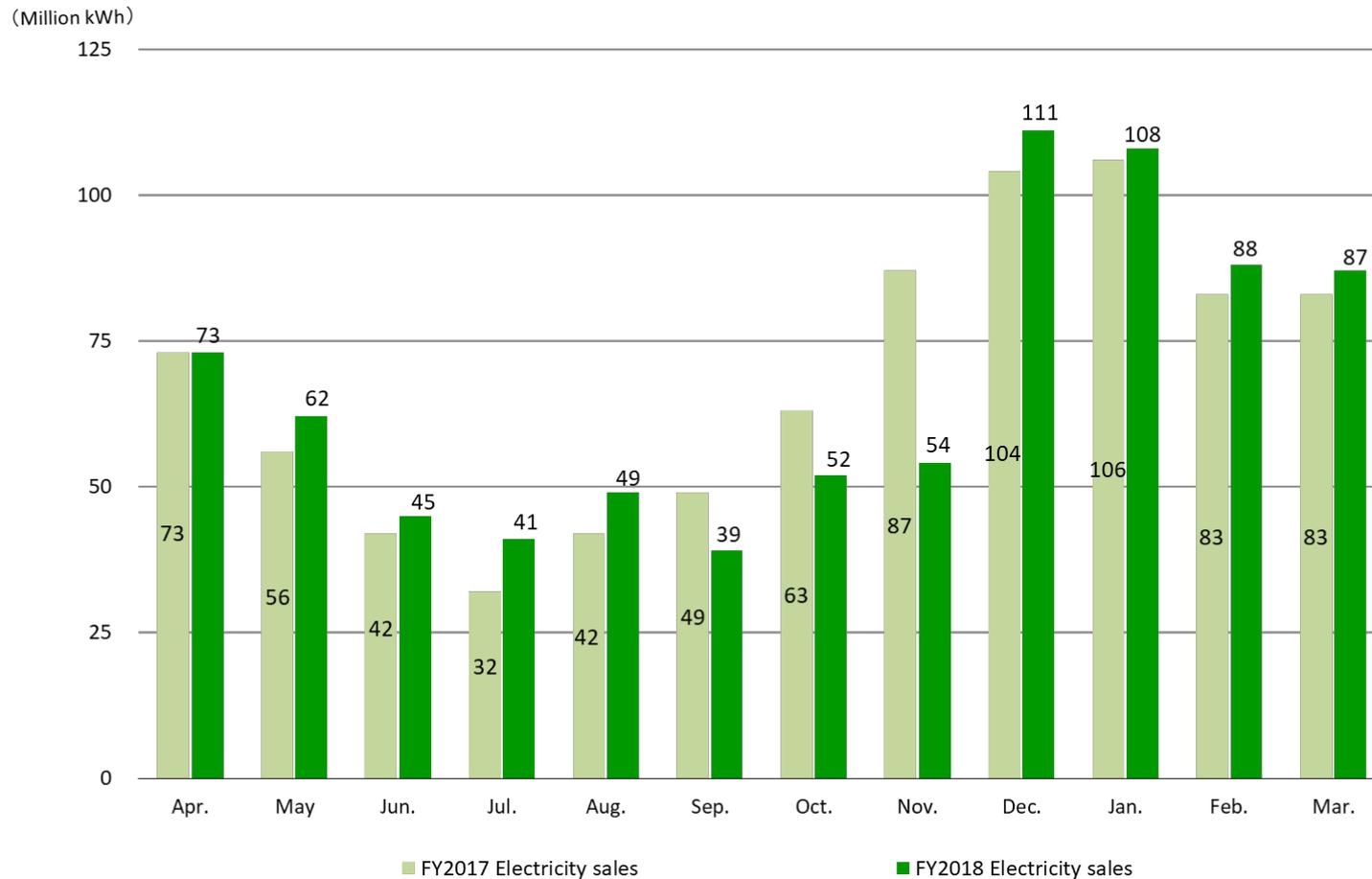


(1)-8. Monthly Electricity Sales:

Domestic Power Generation Business (Wind Power)



- ▶ Apr. 2017 - Mar. 2018 Results (Cumulative) ⇒ 0.82TWh
- ▶ Apr. 2018 - Mar. 2019 Results (Cumulative) ⇒ 0.81TWh



