FY2024 Second Quarter Investors Meeting

(Note) The company's fiscal year (FY) is from April 1 to March 31 of the following year in this material.
"2Q" refers to the period from April 1 to September 30.

JERA Co., Inc.

October 29, 2024

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Outline of Financial Results

Consolidated Statement of Profit or Loss

(Unit: Billion Yen)

	2024/2Q(A)	2023/2Q(B)	Change(A-B)	Rate of Change(%)
Revenue (Net sales)	1,651.0	2,097.3	-446.2	-21.3
Operating profit	197.3	427.7	-230.3	-53.9
Profit	138.9	291.2	-152.3	-52.3
<Reference> Profit excluding time lag	122.2	75.3	46.9	62.2

Consolidated Statement of Financial Position

(Unit: Billion Yen)

	As of Sep 30,2024 (A)	As of Mar 31,2024(B)	Change(A-B)	Rate of Change(%)
Assets	8,423.1	8,508.1	-84.9	-1.0
Liabilities	5,502.5	5,849.5	-347.0	-5.9
Equity	2,920.6	2,658.6	262.0	9.9

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Key Points of Financial Results

【Revenue】

- **Revenue decreased by 446.2 billion yen (down 21.3%) from the same period last year to 1,651.0 billion yen** mainly due to a decrease of income unit price in electrical energy sales.

【Profit】

- Profit **decreased by 152.3 billion yen from the same period last year 291.2 billion yen to 138.9 billion yen.**
  - ・The effect of time lag decreased.
    (-199.2 billion yen [215.9 billion yen to 16.6 billion yen])
  - ・Profit excluding time lag increased.
    (+46.9 billion yen [75.3 billion yen to 122.2 billion yen])
- Profit excluding the time lag increased mainly due to the improvement of impact on mainly fuel procurement price and the impact of fuel inventory unit prices although the profit from overseas power generation and renewable energy business and fuel business decreased.

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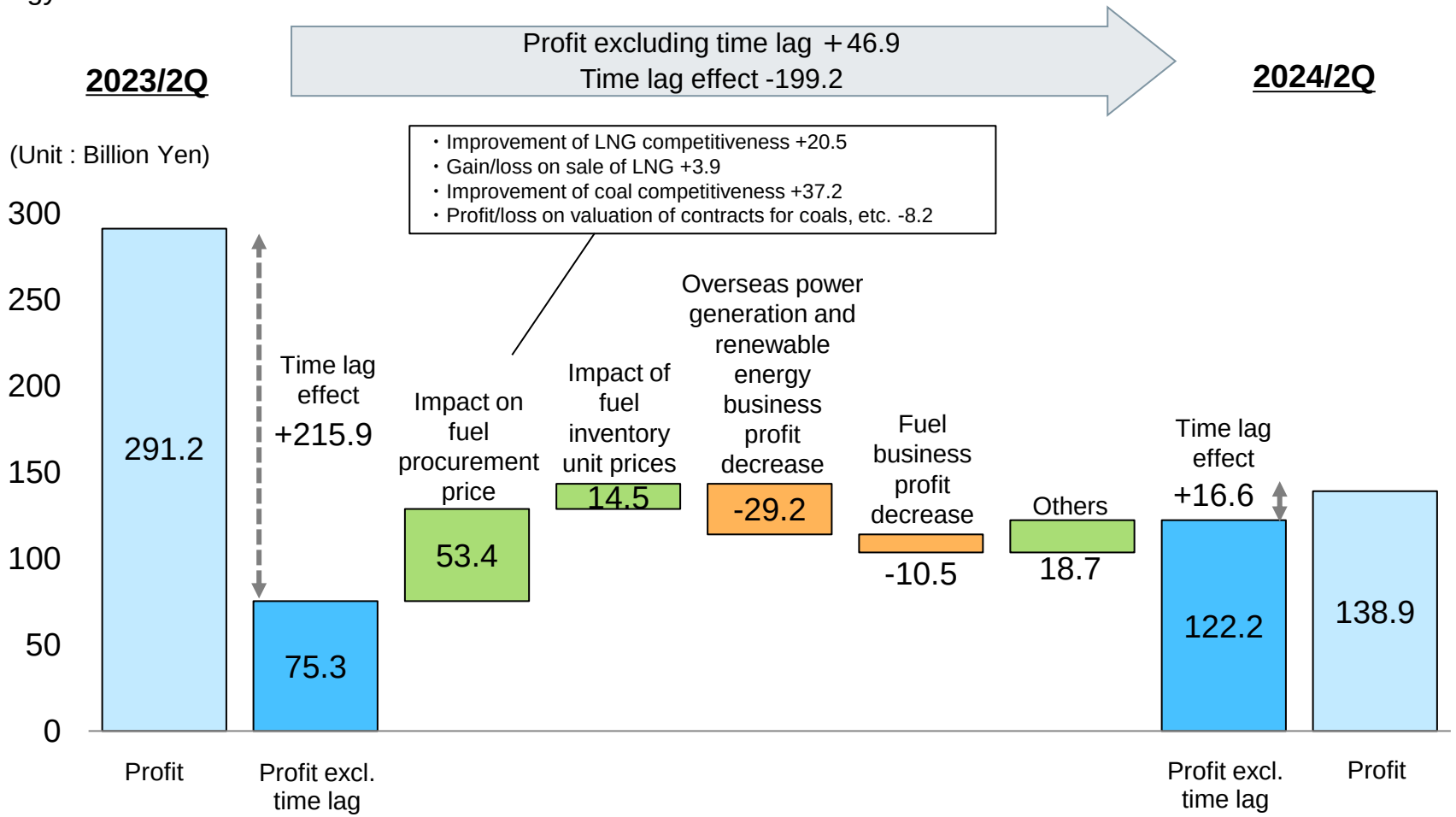
Change Factors of Consolidated Profit

- Profit excluding the time lag increased mainly due to the improvement of impact on mainly fuel procurement price and the impact of fuel inventory unit prices although the profit from overseas power generation and renewable energy business and fuel business decreased.



*Figures are after-tax.

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Consolidated Statement of Profit or Loss

(Unit: Billion Yen)

	2024/2Q(A)	2023/2Q(B)	Change(A-B)	Main Factors of Changes
Revenue (Net sales)	1,651.0	2,097.3	-446.2	• Decrease of income unit price in electrical energy sales
Operating expenses	1,485.5	1,708.4	-222.8	• Decrease of fuel costs
Other operating income/ loss	31.9	38.8	-6.9	• Equity method profit / loss -23.7 • Exchange income and loss +13.8
Operating profit	197.3	427.7	-230.3	
Financial income	48.3	37.6	10.6	• Increase of interest received +9.8
Financial costs	28.8	41.9	-13.0	• Exchange income and loss -17.4 • Increase of interest paid +4.6
Profit before tax	216.8	423.4	-206.6	• Decrease of time lag effect -276.7 (299.8→ 23.1) • Increase of profit excl. time lag +70.0 (123.6→193.7)
Income tax expense	44.5	87.5	-42.9	
Profit attributable to non-controlling Interests	33.3	44.7	-11.3	
Profit	138.9	291.2	-152.3	

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Consolidated Statement of Financial Position

(Unit: Billion Yen)

	As of Sep 30,2024 (A)	As of Mar 31,2024(B)	Change (A-B)	Main Factors of Changes
Cash and cash equivalents	1,335.6	1,405.3	-69.7	
Property, plant and equipment	2,877.8	2,805.4	72.4	
Investments accounted for using equity method	1,359.0	1,235.2	123.7	
Others	2,850.6	3,062.0	-211.4	• Decrease of derivative assets (JERAGM, etc.) -264.5
Assets	8,423.1	8,508.1	-84.9	
Interest-bearing liabilities	3,116.8	3,103.6	13.1	
Others	2,385.6	2,745.8	-360.1	• Decrease of derivative liabilities (JERAGM, etc.) -226.1
Liabilities	5,502.5	5,849.5	-347.0	
Equity attributable to owners of parent	2,835.6	2,632.6	203.0	• Profit +138.9 • Foreign currency translation adjustments +104.1
Non-controlling interests	85.0	25.9	59.0	
Equity	2,920.6	2,658.6	262.0	

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Consolidated Statement of Cash Flows

(Unit: Billion Yen)

		2024/2Q(A)	2023/2Q(B)	Change(A-B)
Operating cash flow		176.4	994.7	-818.2
Investment cash flow	Purchase of property, plant, and equipment	-79.1	-123.8	44.6
	Purchase of investment securities	-5.3	-57.8	52.5
	Others	-24.8	-228.6	203.8
		-109.3	-410.3	300.9
Free cash flows		67.1	584.4	-517.2
Financial cash flow	Increase (decrease) in interest-bearing debt	-15.9	-294.4	278.5
	Dividends paid *	-	-	-
	Others	-42.0	-96.3	54.2
		-57.9	-390.8	332.8

Increase (decrease)in cash and cash equivalents (minus indicates decrease)	-69.7	293.1	-362.8

* Excluding Dividends paid to non-controlling interests

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Segment Information

(Unit: Billion Yen)

	2024/2Q(A)		2023/2Q(B)		Change(A-B)		Main Factors of Changes in Profit / Loss (excl. time lag)
	Revenue	Profit / Loss	Revenue	Profit / Loss	Revenue	Profit / Loss	
Fuel	201.3	64.7	242.4	75.3	-41.1	-10.5	•Profit decrease in JERAGM, etc.
Overseas power generation and renewable energy	30.4	4.2	18.6	33.4	11.7	-29.2	•Gain on reversal of impairment loss in Formosa 2 in FY23 -19.6 •Profit decrease in overseas IPPs, etc -9.6
Domestic thermal power generation and gas	2,039.8	69.9 53.3※2	2,275.5	186.1 -29.7※2	-235.6	-116.1 83.1※2	•Improvement of LNG competitiveness +20.5 •Gain/loss on sale of LNG +3.9 •Improvement of coal competitiveness +37.2 •Profit/loss on valuation of contracts for coals, etc. -8.2 •Impact of fuel inventory unit prices +14.5
Adjustments※1	-620.5	-0.0	-439.3	-3.6	-181.2	3.5	
Consolidated	1,651.0	138.9 122.2※2	2,097.3	291.2 75.3※2	-446.2	-152.3 46.9※2	

※1 : “Adjustments” includes headquarter expenses and consolidation adjustments such as intersegment eliminations
※2 : Excluding the effect of time lag

