SECTION Business Initiatives

CONTENTS

30 Our Value Chain and Reporting Segments

Medium and Long-Term Strategy

About JERA

Table of Contents /

Editorial Policy

The Infrastructure Behind Our Strategies $\left[\leftarrow \right] \rightarrow$

Data

- **31** Business Initiatives Fuel Business
- 34 Overseas Power Generation and Renewable Energy Business
- 37 Domestic Thermal Power Generation and Gas Business
- 40 Initiatives at Thermal Power Plants in Japan
- 41 Information Technology (IT) / Digital Transformation (DX)
- 42 Digital Innovation (DI)

Our Value Chain and Reporting Segments

Owning the Entire Fuel and Thermal Power Value Chain

We are involved in the entire value chain of fuel and thermal power, including upstream operations, transportation, storage (fuel terminal operations), power generation, and wholesale.

Of particular note here is LNG. We handle approximately 36 million tons of LNG per year—one of the world's largest volumes—and as one of the top power providers in Japan, we generate approximately 30% of the country's electricity. Most of our power plants are located in the Kanto and Chubu regions. Japan is surrounded by ocean and lacks international transmission lines to connect it with neighboring countries, so our power plants help the country maintain a stable supply of electric power.

Our Three Reporting Segments

JERA's reporting segments are comprised of three business initiatives: "Fuel Business,""Overseas Power Generation and Renewable Energy Business," and "Domestic Thermal Power Generation and Gas Business."

Our fuel business leverages the market to optimize the production and transport of LNG—a primary fuel for thermal power generation as well as JERA Group assets, including LNG upstream and fuel procurement contracts for our domestic thermal power generation and gas business.

Our overseas power generation and renewable energy business consists of power generation operations outside Japan, as well as renewable energy development projects both in Japan and overseas.

Finally, our domestic thermal power generation and gas business manages essential fuel procurement contracts, receives fuel based on those contracts, and performs operation and maintenance (O&M) and engineering functions, offering high-guality energy services while fulfilling our primary responsibility of ensuring a stable energy supply for the domestic market.



About JERA

Medium and Long-Term

Stratem

Table of Contents /

Editorial Policy

Featured

Revolutionizing How Electricity is Sold: JERA Cross Goes Full-Scale in June 2024

We launched JERA Cross at full scale in June 2024 to help businesses drive their decarbonization efforts and to do our part in the rollout of 24/7 carbon-free electricity. We seek to provide one-stop decarbonization solutions—from management to execution—by utilizing our expertise in the energy field while leveraging digital technology to manage supply and demand and tap into sales functions of renewables and other energy sources. Going forward, JERA will create a green customer market and capture the demand driven by the shift toward energy prosumption, thereby enhancing the business potential of LNG, renewable energy, and hydrogen/ammonia, the three strategic positioning businesses (SPs) outlined in the JERA Growth Strategy.

Now more than ever, we believe it is necessary to recognize again that the value of electricity varies depending on its energy source. Electricity's value is no longer limited to conventional measures such as kW (capacity to generate electricity) or kWh (electricity generated). Now we must also factor in environmental value, such as low CO₂ emissions, and the value of flexibility in accommodating shortterm supply and demand fluctuations stemming from daily shifts in weather conditions, as well as long-term fluctuations associated with seasonal changes. We are determined to rise to this challenge by utilizing digital technology to segment the value of electricity and thereby arrive at an optimal combination of power sources to achieve decarbonization, a stable supply, and economic efficiency.



The Infrastructure Behind

Our Strategies

Manufacturing Capital

Upstream Investments: 6 projects

LNG Cargo Fleet: 23 vessels

Data $\left| \left[\left\{ \right\} \right] \right|$

Business Overview

Fuel Upstream and Transportation

We handle approximately 36 million tons of LNG annually and actively participate in LNG upstream ventures in Australia and the United States. By securing competitive LNG and gaining access to valuable intelligence from major production projects, we contribute to the stable supply. In addition, in our LNG transportation business, we achieve flexible and competitive fuel transportation through the optimal configuration and efficient operation of our fleet.