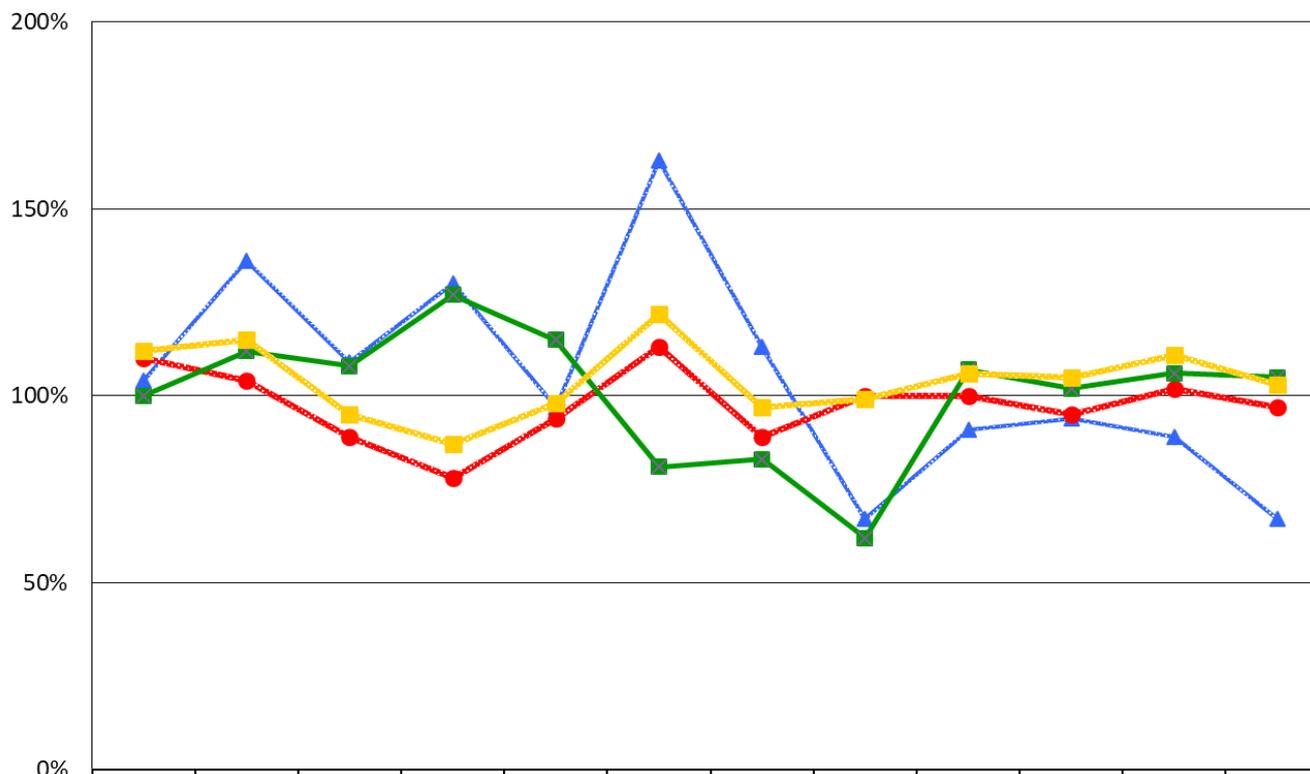
* Proportion of equity holding is not taken into account.

(1)-8. Change in Monthly Electricity Sales:

Domestic Power Generation Business



- ▶ Apr. 2017 - Mar. 2018 Total Results (Cumulative) ⇒ 67.0TWh
- ▶ Apr. 2018 - Mar. 2019 Total Results (Cumulative) ⇒ 69.3TWh



	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr. - Mar.
Year-on-year (Hydro)	104%	136%	109%	130%	97%	163%	113%	67%	91%	94%	89%	67%	105%
Year-on-year (Thermal)	110%	104%	89%	78%	94%	113%	89%	100%	100%	95%	102%	97%	97%
Year-on-year (Wind)	100%	112%	108%	127%	115%	81%	83%	62%	107%	102%	106%	105%	99%
Year-on-year Total	112%	115%	95%	87%	98%	122%	97%	99%	106%	105%	111%	103%	103%

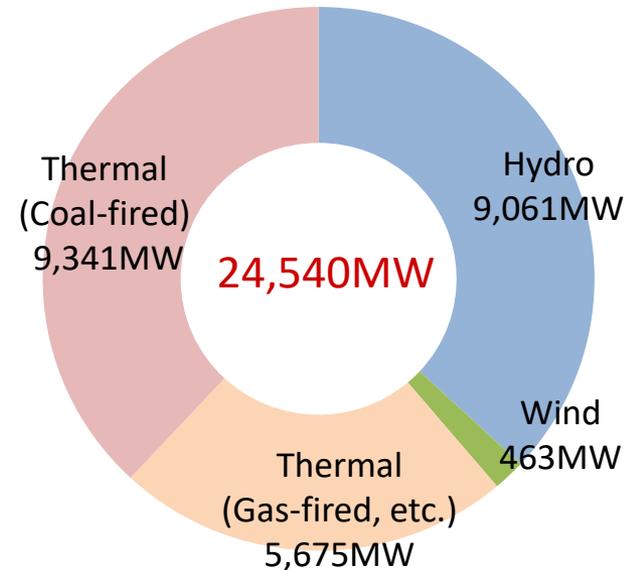
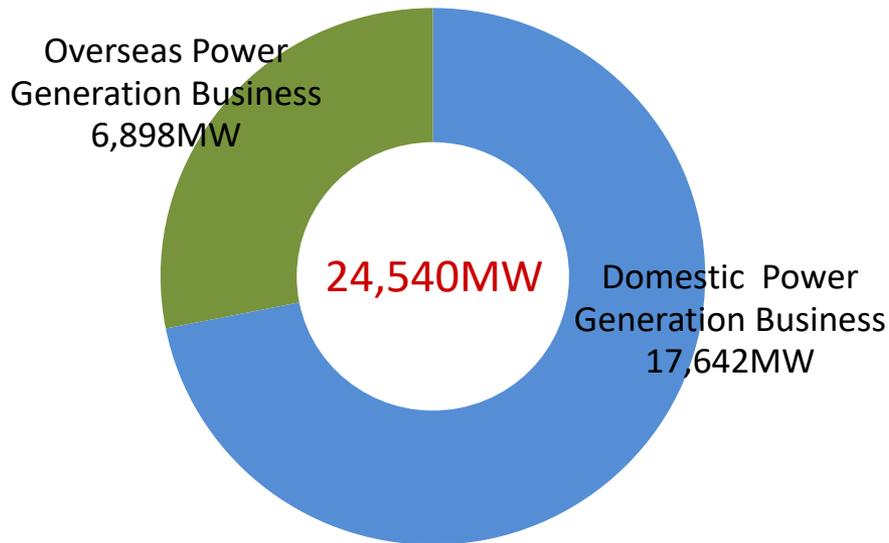
* Total volume includes electricity sales volume of hydro, thermal, wind and electricity procured from wholesale electricity market, etc.