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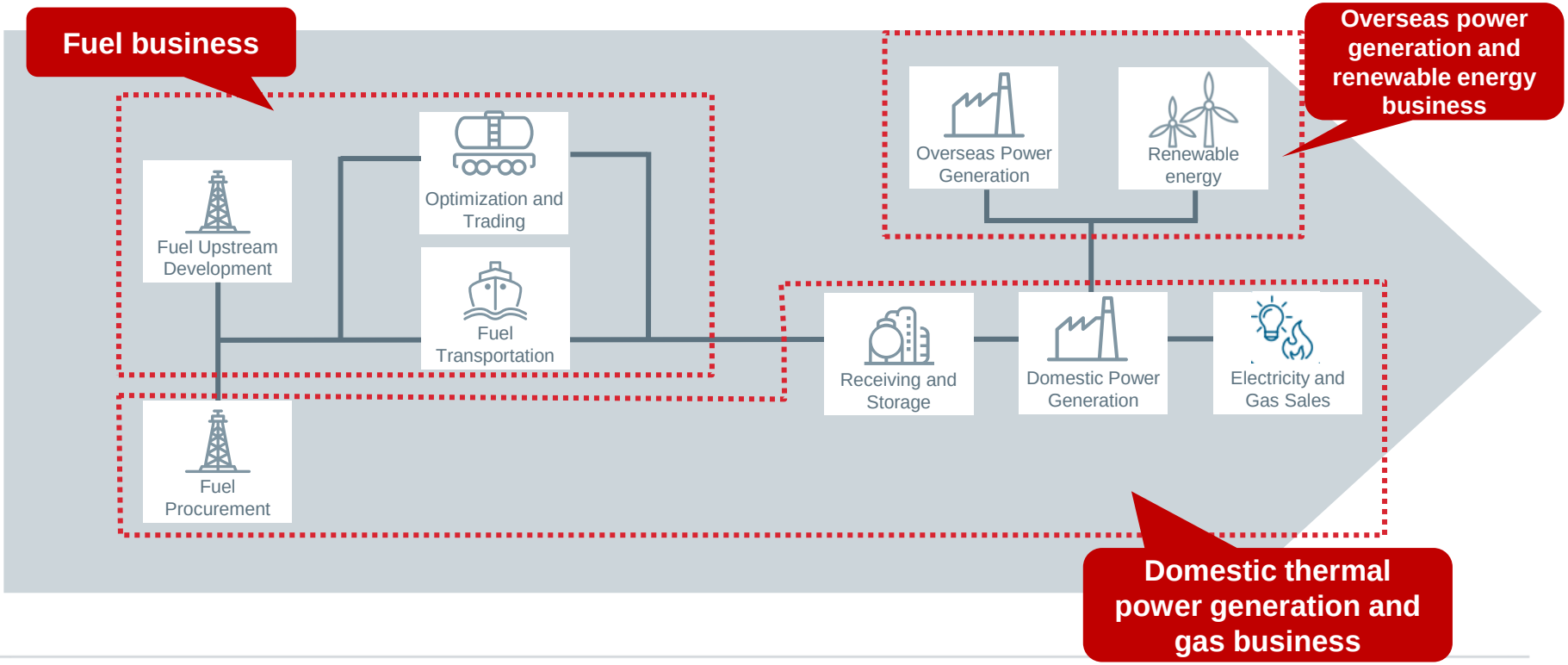
(Reference) : JERA's Value Chain and Segment

- JERA owns the entire supply chains for fuel and thermal power generation, from fuel upstream business (development of gas fields) to transportation and storage (fuel terminal operation) to power generation and wholesaling.
- We have three business segments; "Fuel business" for investment in fuel upstream, transportation and trading business, "Overseas power generation and renewable energy business" for investment in overseas power generation and domestic and overseas renewable energy business, and "Domestic thermal power generation and gas business" for sales of electricity and gas in Japan.



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FY2024 Forecast

- Profit excluding the time lag is expected to be around 150 billion yen, while time lag profit is projected to be 50 billion yen, with a total profit of around 200 billion yen. (No change from the previous forecast)
- Results may fluctuate due to changing trends in fuel markets and other factors.

(Unit: Billion Yen)

	Current Forecast(A)	Previous Forecast(B)	Change (A-B)	【Reference】 FY2023 Result
Profit	200.0	200.0	-	399.6
Time lag effect	50.0	50.0	-	250.9
Profit excl. time lag	150.0	150.0	-	148.7

[Breakdown for each segment]

(Unit: Billion Yen)

	Current Forecast(A)	Previous Forecast(B)	Change (A-B)	【Reference】 FY2023 Result
Profit excl. time lag	150.0	150.0	-	148.7
Fuel	100.0	100.0	-	132.6
Overseas power generation and renewable energy	10.0	20.0	-10.0	33.7
Domestic thermal power generation and gas	70.0	60.0	+10.0	4.4
Adjustments	-30.0	-30.0	-	-22.1

*Breakdown is based on rough estimates at the disclosure date.

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Appendix

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Key Elements

[2024/2Q Results]

	2024/2Q(A)	2023/2Q(B)	Change(A-B)
Electrical Energy Sold (TWh)	112.1	115.4	-3.3
Crude Oil Prices(JCC) (dollar/barrel)	86.7	83.6	3.1
Foreign Exchange Rate (yen/dollar)	152.6	141.0	11.6

Note: Crude Oil Prices(JCC) for 2024/2Q is tentative.

[FY2024 Forecast]

	Current Forecast	(Of these, from Oct onwards)	Previous Forecast	【Reference】 FY2023 Result
Crude oil prices(JCC) (dollar/barrel)	Approx.81	Approx.75	Approx.86	86.0
Foreign exchange rate (yen/dollar)	Approx.147	Approx.141	Approx.155	144.6

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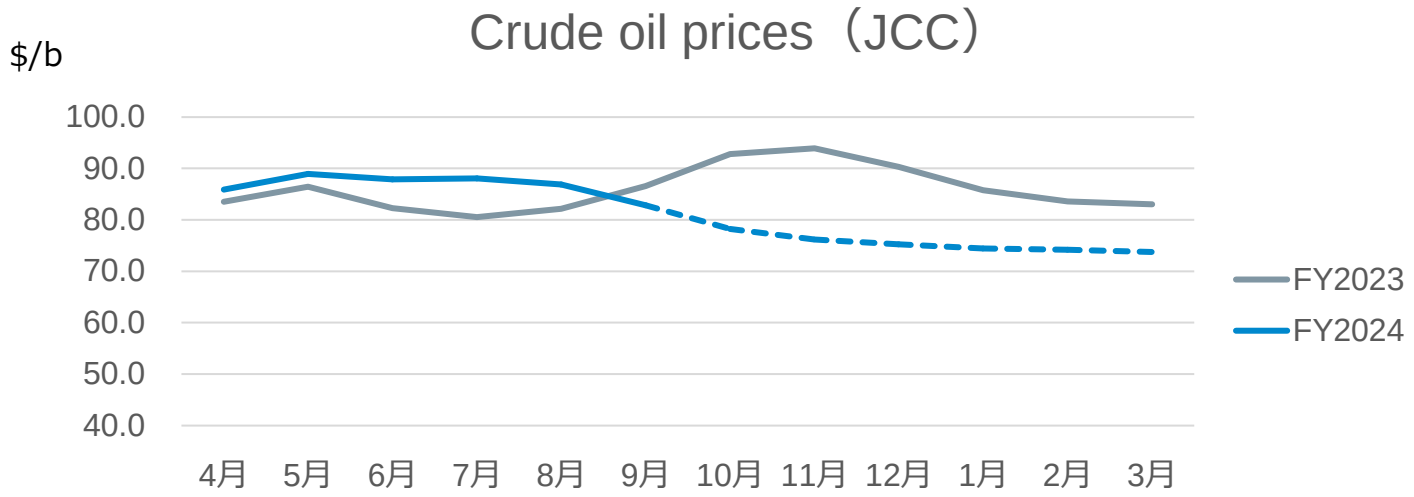
Trends in Crude Oil Price and Exchange Rates



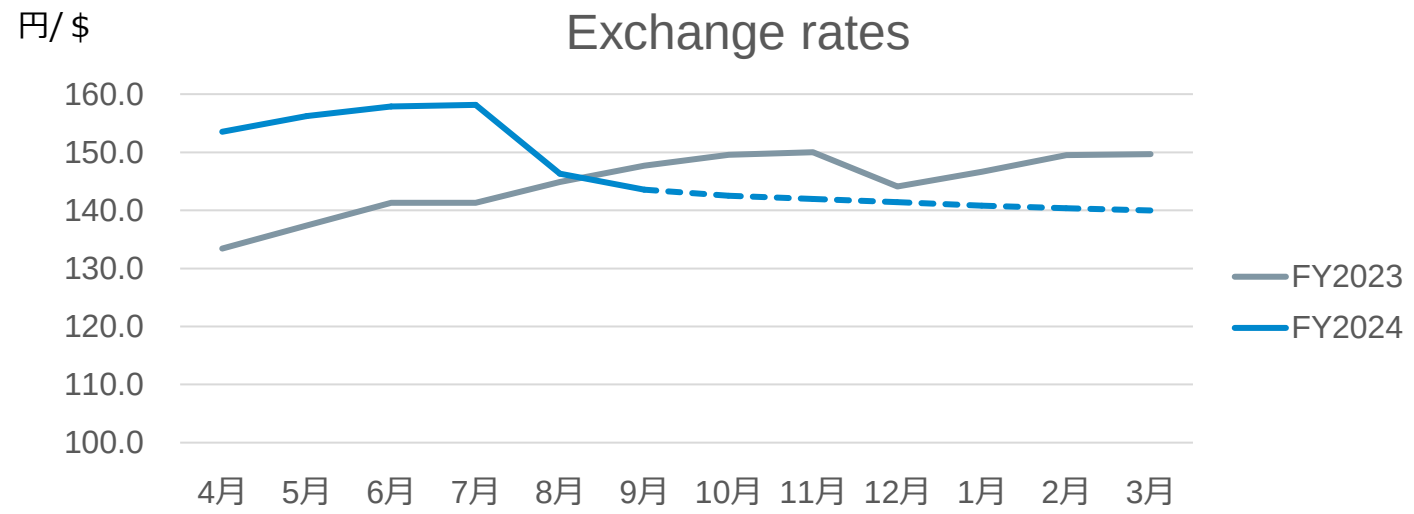


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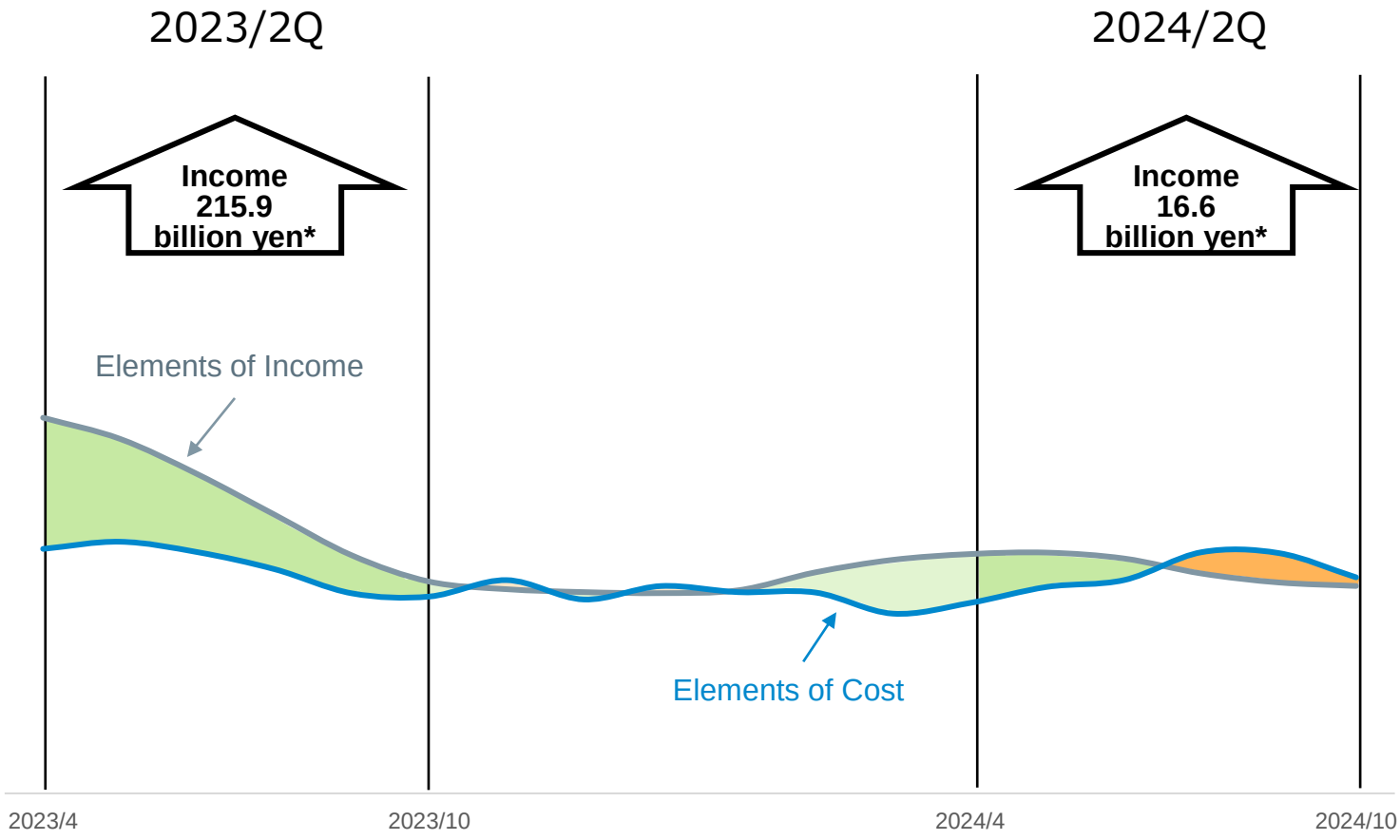
Image of Time Lag （2023/2Q－2024/2Q）

- Time lag is profits and losses due to the time difference between changes in fuel prices and their reflection in sales prices.
- The impact on profits and losses will be neutral in the medium to long term.