Fuel Trading

Centered on JERA Global Markets (JERA GM), headquartered in Singapore, we operate with a team of about 300 people, trading in the global LNG, coal, and shipping markets. A hallmark of our fuel trading is "asset-backed trading." Leveraging one of the world's largest fuel procurement scales, we integrate third-party transactions with fuel flows for our shareholders, optimally managing the volume and destinations of each contract and flexibly responding to market trends. We also harness financial methods to capitalize on the benefits from these physical transactions, ensuring revenue opportunities at a relatively low risk.

Distinguishing Features

Strengths

- The world's largest competitive and flexible LNG procurement portfolio
- Extensive market intelligence
- Flexibility in LNG terminal and power plant operations and fuel receiving

Issues

- Increased interest-bearing liabilities due to the surge in resource prices
- Tightening of policies and regulations in upstream business investment destination countries

Opportunities

- Increased market volatility leading to optimization opportunities
- Increased transaction opportunities with new customers
- Acquisition of premium upstream development project information through leveraging overseas subsidiaries and the world's largest buyer network

Risks

- Negative impact of geopolitical risks on fuel procurement
- Reduced optimization opportunities due to domestic power supply and demand constraints
- Credit risk
- Profit and loss fluctuations in upstream development projects due to resource price volatility

Utilizing Business Capital

Leveraging one of the world's largest procurement scales, we have formed a competitive fuel portfolio that includes participation in upstream ventures, and we pursue optimal operations through the use of our own transportation fleet and "asset-backed trading." These initiatives are made possible by our talented, diverse professionals with experience across our fuel business units, including our overseas subsidiaries.



Wheatstone LNG Project, Australia Source: Chevron Australia

Social Capital

- A global trading network throughout the value chain
- A presence in the market based on one of the world's largest LNG transaction volumes

Key Business Capital

- Human Capital
 - Diverse talent from in and outside of Japan

The Infrastructure Behind

Our Strategies

- Intellectual Capital
 - Extensive market insights
 - Trading expertise



Value Provided

• Stability and flexibility in fuel supply

Issue Awareness in the Fuel Business

There is a growing risk that political sentiment in Australia and North America, where we participate in upstream LNG fuel ventures, could cause a tightening of regulations or the implementation of climate change policies that would constrict our business or incur additional costs. We will take all measures necessary to ensure compliance while working with the Japanese government and local partners to stabilize the business environment so that project operations can continue.

Positioning within the Value Chain

We are working to optimize the entire value chain from fuel procurement to electricity sales to minimize the impact of increasing fluctuations in electricity demand brought on by uncertainties that include the expansion of renewable energy fostered by changes in policies and laws. Within the fuel business, we contribute to securing a stable supply by participating in upstream fuel projects to secure competitively priced LNG, by operating an optimized fleet of LNG cargo fleet to enable flexibility in LNG transportation, and by utilizing global fuel trading.

Key Business Indicators and Revenue Generation

Our LNG transaction volume for FY2023 reached 36 million tons and has continued to remain high at approximately 35–40 million tons per year. We have increased our presence in the global market based on one of the largest LNG procurement portfolios in the world. Since FY2019, we have further strengthened fuel supply stability by optimizing procurement and resale flexibility through JERA GM. We also capitalize on profit opportunities in the market and ensure the smooth operation of our business, which is achieved by leveraging our market intelligence gained in the global market.



Our Goal for 2035



As a fuel supplier, we are committed to supporting the expansion of energy supply infrastructure using low-carbon thermal power and contributing to decarbonization in Japan, Asia, and the world.

Ryosuke Tsugaru

Chief Low Carbon Fuel Officer (CLCFO) and Head of the LNG Division

As part of JERA's growth strategy to realize the 2035 Vision, we have set a target of reducing CO₂ emissions from our domestic operations by more than 60% by 2035. Achieving this target will require the development of hydrogen & ammonia, and renewable energy as well as the continued development of LNG projects, with LNG serving as a transition fuel for its relatively low CO₂ emissions and high stability. To date, we have kept our fuel business stable and competitive by leveraging assets that include having one of the world's largest LNG procurement operations, upstream gas fields and LNG liquefaction terminals, and our own LNG cargo fleet. These areas are highly specialized, so we train and deploy personnel who are skilled in LNG procurement, business development, and management.