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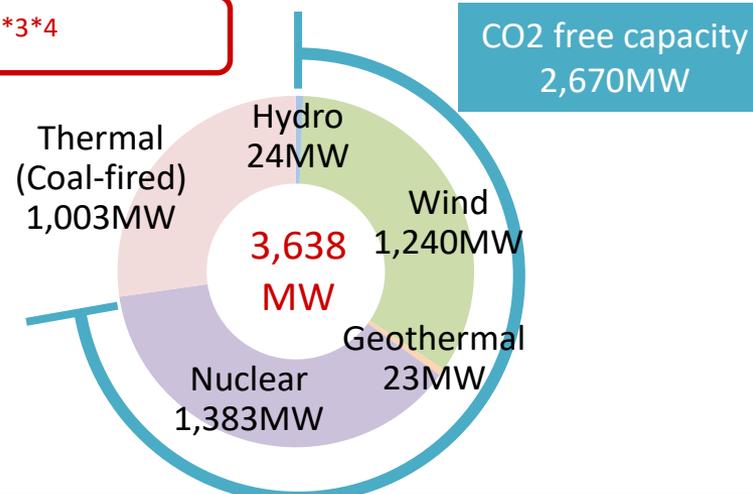
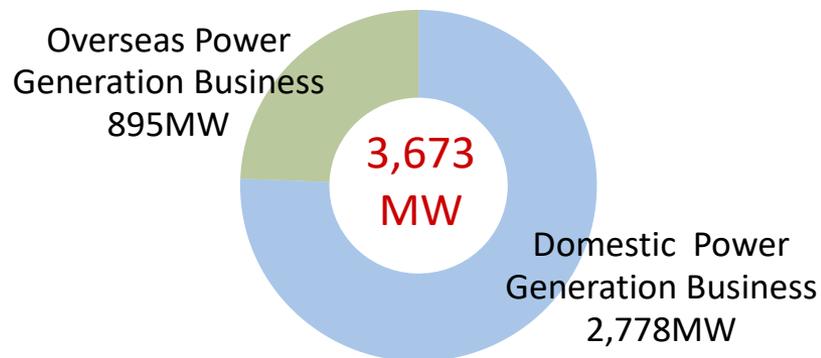
(2)-1. Overview of J-POWER Group Power Generation Facilities

Consolidated Power Generation Capacity*1

(As of March 31, 2019)



Development Projects*1*2*3*4



*1 Capacity figures show owned capacity which takes into account of equity ratio *2 Excluding replacement projects with no capacity change
 *3 In case capacity is to be determined, maximum capacity at environmental impact assessment is used *4 Yamaguchi Ube Power is excluded due to plan review

(2)-2. Domestic Electric Power Business Facilities (As of March 31, 2019)



Thermal (J-POWER): 7 power plants, 8,162MW

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

Thermal (Others): 4 power plants, 383MW*1

Power plant	Location	Fuel	Ownership	Output capacity (MW)
J-POWER Supply and Trading Ichihara	Chiba	Gas	100%	108
Mihama Seaside Power Shinminato	Chiba	Gas	100%	105
Itoigawa	Niigata	Coal	64%	149
Tosa	Kochi	Coal	45%	167

*1 Owned capacity: Output capacity of each facility is multiplied by J-POWER's investment ratio (equity ratio).

*2 Takehara No.1 was abolished for replacement in April, 2018.

(2)-2. Domestic Electric Power Business Facilities (As of March 31, 2019)

Hydroelectric: 61 power plants, 8,575MW*1

Power plant	Location	Beginning of operation	Capacity (MW)
Shimogo	Fukushima	1988	1,000
Okutadami	Fukushima	1958	560
Otori	Fukushima	1963	182
Tagokura	Fukushima	1959	400
Okukiyotsu	Niigata	1978	1,000
Okukiyotsu No.2	Niigata	1996	600
Numappara	Tochigi	1973	675
Shintoyone	Aichi	1972	1,125
Sakuma	Shizuoka	1956	350
Miboro	Gifu	1961	215
Nagano	Fukui	1968	220
Tedorigawa No.1	Ishikawa	1979	250
Ikehara	Nara	1964	350
Sendaigawa No.1	Kagoshima	1965	120
Other 47 plants			

Wind Power: 22 wind farms, 439MW*2

Wind farm	Location	Ownership	Output capacity (MW)
Tomamae Winvilla	Hokkaido	100%	30.6
Kaminokuni	Hokkaido	100%	28.0
Green Power Kuzumaki	Iwate	100%	21.0
Nikaho Kogen	Akita	100%	24.8
Koriyama-Nunobiki Kogen	Fukushima	100%	66.0
Hiyama Kogen	Fukushima	100%	28.0
Irouzaki	Shizuoka	100%	34.0
Tahara Bayside	Aichi	100%	22.0
Awara-Kitagata	Fukui	100%	20.0
Minami Ehime	Ehime	100%	28.5
Minami Oosumi	Kagoshima	100%	24.7
Other 11 wind farms			

*1 Including 3,275MW of pure pumped storage type.

*2 Owned capacity: Output capacity of each facility is multiplied by J-POWER's investment ratio (equity ratio).