* Figures are after-tax amounts.

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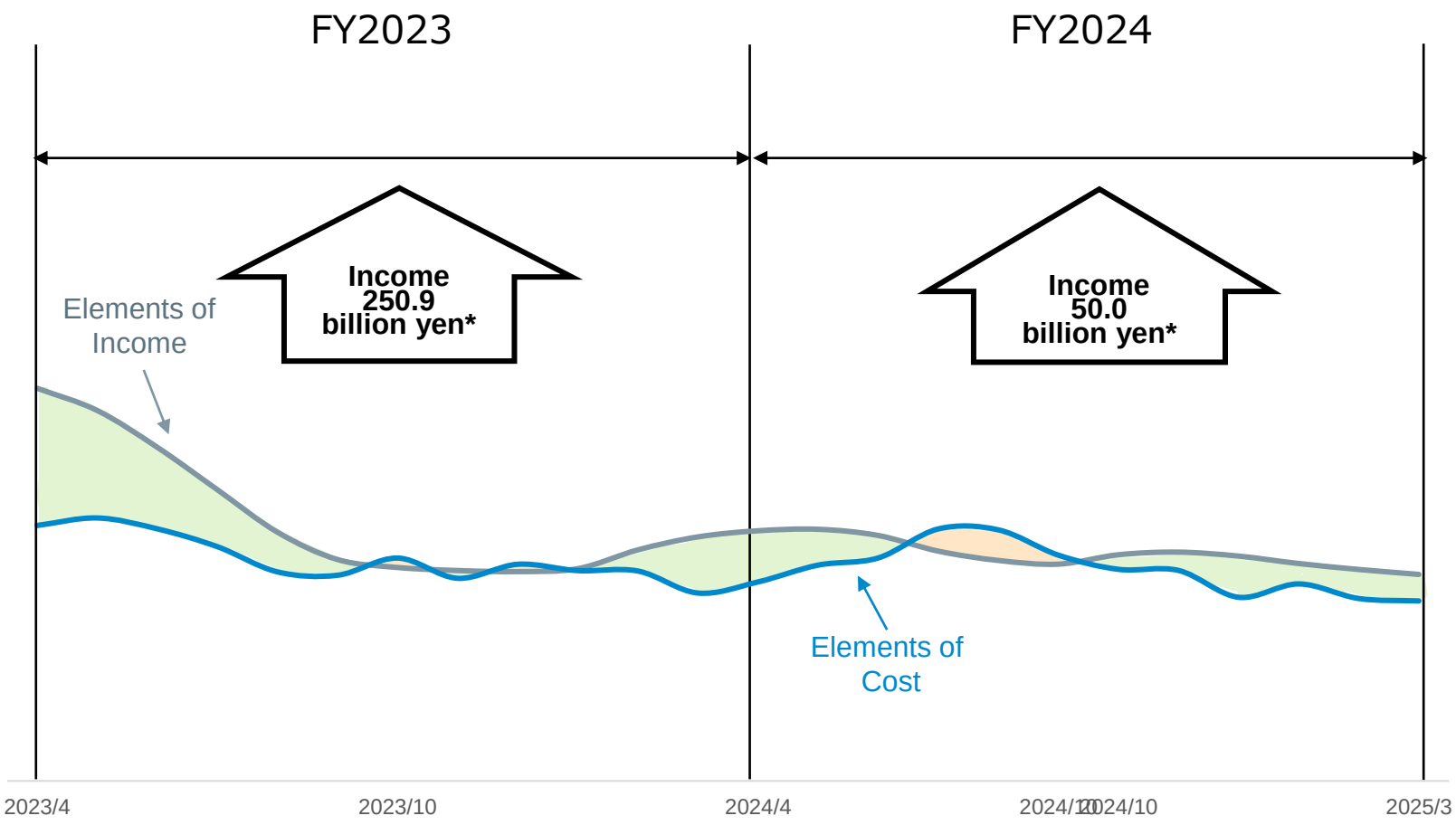
Image of Time Lag （FY2023－FY2024）



* Figures are after-tax amounts.

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Electrical Energy Sold and Electrical Power Generated

[Electrical Energy Sold(TWh)]

	Apr to Jun	Jul to Sep	Oct to Dec	Jan to Mar	Total
FY2024	45.9	66.2			112.1
FY2023	48.1	67.3	58.2	62.6	236.2

[Electrical Power Generated(TWh)]

		Apr to Jun	Jul to Sep	Oct to Dec	Jan to Mar	Total
FY2024		45.2	65.1			110.2
	LNG	33.0（73%）	48.1（74%）			81.1（74%）
	Coal	12.1（27%）	16.6（26%）			28.7（26%）
	Others	0.1（0%）	0.4（1%）			0.5（0%）
FY2023		47.5	66.2	55.0	62.2	230.9
	LNG	36.2（76%）	48.8（74%）	41.7（76%）	47.5（76%）	174.2 (75%)
	Coal	11.2（24%）	17.2（26%）	13.3（24%）	14.3（23%）	56.1 (25%)
	Others	0（0%）	0.1（0%）	0.1（0%）	0.4（1%）	0.6（0%）

*The total may not match due to rounding.

Note: Electrical Power Generated for Jul to Sep of FY2024 is tentative.

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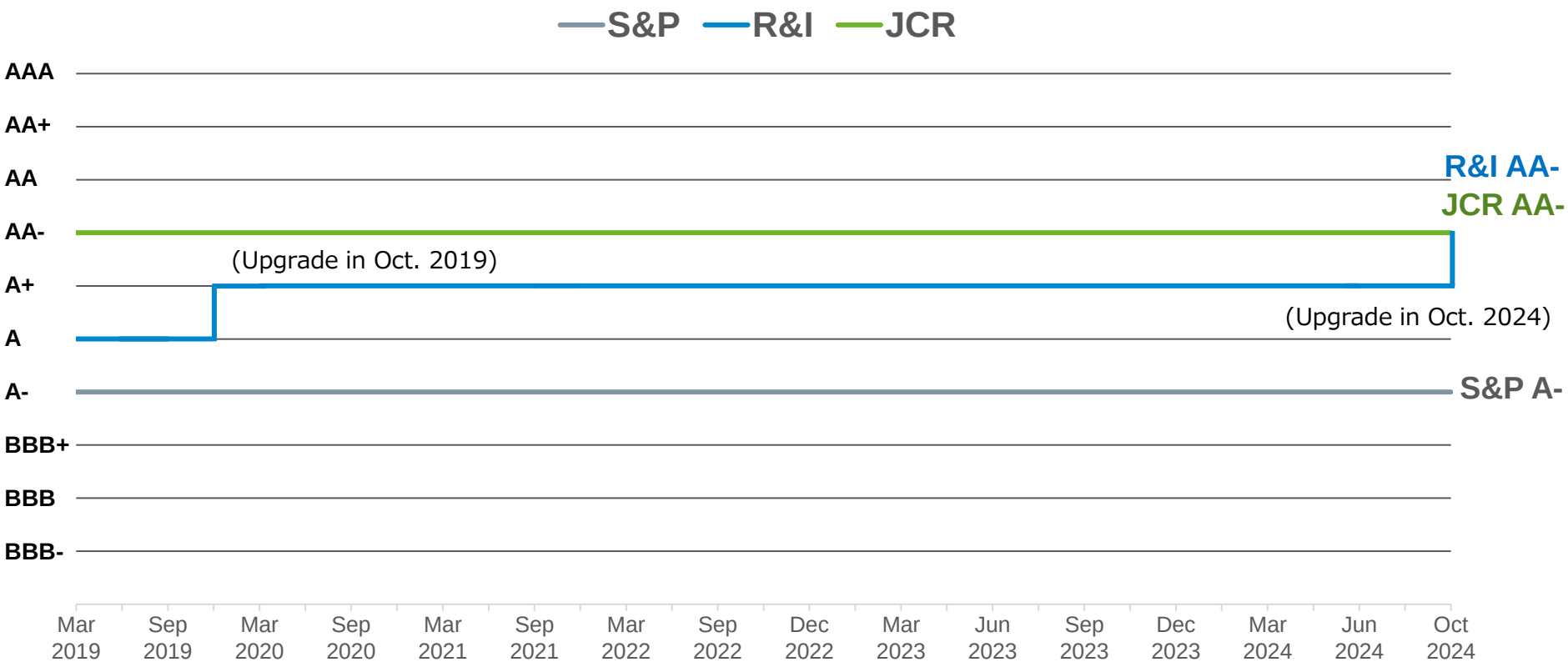
Credit Ratings

[Issuer Credit ratings history]



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Topics

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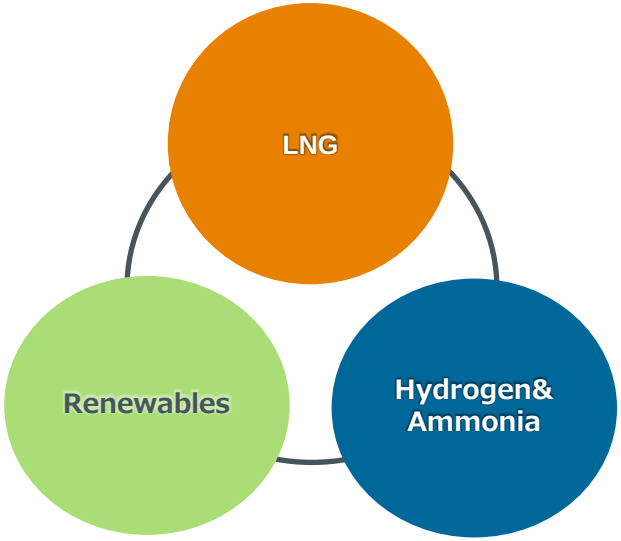
Topic:
JERA Unveils 2035 Growth Strategy

- JERA announced that “JERA Growth Strategy to Realize 2035 Vision, Financial Strategy” and “Financial Target Levels Targeted for by 2035”.
- JERA strategically emphasizes three key business pillars: LNG, renewables, and hydrogen & ammonia. In addition, JERA classifies our organization into three key areas: business development, optimization, and O&M to create synergies by forming and promoting a global group of independent experts while collaborating across borders and functions.