This platform also plays a crucial role in global decarbonization initiatives, particularly in Asia, where demand for LNG is expected to increase during the transition to a low-carbon economy. By providing competitive fuel solutions through our flagship fuel business, we support the global drive toward decarbonization based on implementing low-carbon thermal power and zero-emission thermal power in the future.



JERA will maintain flexibility across the entire value chain in response to changes in the business environment and contribute to the sustainable growth of society by ensuring a continuous and stable supply.

Kazunori Kasai Senior Managing Executive Officer and Chief Optimization Officer (COPTO)

A defining characteristic of our operations is the optimization business that connects the Pacific and Atlantic markets through JERA GM. By leveraging JERA GM's extensive network and trading expertise, we are able to achieve both stable supply and securing profits through transactions with a large number of customers. We are also moving forward with plans to leverage the knowledge gained from our current business processes and risk management in LNG and coal trading and extend it to other commodities on a global scale.

The business environment surrounding our company is undergoing significant changes, including fuel market volatility resulting from shifting international conditions and increasingly complex power operations due to the introduction of diverse power sources, including renewable energy. Nevertheless, we will help realize a society that can grow sustainably, continuing to provide a stable supply in our pursuit of optimization across the entire value chain and implementation of appropriate risk management.

Business Initiatives Fuel Business

FOCUS Fuel Trading by JERA GM – Supporting Communities through Energy Security

JERA GM operates one of the largest energy portfolios in the world, which gives it an in-depth understanding into the dynamics of local, regional, and international energy markets. These insights enable it to help its customers increase their security of supply, optimize their portfolios, and improve the risk management of their assets. JERA GM manages all coal and short-term LNG procurement for JERA while maximizing value through optimization and trading.

JERA GM is the culmination of two different but complementary business activities—Japanese fuel procurement and European energy trading—creating a global trading business with seamlessly interconnected operations across four strategic locations, with full coverage of the physical and financial energy markets. In addition, by collaborating with JERA Power Trading Co., Inc.*, which is engaged in electricity trading, we are contributing to the revitalization of the domestic electricity market and value creation through these efforts.

*JERA Power Trading Co., Inc., is a power trader in the domestic thermal power generation and gas business

JERA GM Business Locations and LNG Supply Routes NIC IONDON Headcount: ~100 NORTH AMERICA TOKYO Headcount: 5 Headcount: 10 **DUNKIRK TERMINAL** JAPAN FREEPORT BINTULU CALCASIEU PASS **BRUNEI LNG** CORPUS CHRISTI CAMERON SINGAPORE Headcount: 180+ PNG LNG GORGON DARWIN WHEATSTONE

Table of Contents / Editorial Policy About JERA Medium and Long-Term Strategy Business Initiatives The Infrastructure Behind Our Strategies Data [\u03c6 | \u03c6]

Strengths of JERA GM



VOICE a

Pursuing energy security and value for shareholders through its asset-backed trading business model

Justin Rowland JERA Global Markets CEO

As a leading global energy trader, JERA GM leverages its extensive network, market intelligence and expertise in trading to closely support JERA's energy procurement strategy. As we continue to build out additional fundamental strategies to reinforce flexibility in our portfolios, our focus remains to continue to capture and maximize value from the markets while staying true to our mission to provide energy security to our shareholders and the communities that we serve. The ever-evolving volatility in global energy markets requires us to be agile in our strategies and operations, collaborating closely with JERA to manage supply and demand dynamics.