(2)- 3. Overseas Power Generation Projects (As of March 31, 2019)



Project	Type	Output capacity (MW)	Ownership	Owned capacity (MW)	Power purchaser	Purchase agreement valid through
Thailand (16 projects)		5,947		3,300		
Roi-Et	Biomass (Chaff)	10	24.7%	2	EGAT*1	2024
Rayong	CCGT*3	112	20%	22	EGAT*1/ Companies in the industrial park	2024
Gulf Cogeneration	CCGT*3	110	49%	54	EGAT*1/ Companies in the industrial park	2019
Samutprakarn	CCGT*3	117	49%	57	EGAT*1/ Companies in the industrial park	2020
Nong Khae	CCGT*3	120	49%	59	EGAT*1/ Companies in the industrial park	2021
Yala	Biomass (Rubber wood waste)	20	49%	10	EGAT*1	2031
Kaeng Khoi 2	CCGT*3	1,468	49%	719	EGAT*1	2033
7 SPPs*2	Consolidated Subsidiaries	790	57.7%	456	EGAT*1/ Companies in the industrial park	2038
Nong Saeng		1,600	60%	960	EGAT*1	2039
U-Thai		1,600	60%	960	EGAT*1	2040
United States (11 projects)		5,430		2,016		
Tenaska Frontier	CCGT*3	830	31%	257	Exelon Generation Company, LLC	2020
Elwood Energy	SCGT*4	1,350	50%	675	PJM market	-
Green Country	CCGT*3	795	50%	398	Exelon Generation Company, LLC	2022
Birchwood	Coal	242	50%	121	Virginia Electric and Power Company	2021
Pinelawn	CCGT*3	80	50%	40	Long Island Power Authority	2025
Equus	SCGT*4	48	50%	24	NYISO market	-
Fluvanna	CCGT*3	885	15%	133	Shell Energy North America	2024
Edgewood	SCGT*4	88	50%	44	Long Island Power Authority	2023
Shoreham	Jet Fuel (Simple cycle)	90	50%	45	Long Island Power Authority	2020
Orange Grove	SCGT*4	96	50%	48	San Diego Gas & Electric	2035
Westmoreland	CCGT*3	926	25%	232	PJM market	-

*1 EGAT(Electricity Generating Authority of Thailand): State-owned electric power utility in Thailand

*2 7 SPP projects (KP1,KP2,TLC,NNK,NLL,CRN,NK2). J-POWER holds 45% stake in NLL and 60% stake in other 6 plants.

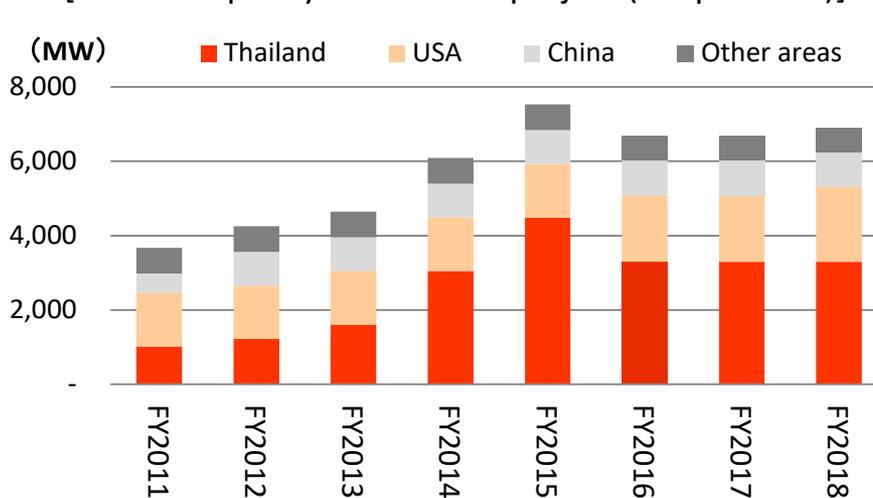
*3 CCGT: Combined Cycle Gas Turbine *4 SCGT: Simple Cycle Gas Turbine

(2)- 3. Overseas Power Generation Projects (As of March 31, 2019)



Project	Type	Output capacity (MW)	Ownership	Owned capacity (MW)	Power purchaser	Purchase agreement valid through
China (4 projects)		8,953		926		
Hanjiang (Xihe/Shuhe)	Hydroelectric	450	27%	122	Shaanxi Electric Power Company	Renewed every year* ¹
Gemeng* ²	Mainly Coal	6,413	7%	449	Shanxi Province Power Corporation	-
Hezhou	Coal	2,090	17%	355	Guanxi Power Grid Co.	Renewed every year* ¹
Other country/region (5 projects)		1,446		656		
CBK (3 projects) (Philippines)	Hydroelectric	728	50%	364	National Power Corporation	2026
Chiahui (Taiwan)	CCGT* ³	670	40%	268	Taiwan Power Company	2028
Zajaczkowo (Poland)	Wind Power	48	50%	24	ENERGA OBROT S.A.	2023

[Owned capacity of overseas project (in operation)]