Focus Investment

Strategic Positioning (SP)

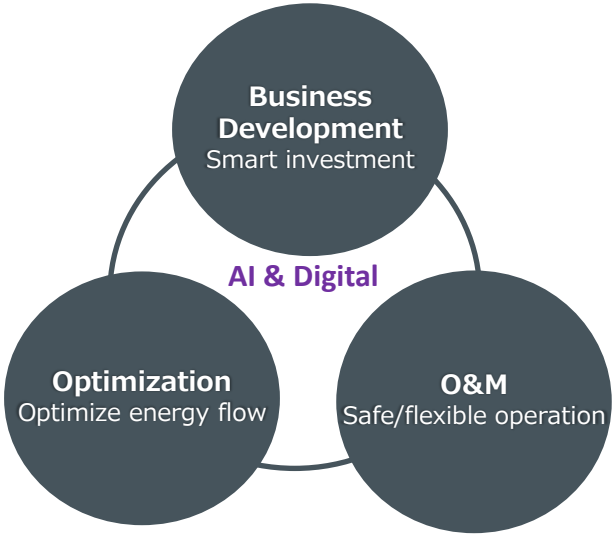
Decide where to invest and where not to invest



Refine Business Functions

Operational Capabilities (OC)

Enhance the way you work on a daily basis



Provide cutting- edge solutions that meet the geographic and economic characteristics of each customer, region and country

References : JERA Unveils 2035 Growth Strategy (jera.co.jp)

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Overview of each segment

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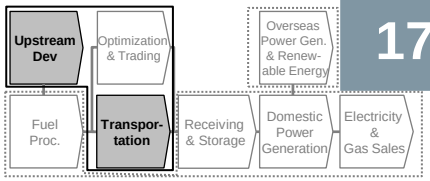
Fuel Business:
Fuel Upstream / Transportation Business



- Demand for LNG has increased in Europe and Asia as low-carbon energy. However, JERA participates in LNG upstream projects by leveraging one of the world's largest LNG transaction volume (FY2022: Approximately 35 million tons*) to achieve stable energy supply. JERA secures stable LNG sources by building portfolio which can diversify procurement risk as well as acquire the information related to procurement and the market trend.
- Additionally, JERA owns fuel carriers that contribute to highly consistent, flexible, and competitive fuel supply.
- In June 2022, a fire incident occurs at the Freeport LNG terminal, shutting down operations at the terminal. In March 2023, regulatory approvals for resumption of production were obtained one by one. And production has resumed at all lines.

*1 JERA Group as a whole

Fuel Upstream Project

Project Name	Country	LNG Production / Liquefaction Capability	Investment Ratio
Darwin LNG Project	Australia	Approx. 3.7 million tons/year	6.132%
Gorgon LNG Project		Approx. 15.6 million tons/year	0.417%
Ichthys LNG Project		Approx. 8.9 million tons/year	0.735%
Wheatstone LNG Project*2		Approx. 8.9 million tons/year	Gas field: 10%, LNG plant: 8%
Barossa gas field Project		LNG production and liquefaction capacity is the same scale as Darwin LNG Project.	12.5%
Scarborough Gas Field Project		Approx. 8.0 million tons/year at maximum (Supply will be planned to start in 2026)	15.1%
Freeport LNG Project (Train1)	United States	Approx. 5.15 million tons/year	25%
Freeport LNG Development, L.P.*3,5		Approx. 15.45 million tons/year*4 for all three lines	21.9%

*2 Ratio of capital contribution through PE Wheatstone, in which JERA invests
*3 Freeport LNG Project Management Company *4 Including 5.15 million tons/year from Train 1
* 5 Ratio of capital contribution through Gulf Coast LNG Holdings LLC, in which JERA invests

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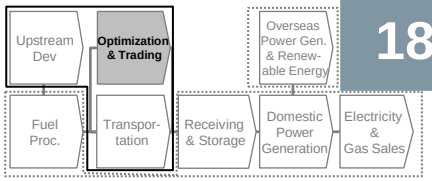
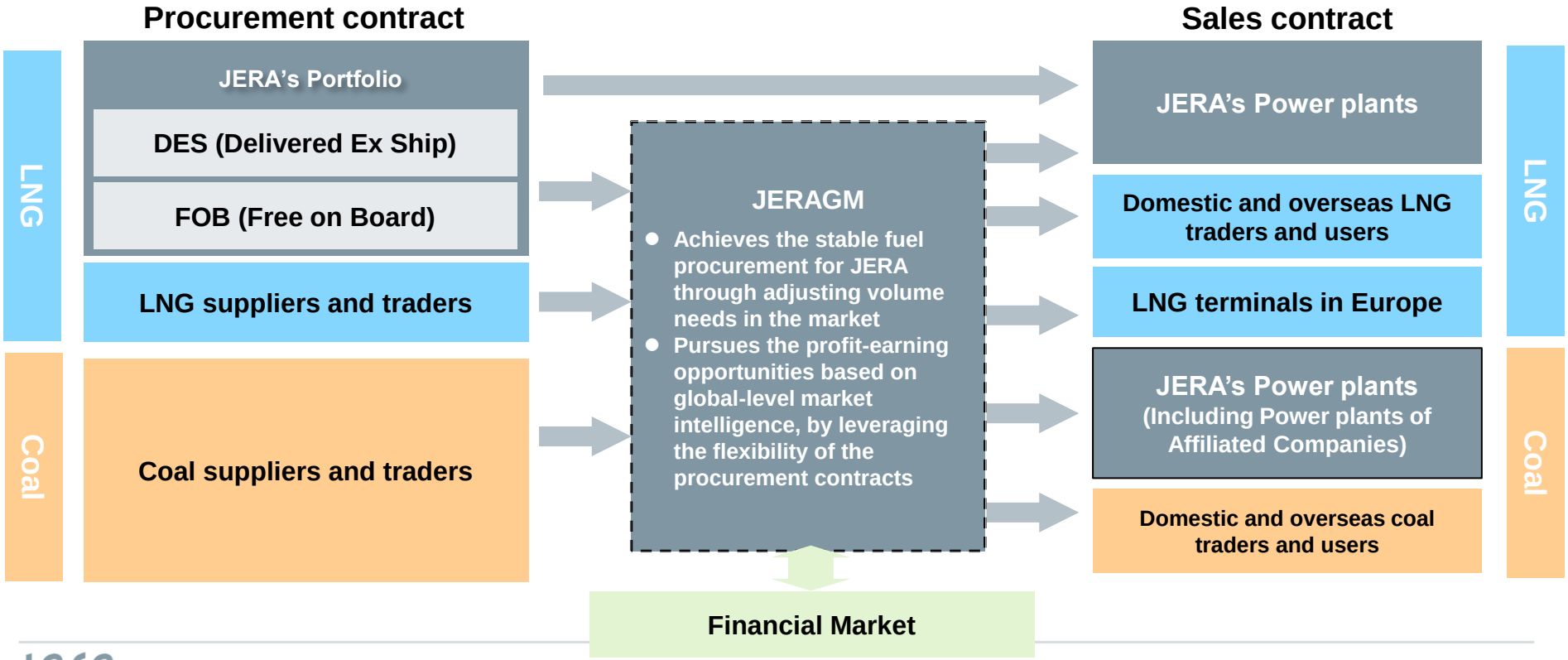
Fuel Business:
Trading Business



- In addition to the Singapore headquarters, JERAGM has offices in the United Kingdom, the United States, and Japan, and holds approximately 300 employees who engage in asset-backed trading.
- Utilizing the global trading network, JERAGM supplies LNG and coal to JERA's domestic power generation business. Leveraging this commercial flow, JERAGM has been able to achieve both supply stability and the expansion of profits by efficiently capturing profit opportunities through transactions with markets and third parties.
- JERAGM trades within the limited volume under the governance of the Board of Directors elected by shareholders.



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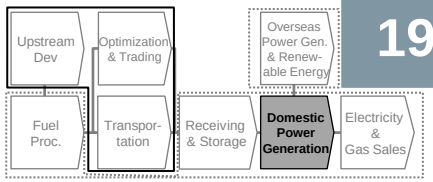
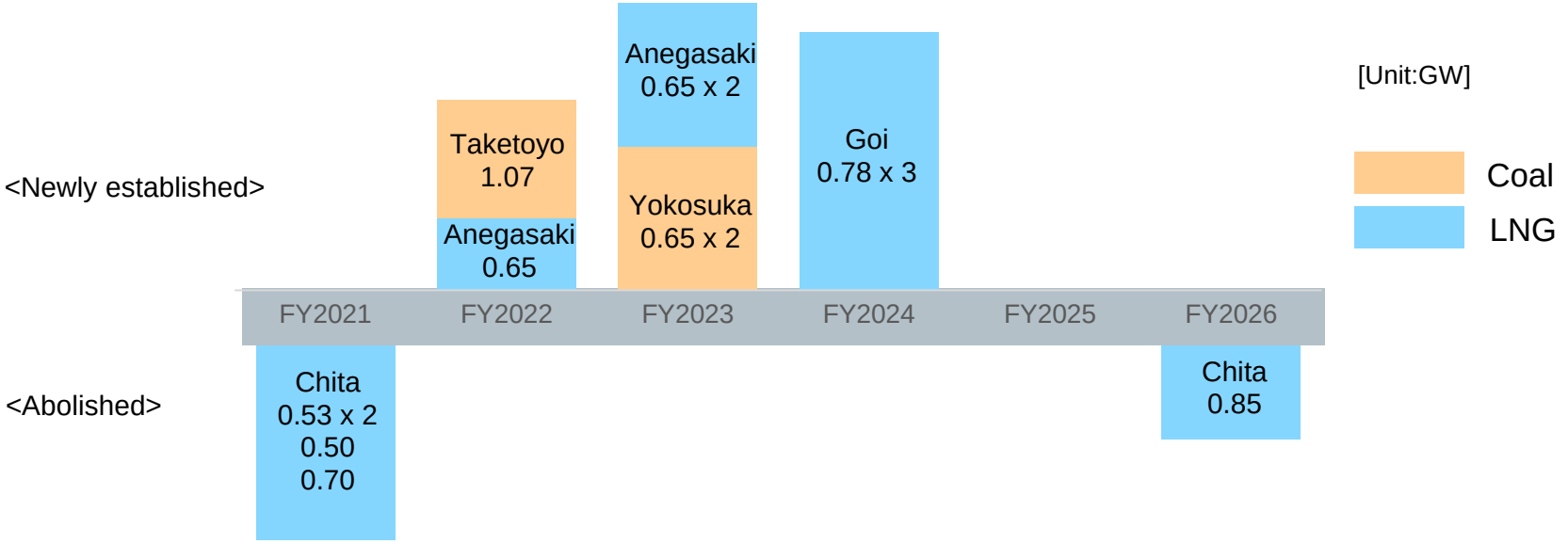
Domestic Thermal Power and Gas Business:
Progress of Replacement of Thermal Power Plants in Japan



- JERA has been replacing with the latest high-efficiency thermal power generation facilities. Following Taketoyo and Anegasaki New Unit 1, Anegasaki New Unit 2 began commercial operation in April, Yokosuka Unit 1 in June, Anegasaki New Unit 3 in August 2023, and Yokosuka Unit 2 in December 2023.
- Construction and commissioning of Goi Unit 1 to 3 are well underway. Unit 1 began commercial operation in August 2024.
- Unit 1 to 4 of Chita were abolished in FY2021. Unit 5 is planned to be abolished in FY2026 and is being considered for replacement with the latest high-efficiency thermal power generation (environmental impact assessment has been conducted).