Overseas Power Generation and Renewable Energy Business

Business Overview

Overseas Power Generation

We operate close to 30 overseas power generation projects across 10 countries, and we are continuing to expand our operations by leveraging our expertise in the development and operation of numerous large-scale power plants both domestically and abroad. Particularly in Asia, we are collaborating with platform-based companies that span multiple business domains, advancing not only power



infrastructure development but also ensuring stable LNG supply and promoting decarbonization efforts. The business landscape surrounding energy is rapidly evolving due to policy shifts, market changes, advancements in renewable energy, and carbon-reduction technologies. Moreover, the needs of each country and region are unique. In light of these diverse landscapes, it is essential to move our business forward by leveraging the experience and trust we have built through past projects and to swiftly propose and implement optimal solutions to meet this changing environment. That is why we are collaborating with partners around the world, including platform-based companies, to deliver business solutions suitable for the needs of each region.

Renewable Energy

We plan to consolidate our renewable energy business, both domestically and abroad, around our European base of operations. By partnering with local teams in each region, we aim to establish a "glocal" (global + local) structure. In offshore wind, where significant growth is anticipated, we are also intensifying our efforts in floating wind technology, a new frontier in the field. In addition to offshore wind power, we



will actively pursue our solar power generation business in Japan and expand our solar and onshore wind power generation businesses in North America, India, and other countries. At the same time, we will also work on battery storage solutions in each country, which will contribute to stabilize the supply-demand balance.

Distinguishing Features

Medium and Long-Term

Table of Contents /

Editorial Policy

• Leading the way in initiatives and insights into decarbonization technologies

About JERA

- Development, construction, and operation of offshore wind power generation, which is rare among Japanese companies
- Selection of the latest and most optimal measures through collaboration with overseas development groups

lssues

Strengths

- Strengthening of specialists and organizational capabilities
- Enhancing the renewable energy supply chain in Japan and Asia
- Expanding the scale of development to gain further bargaining power

Opportunities

• Increase in demand for electricity due to new demand for AI

The Infrastructure Behind

Our Strategies

- Global trend toward decarbonization
- Expansion and maturation of the renewable energy market
- Increased demand for storage batteries as a balancing force

Risks

- Inflation and cost increases
- Insufficient coordination with the expansion of renewable energy
- Negative impact of geopolitical risks
- Uncertainty in development due to external factors such as changes in the bidding system, vulnerabilities in the grid at locations suitable for renewable energy, and more

Utilizing Business Capital

Drawing on experience gained from our projects around the world as well as the global expertise of our diverse team of professionals, we come together to pool our knowledge and ideas. By collaborating with like-minded partners, we are committed to addressing global energy challenges.

Key Business Capital

Human Capital

- Achieving a diverse portfolio of talent
- Reinforcing renewable energy talent through new hires and M&A
- Intellectual Capital
 - Pioneering insights into decarbonization technologies
- Transferring insights and expertise of overseas renewable energy to the domestic market

/alue Provided • Aiding

Manufacturing Capital

countries

Social Capital

• Number of Projects: ≈30 projects in more than 10

Leveraging networks developed through projects

Collaborating with platform-based companies

Contributing to decarbonization initiatives tailored to the needs of each country
 Aiding in decarbonization and ensuring stable electricity supply through the introduction and expansion of renewable energy

Overseas Power Generation and Renewable Energy Business

The Infrastructure Behind Data Data

Issue Awareness

Overseas Power Generation

We are seeking a path toward building an optimal power supply portfolio to realize a decarbonized society amid diverse economic conditions, energy supply and demand, infrastructure development, and other factors in each country and region. To achieve this, we are working with governments and companies worldwide to develop roadmaps and other initiatives toward a decarbonized society.

Renewable Energy

We have been proactively working on the introduction of renewable energy. However, over the past two years, we have faced challenges such as rising interest rates and supply chain issues. The decision to invest in projects is carefully evaluated based on strict internal investment criteria, so we have launched a new company called JERA Nex to tackle projects requiring advanced technical skills and engage in projects at earlier stages.

Positioning within the Value Chain

We are engaged in the development and operation of gas-fired power generation and renewable energy projects in Japan as well as across various regions worldwide, including Asia, the Middle East, Europe, and North America. In our gas-fired power generation development, we are actively involved in the procurement of fuel and supplying LNG in addition to infrastructure development in our goals to achieve a stable energy supply throughout the entire value chain. Furthermore, as we look toward decarbonizing thermal power, we are exploring the use of new fuels such as hydrogen & ammonia, as well as the application of carbon capture and storage (CCS). Alongside our aggressive development of renewable energy both domestically and abroad, we are working to provide optimal solutions tailored to each region.