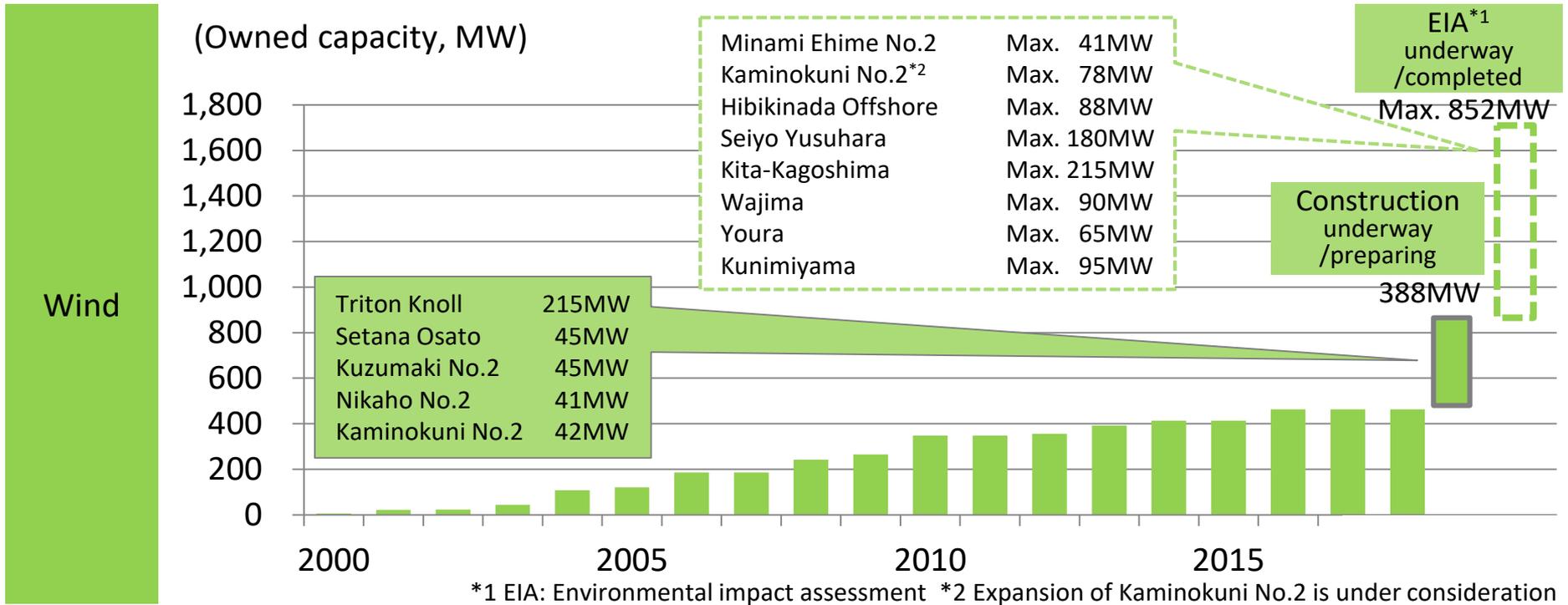
Country/Region	In operation	Under development	Total
Thailand	3,300	-	3,300
USA	2,016	-	2,016
China	926	-	926
Other areas	656	895	1,551
Total	6,898	895	7,793

*1 Although power purchase agreements are renewed every year, J-POWER makes other agreements with power purchasers for continuous power purchase during the plant operation.

*2 Gemeng International Energy Co., Ltd. is an electric power company that owns 13 power generation companies.

*3 CCGT: Combined Cycle Gas Turbine

(2)-4. Renewable Energy Development Projects



Hydro

Project	Capacity	Note
Shinkatsurazawa/ Kumaoui	21.9MW	Start of operation : FY2022 (planned)
Ashoro Repowering	40.0→42.3MW	Completion of repowering : FY2022 (planned)

Geo-thermal

Project	Capacity	Equity ratio	Owned capacity	Start of operation
Wasabizawa	42MW	50%	21MW	FY2019 (planned)
Onikobe Replacement	14.9MW	100%	14.9MW	FY2023 (planned)
Appi	14.9MW	15%	2.2MW	Around spring in 2024 (planned)

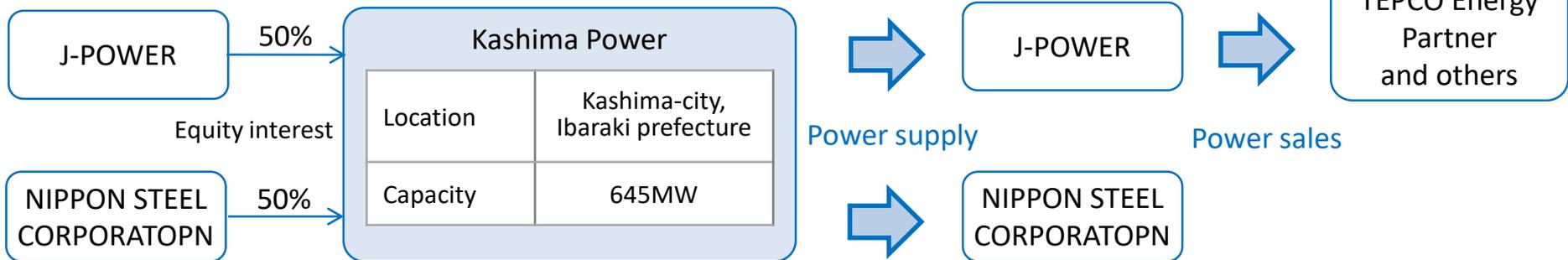
(2)-5. New Coal-fired Power Projects in Japan

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

Location	Takehara-city, Hiroshima prefecture
Status	Under construction
Start of operation	Scheduled for June 2020
Capacity	600MW (Unit No.1 &2) → 600MW (New Unit No.1) (Replacement in the same capacity)
Steam Condition	Sub-Critical → Ultra-supercritical

Kashima Power (New Capacity)

- ✓ Status : Under construction (Commenced in November 2016)
- ✓ Start of operation : Scheduled for July 2020



Yamaguchi Ube Power (New Capacity)

- ✓ The development plan for Yamaguchi Ube Power Project is to be reviewed due to withdrawal of one of the partners