*As of September 30, 2024

Development Point	Status of Development
Goi	Full-scale construction started in April 2021. Construction progress: 99%

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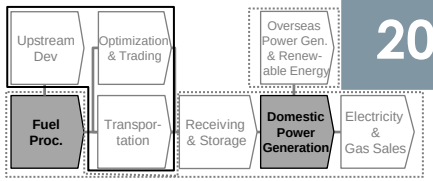
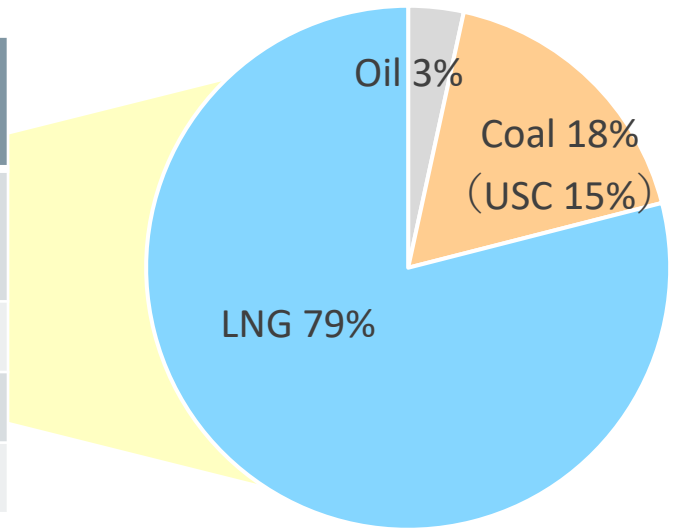
Domestic Thermal Power and Gas Business:
Composition of Power Sources



- 79% of our power source is LNG, which has low CO_2 emissions.
- In coal, ultra super critical power generation system (USC), which emits comparatively small amount of CO_2, accounts for a large proportion. JERA will shut down all inefficient coal power plants by 2030*1.

Composition of Power Sources*2

Fuel	Capacity (Generator output)
Coal (USC)	10.32 GW (8.92 GW)
LNG*3	46.29 GW
Oil	2.00 GW
Total	58.61 GW



*1 Press release on October 13, 2020 "Towards Zero CO_2 Emissions in 2050"
https://www.jera.co.jp/english/information/20201013_539
*2 As of September 30, 2024. Includes capacity under construction.
Excludes capacity of affiliates.
*3 Includes LPG and City Gas.

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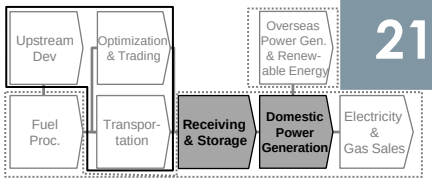
Domestic Thermal Power and Gas Business:
Domestic Thermal Power Plants



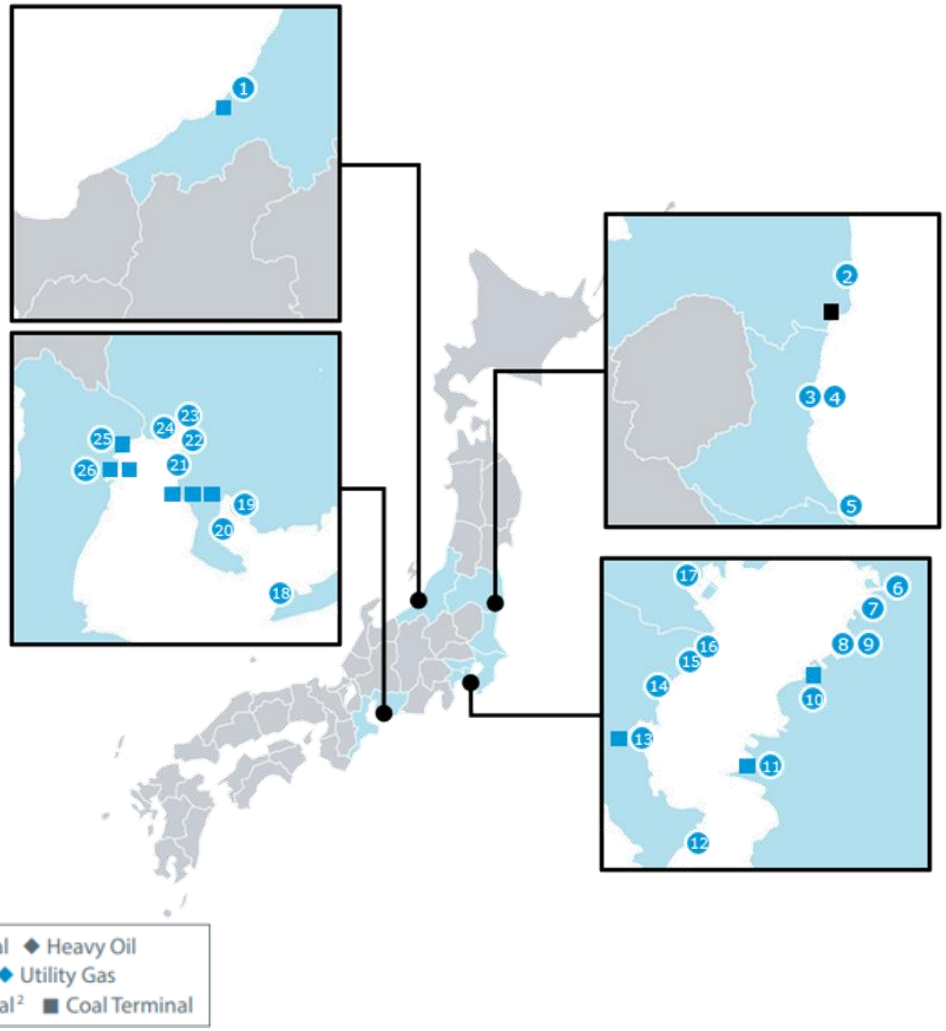
➢ JERA owns nearly 40% of total thermal power generation capacity in Japan.[3]

List of Thermal Power Plants in Japan[1]

(Total output and fuel type listed for each thermal power plant)

As of Sptember 30, 2024

①	Joetsu	2.38 GW	◆
②	Hirono	1.80 GW	◆◆◆
③	Hitachinaka	2.00 GW	◆
④	Hitachinaka Kyodo <HITACHINAKA GENERATION>	0.65 GW	◆
⑤	Kashima	1.26 GW	◆
⑥	Chiba	4.38 GW	◆
⑦	Goi <GOI UNITED GENERATION> *Unit 1 started operation in August 2024	2.34 GW	◆
⑧	Anegasaki	1.20 GW	◆
⑨	Anegasaki <JERA Power ANEGASAKI> *Started operation in August 2023	1.941 GW	◆
⑩	Sodegaura	3.60 GW	◆
⑪	Futtsu	5.16 GW	◆
⑫	Yokosuka <JERA Power YOKOSUKA> *Started operation in December 2023	1.30 GW	◆
⑬	Minami-Yokohama	1.15 GW	◆
⑭	Yokohama	3.016 GW	◆
⑮	Higashi-Ohgishima	2.00 GW	◆
⑯	Kawasaki	3.42 GW	◆
⑰	Shinagawa	1.14 GW	◆
⑱	Atsumi	1.40 GW	◆◆
⑲	Hekinan	4.10 GW	◆
⑳	Taketoyo<JERA Power TAKETOYO> *Started operation in August 2022	1.07 GW	◆
㉑	Chita	1.708 GW	◆
㉒	Chita Daini	1.708 GW	◆
㉓	Shin-Nagoya	3.058 GW	◆
㉔	Nishi-Nagoya	2.376 GW	◆
㉕	Kawagoe	4.802 GW	◆
㉖	Yokkaichi	0.585 GW	◆



1 Power plant's name <Operator's name> 2 Includes jointly operated terminals in the Chita and Yokkaichi areas
3 reference: METI "Electricity Survey Statistics"

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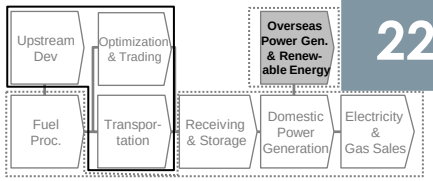
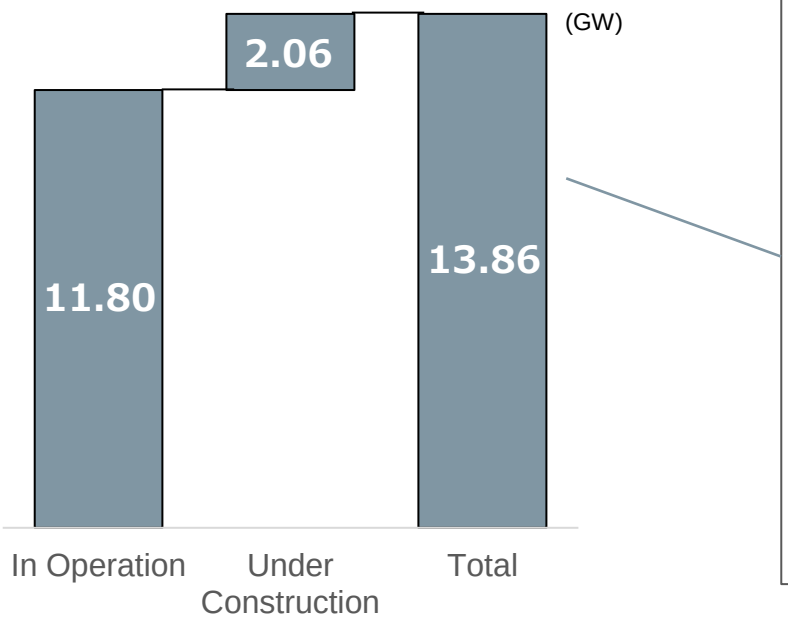
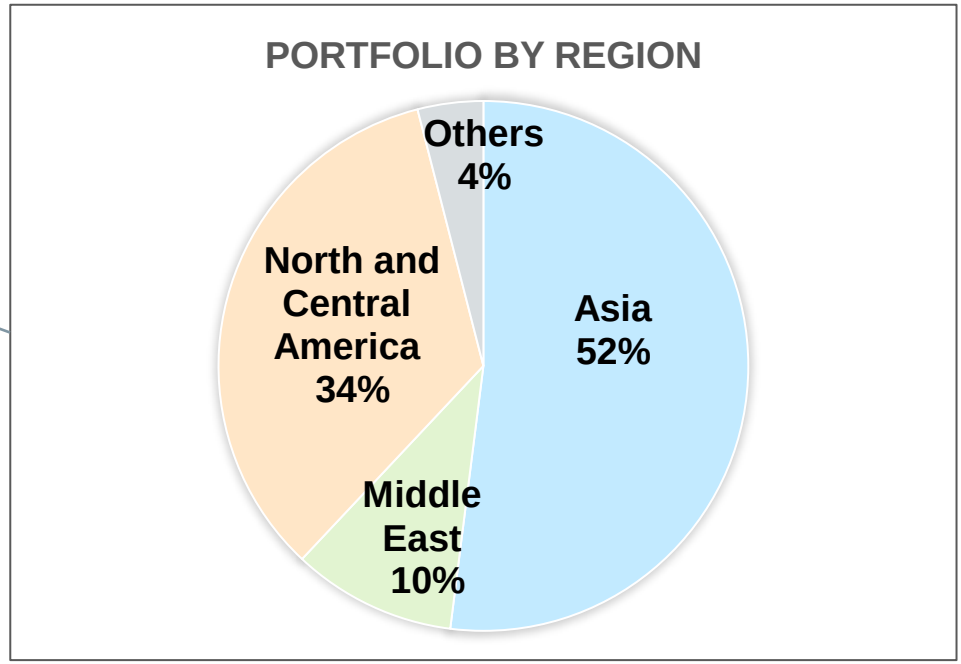
Overseas Power Generation and Renewable Energy Business: Portfolio of Overseas Power Generation and Renewable Energy Business



- JERA is expanding its businesses through the experience gained from projects around the world. Total capacity of power generation in overseas projects is 13.86 GW (including under construction).
- JERA aims to secure funds and expand earnings by replacing its portfolio through the sale and reinvestment of assets to achieve an optimal asset structure in line with changes in the business.