Key Business Indicators and Revenue Generation

To effectively conduct our business and consistently meet the expectations of our stakeholders, it is imperative that we continually commit to renewable energy development. As of 2023, we have developed renewable energy projects totaling 3.4 GW. With the

Renewable Energy Development Output FY2023 results: **3.4 GW** Renewable Energy Development Capacity Goal for 2035: **20 GW**

establishment of JERA Nex, a new company specializing in renewable energy, we aim to strengthen our development capabilities further and become a world-class renewable energy provider. Through this growth, we will achieve a robust global expansion of renewable energy projects.

Specifically, as we carefully assess the current market conditions and make disciplined investment decisions in high-quality projects, we have set a target for a renewable energy development capacity totaling 20 GW by 2035. The further expansion of renewable energy domestically and internationally with LNG, hydrogen, and ammonia is expected to create synergy with our other businesses.

The Goal for 2035



We are committed to providing optimal solutions to ensure stable energy supply, economic viability, and decarbonization with a focus on regions in Asia.

Steven Winn Chief Global Strategist (CGS)

In line with the global trend toward decarbonization, it is essential that we progressively

advance toward energy transition. LNG, a low-carbon fuel, will be a crucial part of the clean energy supply, combining renewable energy and low-carbon thermal power. That is why we are actively promoting the adoption of LNG, particularly in Asia, while advancing conversion toward zero-emission thermal power by switching fuel to hydrogen & ammonia. To achieve our 2035 Vision, we are focusing on developing and securing talent with expertise across the entire value chain, from fuel procurement to power generation. In addition, we will continue to operate and establish projects rooted in various countries and regions through collaboration with our bases in Asia, the Middle East, and North America, including the platform-based companies in each country.



We will contribute to global decarbonization by leveraging our expertise in renewable energy and creating synergy with other businesses.

Nathalie Oosterlinck CEO, JERA Nex Ltd.

The launch of JERA Nex marks a significant new step in our renewable energy business. By

establishing a company that specializes in renewable energy, we aim to integrate existing projects and our experienced global team to scale up rapidly and achieve our development goal of 20 GW by 2035. As we reflect on this past year, we are pleased to report that we have completed several projects, including a 0.25 GW offshore wind farm in Germany; a 0.112 GW wind farm at lshikari Bay New Port in Japan, and two critical projects: the offshore wind projects off the coast of Oga, Katagami, and Akita City in Akita Prefecture; and Norway's first offshore wind auction, "Sørlige Nordsjø II Phase 1." We have a strong track record in the field of renewable energy, and we plan to leverage the expertise of JERA Nex while collaborating with our other businesses to provide comprehensive solutions and contribute to global decarbonization.

Business Initiatives

Overseas Power Generation and Renewable Energy Business

Scaling up our clean platform of renewables and low carbon thermal power, sparking sustainable development in Asia and around the world.

Through collaboration with platform-based companies in each country, we provide optimal solutions to help countries secure a stable energy supply and economic viability to contribute toward a decarbonized society.

Table of Contents /

Editorial Policy

About JERA

Medium and Long-Term

Our overseas power generation businesses are based in Asia, the Middle East, and North America, promoting the operation and development of projects rooted in each region. JERA Nex serves as the central hub of our renewable energy business, working in collaboration with other bases to develop, operate, and manage projects in each region.



Overseas Sites

Data

JERA Asia

The Infrastructure Behind

Our Strategies

JERA Middle East & Africa

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- JERA Americas
- JERA Nex
- PT JERA Energi Indonesia
- JERA Philippines
- JERA Power (Thailand)
- JERA Beijing
- JERA Energy Vietnam
- JERA Energy India
- JERA Energy Taiwan

FOCUS Toward Decarbonization in Asia



Izumi Kai

CEO, JERA Asia Pte. Ltd.