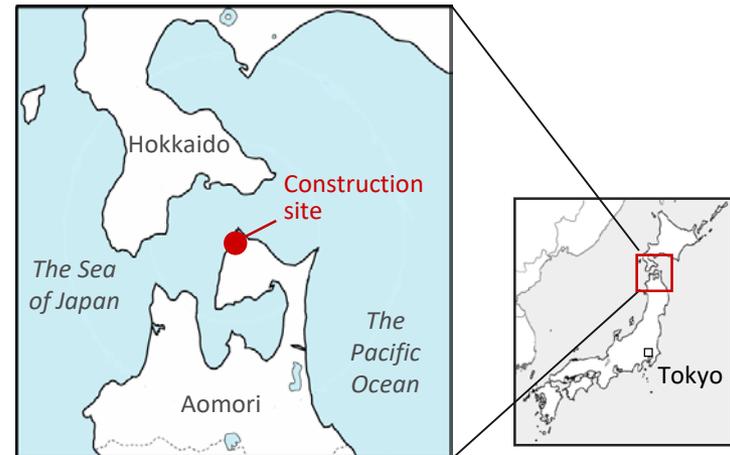
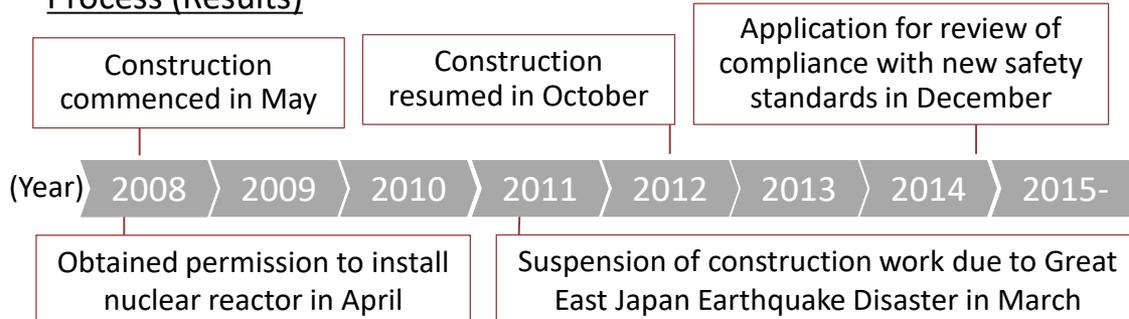
(2)-6. Ohma Nuclear Power Project

- 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
- 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 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)
Commencement of operations	To be determined

Process (Results)



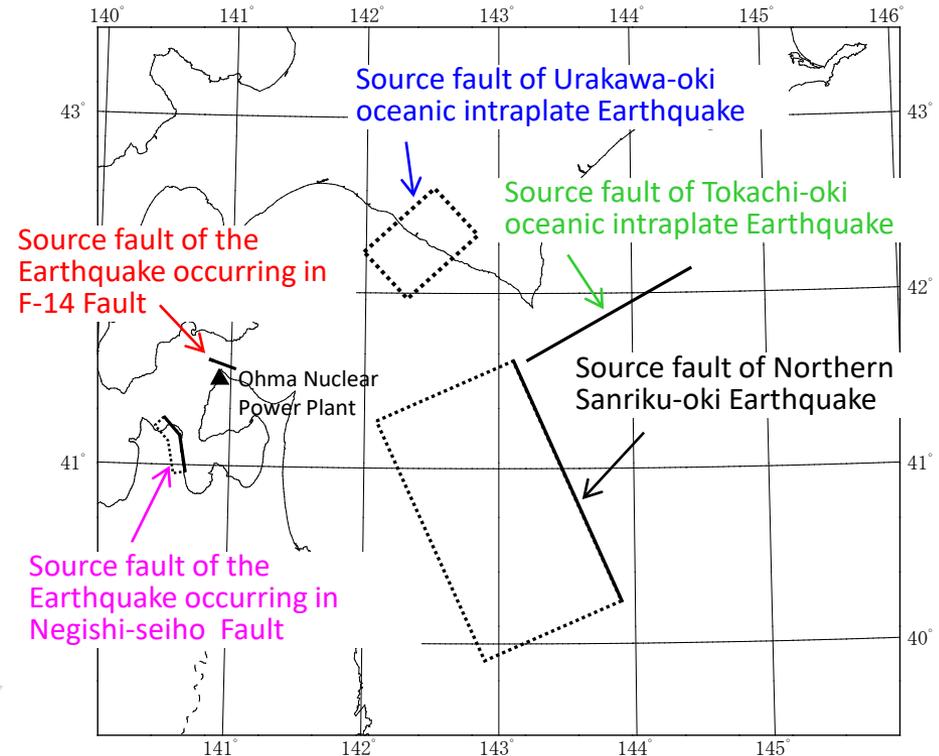
* Nuclear Regulatory Authority

Earthquakes for Investigation

✓ Earthquakes listed below by earthquake type have been investigated

Earthquake type	Earthquake for investigation	Magnitude
Interplate earthquakes	Northern Sanriku-oki Earthquake*	Mw8.3
Oceanic intraplate earthquakes	Urakawa-oki oceanic intraplate Earthquake	M7.5
	Tokachi-oki oceanic intraplate Earthquake	M8.2
Inland crustal earthquakes	Earthquake occurring in Negishi-seiho Fault	M7.5
	Earthquake occurring in F-14 Fault	M6.7

* Evaluation considering uncertainty of simultaneous rupture of north-off Sanriku area and off Tokachi and off Nemuro areas along Kuril trench (Mw9.0), based on experience of the 2011 off the Pacific coast of Tohoku Earthquake