< Power Generation Capacity (As of Spemteber 30, 2024) >





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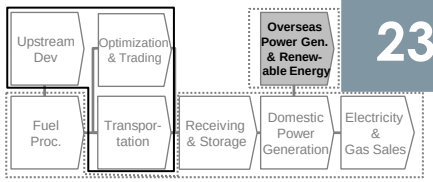
Overseas Power Generation and Renewable Energy Business: List of Overseas Power Generation / Renewable Energy projects (1)



(As of September 30, 2024)

Investment on Platform Companies*

**Companies participating in multiple power generation projects*

Country	Project Name	Investment ratio	Capacity	Fuel type	Notes
Philippines	TeaM Energy IPP	25.0%~50.0%	2,323 MW	Coal	
	Aboitiz Power Corporation	27.57%	4,973 MW	Coal/Oil/ Renewable	Including under construction
Thailand	EGCO Corporation	12.3%	7,041 MW	Coal/Gas/ Renewable	Including under construction
Vietnam	Gia Lai Electricity Joint Stock Company	35.1%	476 MW	Solar/Wind/Hydro	Including under construction
India	ReNew Company	7.38%	15,644 MW	Solar/Wind/Hydro	Including under construction
Bangladesh	Summit Power IPP	22.0%	1,851 MW	Oil/Gas	Including under construction
Japan	Green Power Investment	5.62%	N/A	Offshore Wind	*1
United Kingdom	Zenobe Battery Storage	6.31%	731 MW	-	Including under construction
Belgium	Parkwind	100.0%	535 MW	Offshore Wind	

**1 The capacity only includes the offshore wind projects that JERA has agreed with other shareholders to utilize its management assets*

Power Generation / Renewable Energy Projects(1/2)

Japan	Solar	100.0%	71 MW	Solar	Including under construction
	Ishikari Bay New Port Offshore Wind Farm	100.0%*2	112 MW	Offshore Wind	
Taiwan	Chang Bin/Fong Der/Star Buck Gas Thermal IPP	19.5%~22.7%	3,170 MW	Gas	Including under construction
	Formosa 1 Offshore Wind IPP	32.5%	128 MW	Offshore Wind	
	Formosa 2 Offshore Wind IPP	49.0%	376 MW	Offshore Wind	
Vietnam	Phu My Gas Thermal IPP	15.6%	715 MW	Gas	
Indonesia	Cirebon2 Coal Thermal IPP	10.0%	1,000 MW	Coal	

**2 This is actual investment ratio added direct investment by JERA and indirect investment through GPI.*

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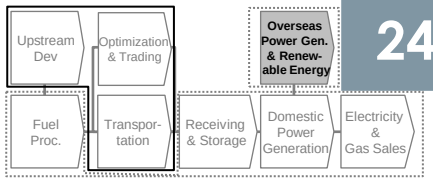
Overseas Power Generation and Renewable Energy Business: List of Overseas Power Generation / Renewable Energy projects (2)



(As of September 30, 2024)

Power Generation / Renewable Energy Projects(2/2)

Country	Project Name	Investment ratio	Capacity	Fuel type	Notes
Thailand	Ratchaburi Gas Power Thermal IPP	15.0%	1,400 MW	Gas	
	Solar Power IPP	49.0%	31 MW	Solar	
	Wind Power IPP	5.0%	180 MW	Onshore Wind	
Bangladesh	Meghnaghat Gas Thermal IPP	49.0%	718 MW	Gas	Under construction
UAE	Umm Al Nar Gas Thermal IWPP	20.0%	1,550 MW	Gas	
Qatar	Ras Laffan B Gas Thermal IWPP	5.0%	1,025 MW	Gas	
	Ras Laffan C Gas Thermal IWPP	5.0%	2,730 MW	Gas	
	Mesaieed Gas Thermal IPP	10.0%	2,007 MW	Gas	
	Umm Al Houl Gas Thermal IWPP	10.0%	2,520 MW	Gas	
Oman	Sur Gas Thermal IPP	19.5%	2,000 MW	Gas	
Mexico	Valladolid Gas Thermal IPP	50.0%	525 MW	Gas	
United States	Tenaska Gas Thermal IPP	11.1%~17.5%	2,950 MW	Gas	
	Carroll County Gas Thermal IPP	20.0%	702 MW	Gas	
	Cricket Valley Gas Thermal IPP	38.0%	1,100 MW	Gas	
	Linden Gas Thermal IPP	50.0%	972 MW	Gas	
	Compass Gas Thermal IPP	50.0%	1,123 MW	Gas	
	Brady Thermal IPP	100.0%	1,633 MW	Oil/Gas	
	El Sauz Onshore Wind IPP	100.0%	302 MW	Onshore Wind	Under construction
	Happy/Oxbow Solar IPP	100.0%	395 MW	Solar	
United Kingdom	Gunfleet Sands Offshore Wind IPP	25.0%	173 MW	Offshore Wind	

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Progress of
JERA Zero CO_2 Emissions 2050

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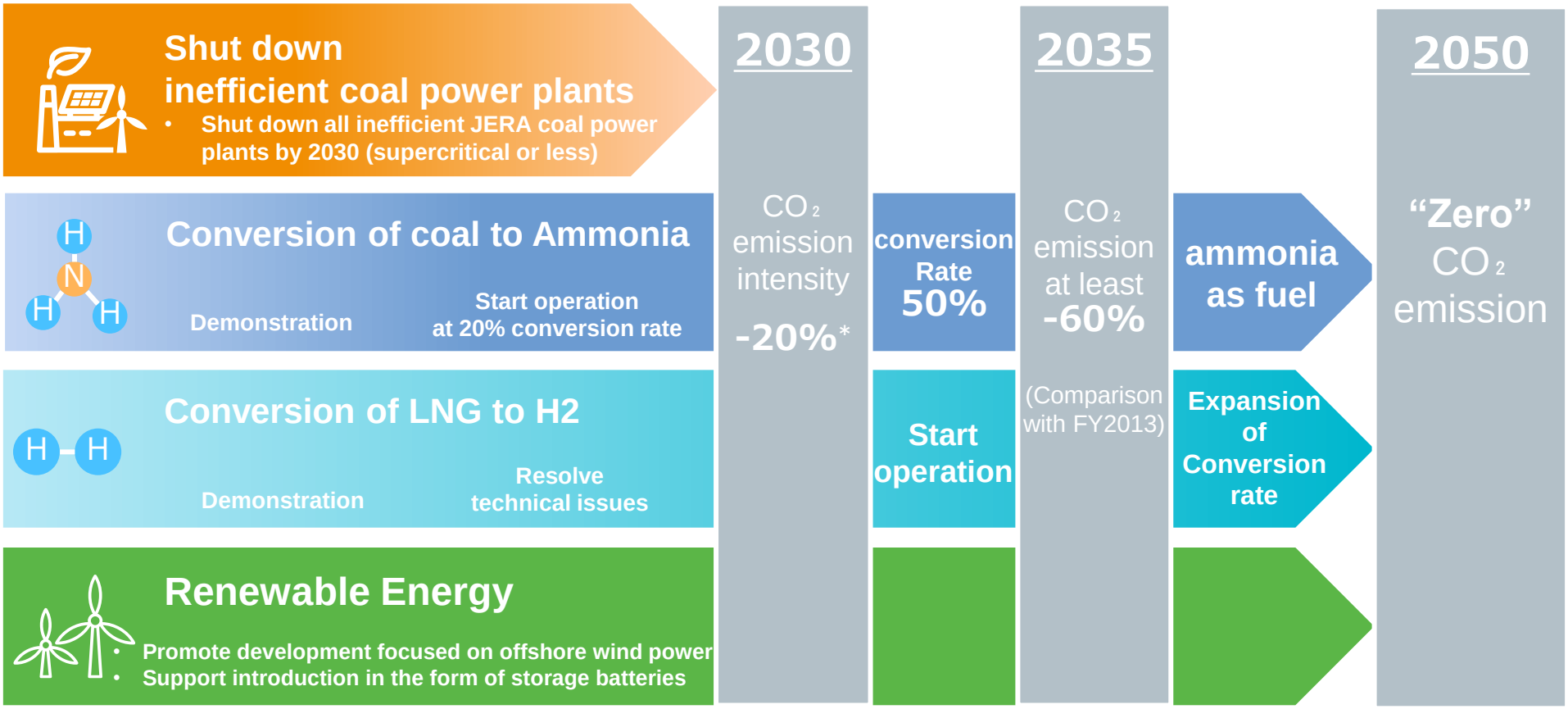
JERA Zero CO2 Emissions 2050: Roadmap for its Business in Japan

➢ JERA established "JERA Zero CO_2 Emissions 2050 Roadmap for its Business in Japan", including four initiatives.



*Reduce carbon emission intensity of thermal power plants by 20% based on the long-term energy supply-demand outlook for FY2030 as set by the government

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JERA Zero CO2 Emissions 2050:
Efforts to Achieve Zero CO2 Emissions in JERA's Value Chain

- JERA is participating in business throughout the value chains, from fuel upstream development, transportation, and storage and to the power generation and electricity sales. JERA is working with many countries and companies around the world to achieve zero emissions at each stage.

Fuel upstream development Transportation and storage

Fuel upstream development

Fuel transportation

Fuel receiving and storage

- Building ammonia and hydrogen supply chain

Power generation and sales

Power generation

Electricity sales

- Demonstration project for ammonia conversion and conversion rate improvement technology
- Demonstration project for hydrogen utilization
- Selling carbon-free electricity

Renewable energy development

Renewables

- Development of wind and solar power generation and participation in these projects
- Participation in battery storage business

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JERA Zero CO2 Emissions 2050:
Efforts towards Zero CO2 Emissions (Ammonia and Hydrogen Supply Chain)①

Field	Business Partners	Contents	Release Date
Upstream Development /Production	ADNOC (UAE)	Consideration of cooperation in the fields of clean hydrogen and ammonia	2023/7
	PIF (Saudi Arabia)	Consideration of opportunities for the development including green hydrogen production	2023/7
	TAQA (UAE)	Consideration of project development in the area of decarbonization, including green hydrogen and ammonia production	2023/2
	CF Industries (United States)	Joint Development Agreement for Low Carbon Ammonia Project	2024/4
	Yara (Norway)	Consideration of project development for blue ammonia production and sales & purchase of clean ammonia	2023/1
	Chevron (United States)	Consideration of collaboration on multiple lower carbon opportunities in Asia Pacific region (Australia) and the United States	2022/11
	Exxon Mobil (United States)	The Joint Study to Develop Low Carbon Hydrogen and Ammonia Production Project	2024/3
	ReNew (India)	Agreement to Jointly Develop a Green Ammonia Production Project	2024/4
	Lotte Fine Chemical (Korea)	Joint Collaboration Agreement to Realize Low Carbon Fuel Value Chains	2024/8
	POSCO International (Korea)	Joint Collaboration Agreement to Realize Low Carbon Fuel Value Chains	2024/9
Transportation	Nippon Yusen / Mitsui O.S.K. Lines	Consideration of transporting fuel ammonia for the Hekinan Thermal Power Plant	2022/11
R&D (NEDO's Project)	NIPPON SHOKUBAI Chiyoda Corporation*	Development of large-scale ammonia cracking catalyst and technology	2023/6
	ENEOS*	Construction of hydrogen quality standard system for industrial utilization	2023/6
	Toyo Engineering Corporation (Japan) *	Survey of Hydrogen and Ammonia Demand, and Demonstration Research to Achieve Stable Operation of Ammonia Cracking Equipment, in Thailand	2024/6
	DENSO (Japan)	Jointly Develop High-Efficiency Hydrogen Generation Technology that Combines SOEC with Waste Heat Utilization and Joint Demonstration Testing at a JERA Thermal Power Station	2024/8