Head of the Platform Business Division

We are advancing research and developing low-carbon emission projects to achieve decarbonization throughout Asia. For example, in response to a request from Indonesia's stateowned electricity company PLN Group, we are assisting in formulating a decarbonization roadmap for thermal power generation in the country. In Bangladesh, we are exploring the expansion of renewable energy and LNG power generation in collaboration with Summit Power International, one of our platform-based companies. Here, we aim to meet the growing electricity demand driven by economic growth while reducing CO₂ emissions. We will continue to contribute to a clean energy supply platform tailored to each country's diverse needs. This will include pursuing optimal solutions such as the potential conversion of thermal power generation fuel to clean ammonia or hydrogen.



Domestic Thermal Power Generation and Gas Business

Energy Challenge

About JERA

Medium and Long-Term Strategy

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Utilizing Business Capital

We benefit from a versatile workforce of professionals across a variety of technical fields, such as plant operation, facility engineering, and data analysis, allowing us to leverage our operational expertise across our wide array of thermal power generation facilities. This positions us to provide a distinctly superior level of service compared to our competitors, both at home and abroad.

Key Business Capital

Manufacturing Capital

- Power plants in Japan: 26 stations^{*1} (Domestic power generation capacity: 59 GW)
- Number of LNG receiving terminals in Japan: 11*2 (LNG tank capacity: 6.62 million kl)



- Social Capital
- our power plants

Human Capital

- Approx. 3,000 professionals in specialized technical fields
- Intellectual Capital

The Infrastructure Behind

Our Strategies

- Operational expertise in thermal power generation cultivated over many years of experience
- Knowledge of the electricity market
- Expertise in fuel procurement and power operations
- Natural Capital
 - Total energy consumption: 48 million kl (crude oil equivalent)
 - LNG/LPG consumption: 23 million tons
 - Coal consumption: 24 million tons*3
- *1 Includes power plants under construction *2 Includes jointly operated LNG terminals *3 Totaled on a wet basis (arias received)

A stable energy supply

• Affordable prices • Promoting the transition to a decarbonized society • A stable supply of fuel

Business Overview

Domestic Thermal Power Generation

The domestic thermal power generation business requires both flexibility to meet fluctuating demand and reliability to ensure a stable supply of electricity. We operate Japan's largest-scale power generation facilities and have honed our expertise and operational techniques over many years, enabling us to provide an economical and stable supply of electricity.

In response to the growing need for a decarbonized society, we are also promoting the transition to fuels that do not emit CO₂ when burned.

Electricity and Gas Sales

JERA's supply capabilities are based on our excellent track record of thermal power generation and operational experience, with our large-scale fuel contracts acting as the linchpin in our efforts to sell electricity and gas to meet the diverse needs of our customers. Furthermore, JERA Power Trading has leveraged its understanding of the market and its trading skills to produce reliable results in electric power trading.

Distinguishing Features

Strengths

- Professional teams in each area of technical expertise
- Operational knowledge of thermal power generation cultivated over
- many years, paired with a wide range of facilities Acquisition of pioneering ammonia technologies
- Competitive and flexible fuel procurement portfolio
- Market trading expertise

Issues

- Workforce shrinkage due to aging population and declining birth rate
- Large fluctuations in resource prices and demand for thermal power
- Efficient use of accumulated tools and techniques

Opportunities

- Advances in AI and digital technology
- The growing need for a decarbonized society
- Improved liquidity in the domestic electricity market
- Diversifying customer needs in electricity and gas sales

Field Expertise

Market Responsiveness

Cost Competitiveness

Adaptability to New Technology

Professional Personnel

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- Risks
- Negative impact of geopolitical risks on fuel procurement
- Risk of natural disasters such as major earthquakes
- Operational disruptions due to issues at facilities



- Promoting engagement with communities around

Issue Awareness in the Domestic Thermal Power Generation and Gas Business

A Shrinking Workforce due to an Aging Population and a Declining Birth Rate

Japan's declining birth rate and aging workforce make it essential to secure outstanding talent and train the next generation in preparation for the retirement of veteran engineers.