Source faults of earthquakes for investigation

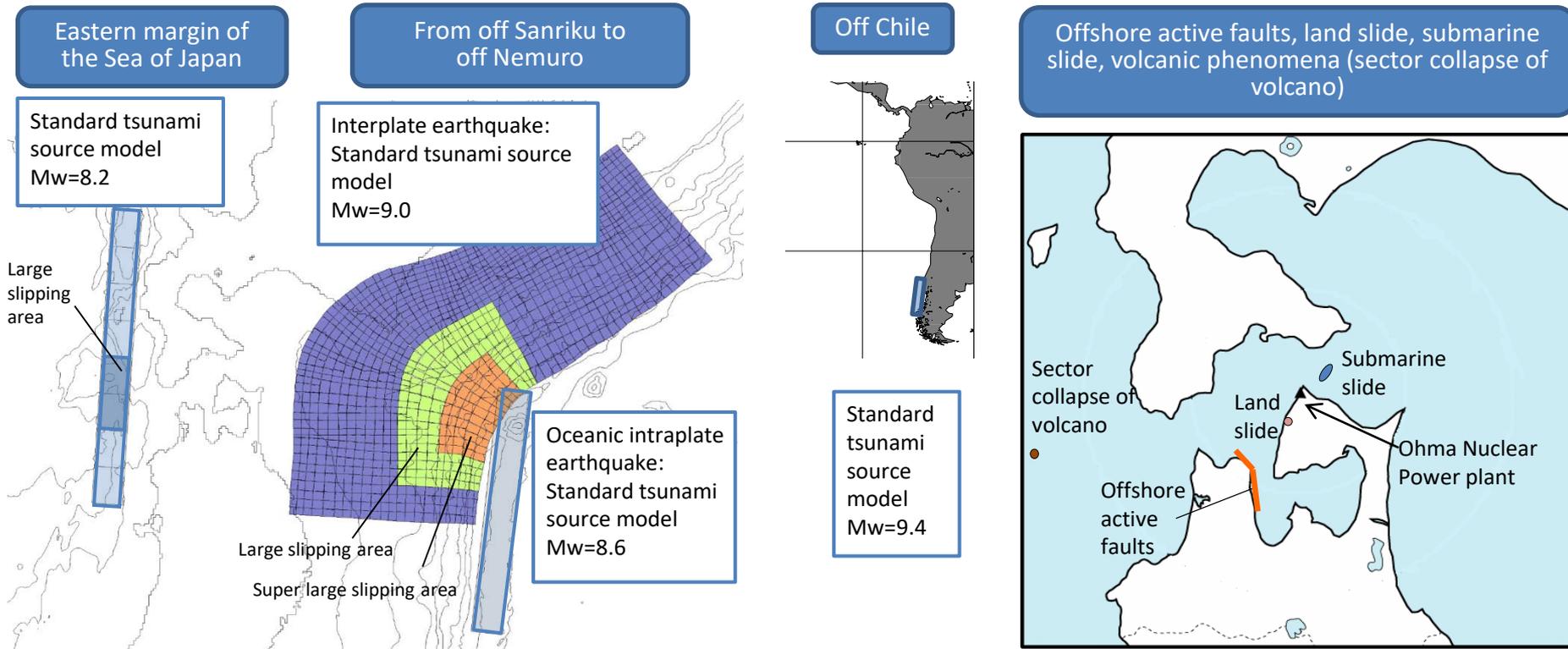


Standard seismic motion: Horizontal 650 cm/s²
(Maximum acceleration) Vertical 435 cm/s²

(2)-7. Response to the New Safety Standards at the Ohma Nuclear Power Plant (Main Conditions)

■ Design Basis Tsunamis

- ✓ Tsunami source models based on the latest knowledge such as the 2011 off the Pacific coast of Tohoku Earthquake Tsunami
- ✓ Estimated earthquakes larger than ever considered as tsunami sources at the eastern margin of the Sea of Japan, from off Sanriku to off Nemuro, off Chile and offshore active faults
- ✓ Taking into consideration of non-earthquake-oriented tsunamis (caused by land slide, submarine slide, sector collapse of volcano)



The highest sea water level by design basis tsunami: approx. T.P.+6.3m
The lowest sea water level by design basis tsunami: approx. T.P.-4.1m

(2)-8. Overseas Projects under Development (As of March 31, 2019)

Project

Overview

Location of the project

Central Java (Indonesia)

Capacity: 2,000MW
(1,000MW x 2)
Type: Coal (USC*1)
Ownership: 34%
Status: Under construction
Start of operation
No.1: Jun. 2020
No.2: Dec. 2020

- IPP project (newly developed coal-fired power plant) awarded through international tender in Indonesia in 2011.
- The plan is to construct a high-efficiency coal-fired power plant in Batang city, Central Java Province.
- After startup of operation, the plant will sell electricity to Indonesia's state-owned electric power utility for a period of 25 years.



Triton Knoll (UK)

Capacity: 860MW
Type: Offshore wind
Ownership: 25%
Status: Under construction
Start of operation: 2021

- Participating in an overseas offshore wind power project from the construction phase.
- A fixed price is guaranteed for 15 years under UK CfD regime.*2
- Taking advantage of the expertise regarding offshore wind power business obtained by participating in this project, J-POWER will accelerate its commitment to promoting its renewable energy business across the world, including Japan.



*1 USC: Ultra - Supercritical

*2 CfD regime: The CfD is an investment incentive program of UK, which will be granted to wind power generators and other low carbon electric power resources. Accredited electricity generators shall execute the CfD agreement with the LCCC (Low Carbon Contracts Company), a CfD management company owned by the British Government, and then, the parties thereto will make settlements for an electricity price based on the difference between the strike price, which is provided under the agreement, and the reference price, which is determined according to wholesale market prices from time to time.