* Implemented under a project subsidized by the New Energy and Industrial Development Organization (NEDO)

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JERA Zero CO2 Emissions 2050:
Efforts towards Zero CO2 Emissions (Ammonia and Hydrogen Supply Chain)②

Field		Business Partners	Contents	Release Date
Power Supply / Utilization	Japan	Kyushu Electric Power	signed a MOU concerning comprehensive discussions on collaboration aimed at achieving decarbonization and a stable supply of energy supply	2023/10
		Kyushu Electric Power Chugoku Electric Power Shikoku Electric Power Tohoku Electric Power Hokuriku Electric Power Hokkaido Electric Power Okinawa Electric Power	Consideration of cooperation in the adoption of hydrogen and ammonia as fuel for power generation	2022/11 ~ 2023/12
		Mitsui	Signed an Ammonia Sales and Purchase Agreement for its use in the demonstration project at the Hekinan Thermal Power Station	2023/6
		Graduate School in University of Tokyo	Basic Agreement Concerning the Mainstreaming of Carbon-Free Power Combining Digital Technology and Energy	2024/3
		Yamanashi prefecture	Conclusion of a Basic Agreement on Building the Hydrogen Energy Society of the Future: Building a Regional Hydrogen Value Chain	2023/11
		NYK Line, Resonac	The World's First Truck-to-Ship Bunkering of Fuel Ammonia	2024/8
		JERA	JERA Cross Launched to Accelerate Corporate Green Transformation (GX)	2024/5
	Europe	Uniper (Germany)	Signed a Heads of Agreement for the sale of low carbon hydrogen/ammonia produced in the US	2023/9
		EnBW / VNG (Germany)	Consideration of the development of ammonia cracking technology for hydrogen production	2023/6
	Asia	EVN (Vietnam)	Signed a MOU that commits the collaboration to establish a decarbonization roadmap for EVN	2023/10
		PPT (Thailand)	Consideration of collaboration on initiatives for expanding the supply chain and usage of hydrogen and ammonia towards decarbonization in Thailand	2023/5
		Aboitiz Power (Philippines)	Consideration of cooperation in studies to decarbonize business and conversion using ammonia at a coal-fired power plant	2023/2
		EGCO (Thailand)	Consideration of cooperation in conversion using ammonia towards decarbonization	2023/1
		IHI Asia Pacific (Malaysia)	Consideration of collaboration on the expansion of ammonia usage in Malaysia	2022/10
		PT Pertamina (Indonesia)	Joint collaboration in building infrastructure LNG and hydrogen/ammonia and so on	2023/12
		PLN (Indonesia)	Master Plan for Energy Transition Management Project in Indonesia	2024/2

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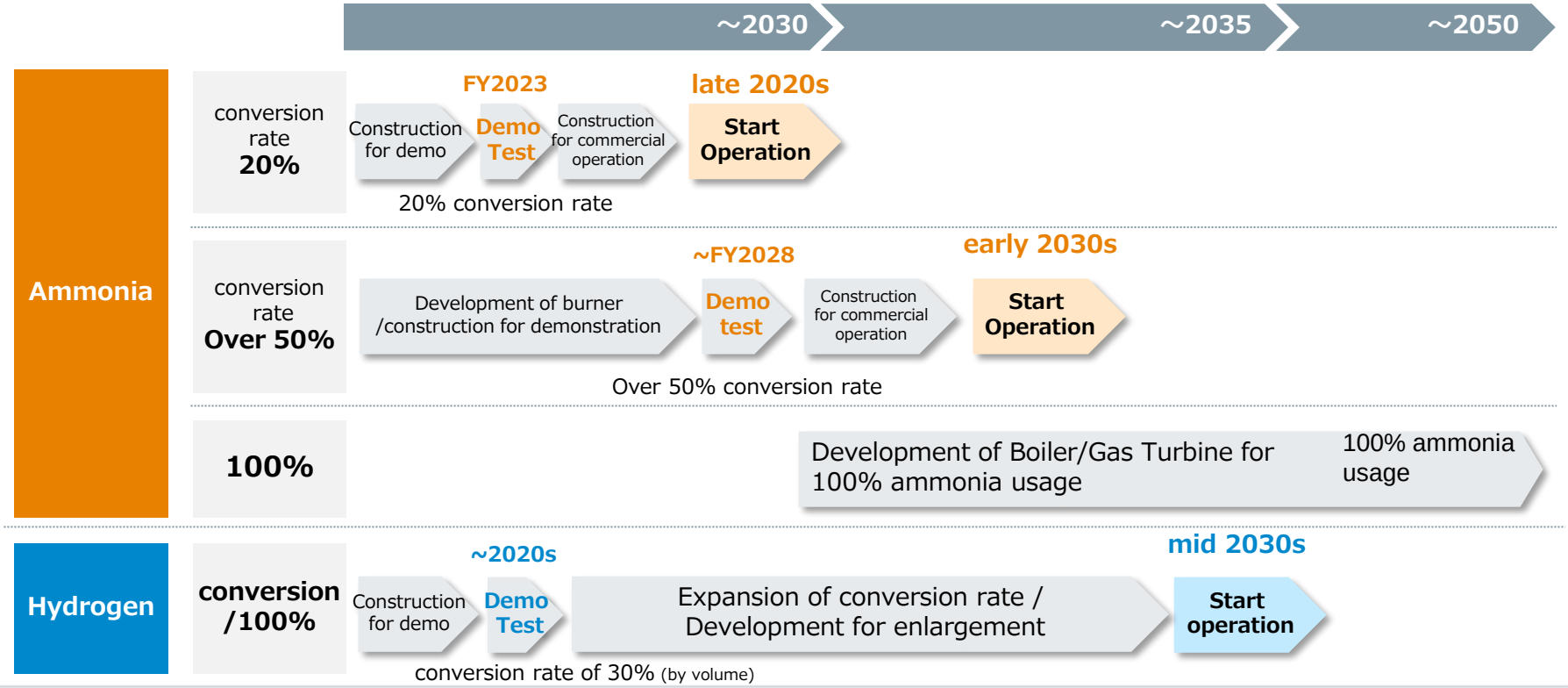
JERA Zero CO2 Emissions 2050:

JERA's decarbonization technologies development timeline

- The demonstration test of ammonia 20% conversion rate (by calorie) concluded in June 2024 in Hekinan power plant Unit 4 and planning to start commercial operation in the 2020s.
- For over 50% conversion rate, demonstration tests using the Green Innovation Fund Program will be conducted by FY 2028. Based on the results, development for 100% ammonia usage will be promoted.
- Demonstration test of hydrogen 30% conversion rate (by volume) using JERA's gas turbine CC unit will be conducted by FY2020s.



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JERA Zero CO2 Emissions 2050:
Efforts towards Zero CO2 Emission (Power Generation)

Initiatives for Ammonia Conversion

Project	Development of Technologies for Carbon Recycling and Next-Generation Thermal Power Generation / Research, Development, and Demonstration of Technologies for Ammonia Co-Firing Thermal Power Generation *Implemented as a granted project by NEDO	Green Innovation Fund Program / Establishment of Fuel Ammonia Supply Chains project / Demonstration project to develop technology to increase the ammonia co-firing rate at coal-fired boilers
Overview	• At Hekinan Thermal Power Station Unit 4 (power output: 1 million kW), JERA started electricity generation of **20% ammonia conversion.** Hekinan Thermal Power Station	• JERA aims to **increase the ammonia conversion rate to 50% or more**. • JERA will plan to develop a burner capable of 50% or more ammonia conversion, and to start 50% or more ammonia conversion in actual equipment by FY2028. • JERA will plan to develop an ammonia-fired burner suitable for coal boilers and verify that two units of different boiler types can **convert to ammonia more than 50%** by FY2028.

Initiatives for Hydrogen Conversion

- Started joint development of high-efficiency hydrogen generation technology utilizing waste heat using SOEC* developed by Denso. Joint demonstration tests are scheduled to start in FY 2025 at a thermal power plant in our company.

* SOEC(Solid Oxide Electrolysis Cell):SOECs operate at high temperatures using a ceramic membrane as an electrolyte to electrolyze water vapor and produce hydrogen.

- Received notice of acceptance of “Technology development project aimed at building a competitive hydrogen supply chain”, JERA is developing a catalyst to extract hydrogen from ammonia and evaluating the catalyst and process from the perspective of a power generation company.

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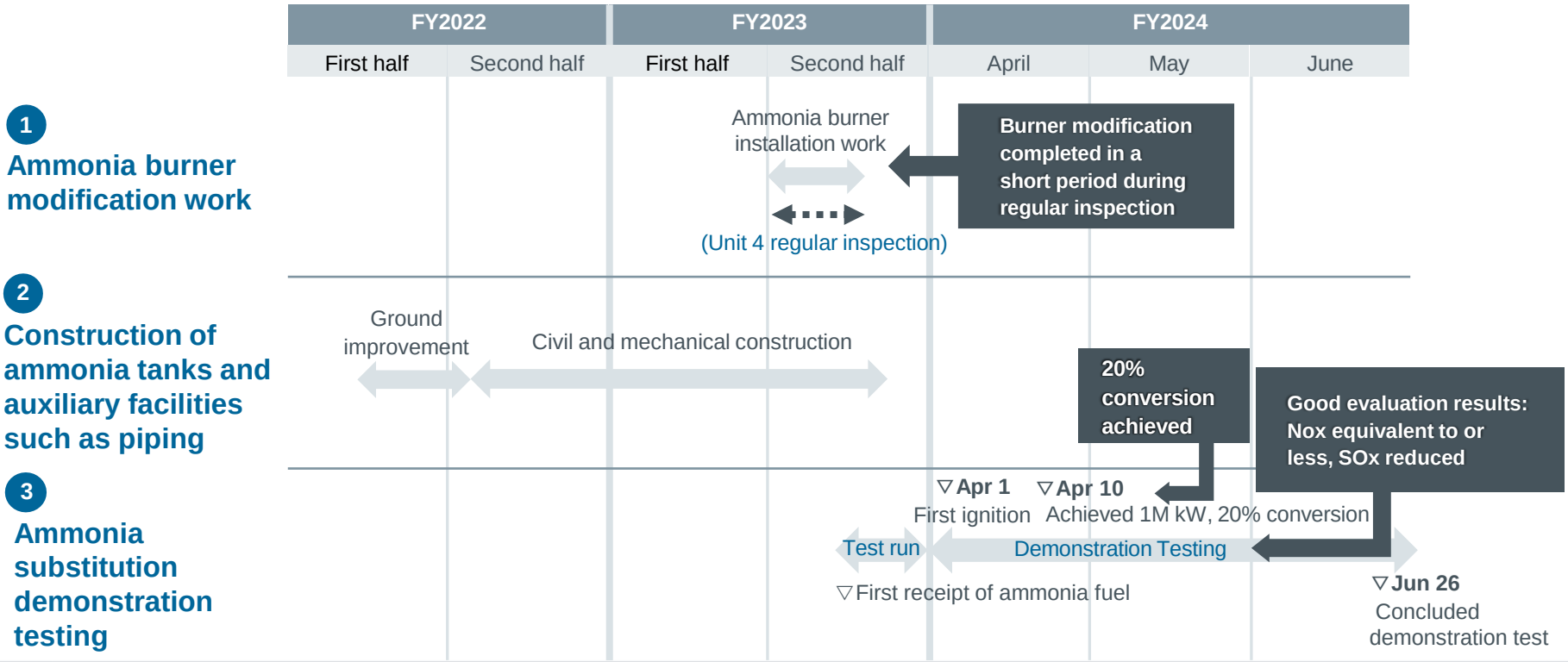
JERA Zero CO2 Emissions 2050:
Conclusion of 20% Fuel Ammonia Substitution Demonstration Testing

- The world's first demonstration testing of 20% ammonia substitution at a large-scale commercial coal-fired thermal power plant in Hekinan thermal power station unit 4 concluded in June 2024.
- Results were positive, confirming that the level of nitrogen oxides (NOx) generated was no higher than before fuel ammonia substitution (than when firing coal alone), a 20% reduction in sulfur oxides (SOx), and that generation of N2O was below the threshold for detection.

Schedule for Construction of Demonstration Facility and Demonstration Test



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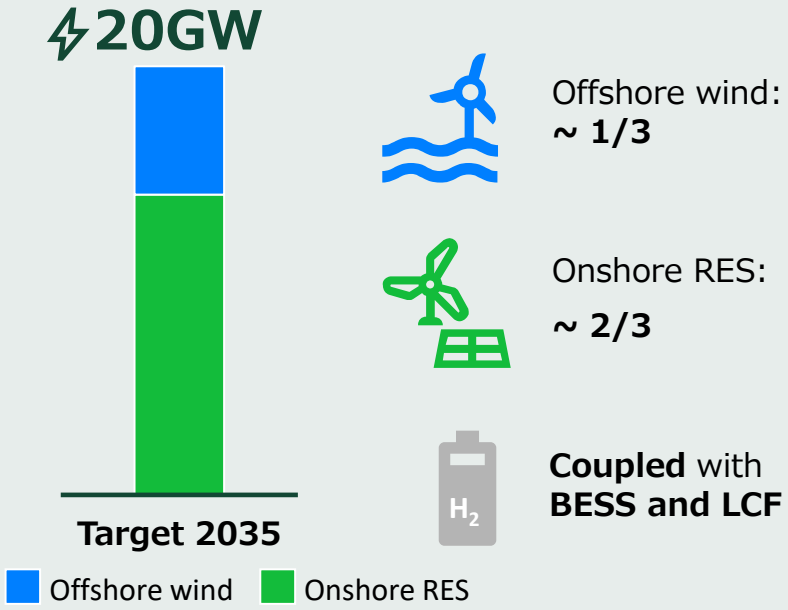
JERA Zero CO2 Emissions 2050:
Establishment of JERA Nex

- The UK-based subsidiary specialized in renewable energy, “JERA Green” changed its name to “JERA Nex” to introduce and develop renewable energy business and start its operation in April 2024.
- A range of our renewable energy assets will be collected to JERA Nex, which will construct a platform to develop our renewable energy business swiftly.
- The new target to develop renewable capacity: 20GW in FY2035

Summary	
Name	JERA Nex Limited
CEO	Nathalie Oosterlinck Head of Global Renewables at JERA
Investor	JERA: 100%
Registration date	March 26, 2024
Location	UK, London
Business	Investment and development for a range of renewable energy assets, including offshore and onshore wind, solar and battery storage in the world. Operation of renewable energy assets by taking advantage of O&M.

Proposed JERA Nex 2035 global net installed capacity ambition*1



*1 Assumed average net share of 50%. Analysis based on benchmarking average capacity additions targets and market share of global competitors

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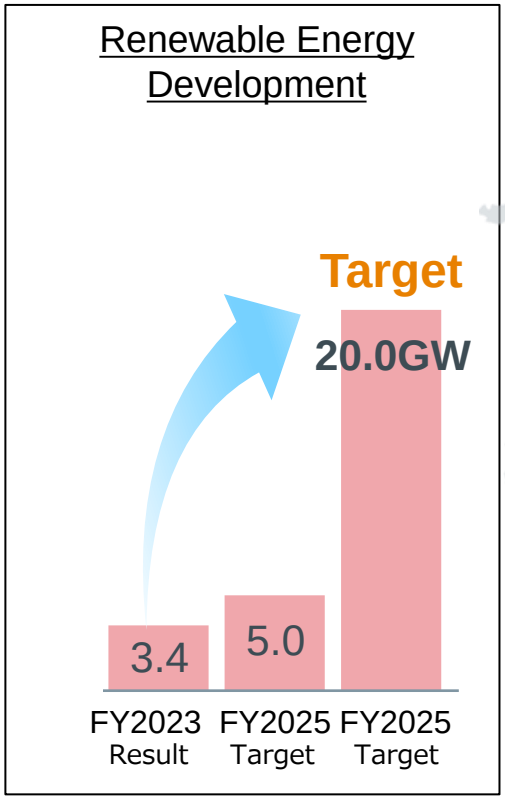
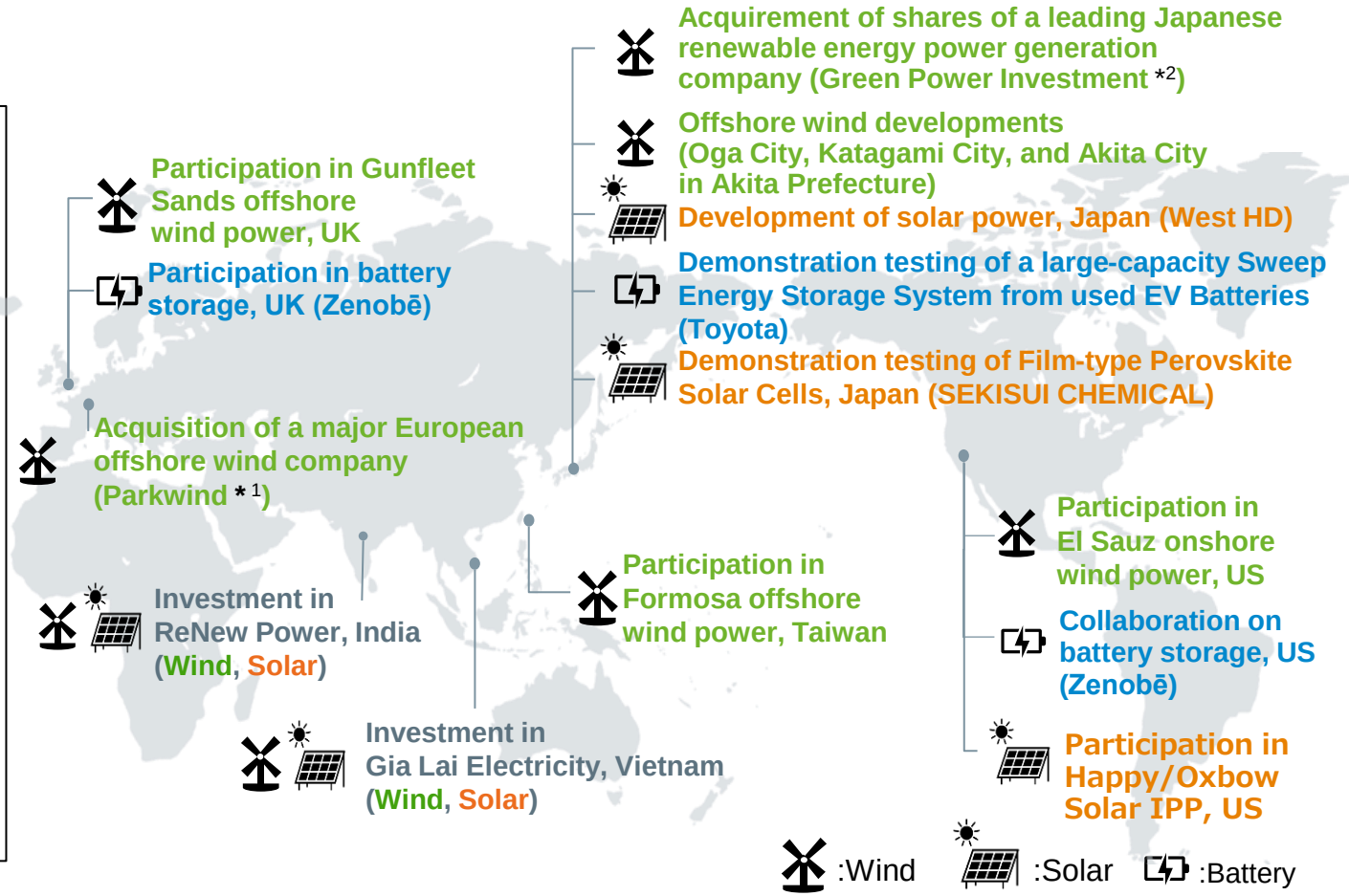
JERA Zero CO2 Emissions 2050:
Efforts towards Zero CO2 Emission(Renewable Energy Development)

➢ JERA has set a target of 20GW renewable energy development by FY2035, and is widely promoting wind power, solar power, battery storage, etc.





*1 Parkwind's equity generation capacity is 0.54GW.
*2 JERA's equity generation capacity is approximately 0.11GW.

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JERA Zero CO2 Emissions 2050:
Actions for Domestic Offshore Wind Power Generation

- JERA selected as the business operator for an offshore wind power project off Oga city, Katagami city, and Akita city in Akita prefecture on December 13, 2023.

Oga, Katagami, and Akita Offshore Green Energy Consortium	
Interconnection Capacity	315MW
Number of Units	21 units
Turbine Model	Vestas V236-15MW
Planned Start of Commercial Operation	June 2028

<Map of Business Areas>

- JERA acquired shares of Green Power Investment Corporation on August 3, 2023. On January 1, 2024, Ishikari Bay New Port Offshore Wind Farm held by JERA and GPI began in its operation.

Ishikari Bay New Port Offshore Wind Farm	
Interconnection Capacity	112 MW
Number of Units	14 units
Turbine Model	Siemens Gamesa 8MW
Start of Commercial Operation	1st January 2024

<Turbine Generator Installation>

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JERA Zero CO2 Emissions 2050:
JERA Cross business launch

- JERA has established JERA Cross with the aim of combining its energy, digital, and business transformation capabilities to accelerate corporate “green transformation” (GX) in June.
- Integrated support for companies from designing their future vision and strategy for the GX, to the development and supply of renewable energy and other energy sources needed to decarbonize electricity will be provided for the realization of decarbonized society.
- JERA Cross will also provide a stable supply of “24/7 carbon free electric power” that emits no CO2 twenty-four hours a day, 365 days a year*, contribute to solving client issues, transforming client businesses, and reducing CO2 emissions.

Overview of JERA Cross	
Company name	JERA Cross Co., Inc.
Investor	JERA Co., Inc. : 100%
Location	Nihonbashi Takashimaya Mitsui Building 25F, 2-5-1 Nihonbashi, Chuo-ku, Tokyo
Business Description	Provisions of services that support GX projects and solutions for electricity decarbonation
Website	https://www.jera-cross.com/en/

*In accordance with the Ministry of Economy, Trade and Industry's "Guidelines for Retail Sales of Electricity," this means providing 100% of the electricity supply from CO2 zero-emission sources, including the environmental value derived from the use of non-fossil certificates. This does not mean that no CO2 is emitted during the entire life cycle of the fuel, including its production, transportation, etc.

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