(2)-9. Osaki CoolGen Project: Demonstration Test of Oxygen-blown IGCC

- Large-scale demonstration test on oxygen-blown IGCC, IGFC and CO₂ separation and capture to verify total system performance aiming for commercialization*

*This demonstration test is subsidized by the New Energy and Industrial Technology Development Organization (NEDO)

Company	Osaki CoolGen Corporation (Ownership: J-POWER 50%, Chugoku Electric Power Company 50%)		Output	166MW
Location	Chugoku Electric Power Company Osaki Power Station premises (Hiroshima)	Generation type	Oxygen-blown IGCC (Gas turbine: 1,300°C class)	



Demonstration Test Schedule

Fiscal year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Phase 1 : Demonstration of Oxygen-blown IGCC demonstration	Design/manufacture/installation					Demonstration tests					
Phase 2 : Demonstration of Oxygen-blown IGCC with CO ₂ separation and capture					Design/manufacture/installation			Demonstration tests			
Phase 3 : Demonstration of IGFC with CO ₂ separation and capture								Design/manufacture/installation		Demonstration tests	

Phase 1 demonstration tests completed in February 2019, achieving targets in all testing items

- ◆ Gross efficiency reached 48.1% (HHV), which stands at world top level as 170 MW-class demonstration plant
 - ⇒ Gaining perspective for gross efficiency far above 50% at an oxygen-blown IGCC commercial plant with 1500°C-class gas turbine, which enables CO₂ emission reduction by around 15% compared with USC (USC is currently the most efficient commercialized coal-fired thermal power)
- ◆ Results of load change rate approx. 16%/minute*¹ and stable operation at 0MW net output*² prove quick output control ability
 - ⇒ Demonstrating high flexibility in operation, which enables supplement for sudden output changes in renewables

- IGCC (Integrated Coal Gasification Combined Cycle): An integrated power generation system with a twin-turbine configuration; the gas produced from coal is used as fuel to drive a gas turbine, the exhaust gas from which and others is used to drive a steam turbine. There are oxygen-blown type and air-blown type depending on kind of gas supplied to gasifier when coal is gasified. Oxygen-blown IGCC is said to be more efficient when operated with CO₂ separation and capture facilities
- IGFC (Integrated Coal Gasification Fuel Cell Combined Cycle): Power generation system combining fuel cells with gas and steam turbines in a triply integrated configuration, which will be able to achieve the highest efficiency as a coal-fired generation technology

*1 Output change rate to rated load per minute. Larger figure shows higher ability of quick output change in response to change of electricity demand.

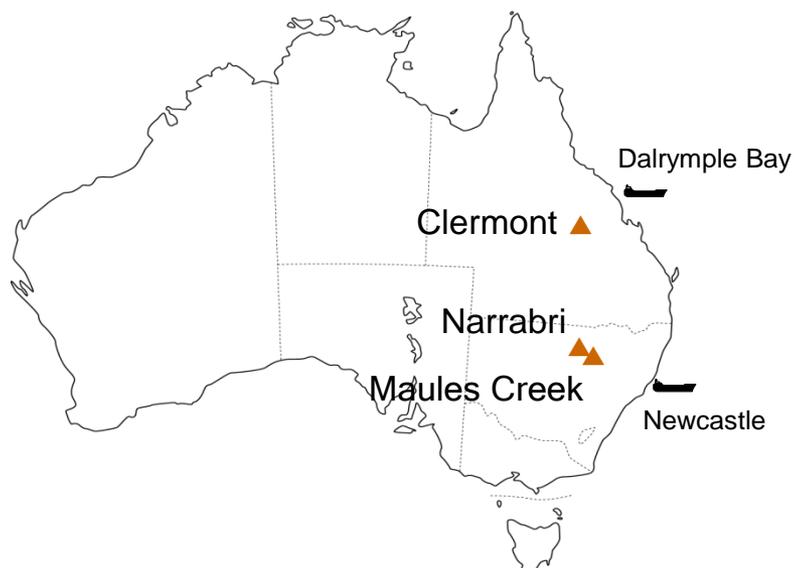
*2 Net output represents MW of generator minus MW consumed in the plant itself. 0MW net output means generating the same volume of electricity as consumed in the plant.

(2)-10. Coal Mine Projects in Australia

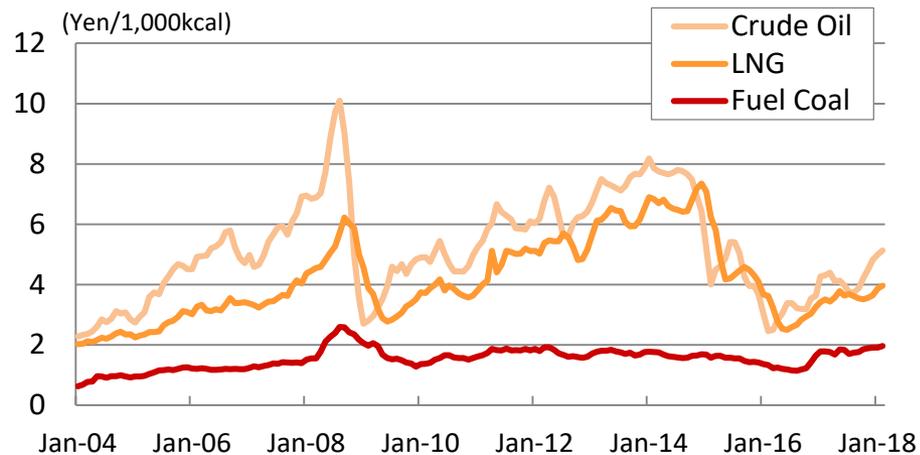
Coal Mine Projects

Coal mine	Location	Loading port	Production volume in 2018	Ownership* ¹	Start of commercial production
Clermont	Queensland	Dalrymple Bay	11.51 Million t	15%	2010
Narrabri	New South Wales	Newcastle	4.74 Million t	7.5%	2012
Maules Creek	New South Wales	Newcastle	9.34 Million t	10%	2014

*1 Investment through a subsidiary, J-POWER AUSTRALIA PTY. LTD.



Calorific Unit Price by Fossil Fuel (Imports) in Japan



Data charted up to February 2019
Source: The Institute of Energy Economics, Japan



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