At JERA, we are securing engineers by strengthening our initiatives in mid-career hires and non-Japanese personnel recruitment. We are also promoting digital transformation to improve our operational tools and techniques for power generation, such as by formalizing tacit knowledge held by our veteran engineers in order to better pass it on to the next generation.

Large Fluctuations in Resource Prices and Demand for Thermal Power

Shifts in resource prices and fluctuations in demand for thermal power due to the growing prevalence of renewable energy sources represent challenges for us. Nonetheless, we flexibly adapt to these fluctuating resource prices by utilizing diverse fuel procurement sources and trading strategies. Furthermore, our enhanced flexibility in facility operations and other areas strengthens our market responsiveness, enabling us to address fluctuations in demand for domestic thermal power.

Positioning within the Value Chain

As Japan's largest power company, we manage our fuel procurement and power generation portfolio for optimal effect, combining this with our technologies for operating and maintaining power generation facilities to maximize asset value and power sales opportunities, thereby ensuring an economical and stable supply.

We utilize the electric power market to contribute to overall market growth and development and seek to provide solutions that meet new customer needs. Our initiatives reflect environmental values that include CO₂ emission-free energy and the value related to flexibility in accommodating both short-term fluctuations in supply and demand caused by changing weather over the course of the day and night, as well as long-term fluctuations associated with seasonal changes.



Key Business Indicators and Revenue Generation

Medium and Long-Term

Strategy

We boast some of the world's largest power generation facilities and supply approximately 30% of Japan's electricity. We are replacing a total of 4.31 GW at our aging Yokosuka, Anegasaki, and Taketoyo facilities to maintain a stable supply. Beyond FY2024, we also plan to replace a total of 3.52 GW at our Goi and Chita stations. This is our ongoing commitment to maintaining a stable supply while conducting replacements to ensure profitability through improved efficiency.

About JERA



The Infrastructure Behind

Our Strategies

* Source: Agency for Natural Resources and Energy website: https://www.enecho.meti.go.jp/statistics/electric_power/ep002/ (Japanese)

Our Goal for 2035



Table of Contents /

Editorial Policy

We equip professionals with the skills needed to contribute to the realization of a stable energy supply and a decarbonized society.

Tetsuya Watabe Corporate Vice President, Managing Executive Officer, Chief 0&M Engineering Officer (COMEO)

JERA's Domestic Thermal Power and Gas Business supports Japan's access to a stable energy supply. From power generation to fuel procurement and trading, all aspects of our operations enable us to respond flexibly to fluctuations in resource prices and renewable energy output.

We serve an important role in supporting people's lives and encouraging regional development, and JERA's ranks are full of professionals with a strong sense of mission.

Japan's social structure will change as the birth rate declines and the population ages. We will address these changes by expanding on JERA-DPP® to realize new work innovations while further improving our existing on-site operational strengths both domestically and abroad.

At the Hekinan Thermal Power Station, we successfully completed the world's first demonstration of conversion of 20% ammonia fuel in a large-scale commercial power plant. This represents a major step toward making zero-emission thermal power generation a reality, and we will continue our unflagging efforts as we push ourselves to implement new technologies in society.

Business Initiatives

Domestic Thermal Power Generation and Gas Business

FOCUS Digital Power Plant (DPP)

JERA-DPP®

JERA continues to expand on JERA-DPP® as a solution for transforming the 0&M of power plants. We fuse cutting-edge digital technology with the data and knowledge we have accumulated over our long history of operating some of the world's largest power generation facilities, enabling us to combine power plants, head offices, branch locations, and partners into an integrated and advanced digital power plant (DPP) solution.

JERA-DPP[®] consists of "DPP Package," an application we developed in-house, and "G-DAC," our Global Data Analyzing Center that remotely provides advanced data analysis. Our goal is to introduce JERA-DPP[®] in all power plants by 2025 and encourage the spread of generative AI in our operations, leveraging this technology to achieve major work innovations.



DPP Package

JERA's DPP Package aggregates data on power plant equipment and personnel in the cloud, visualizing and sharing this data and information in real time. One application, "Technologies of professionals," developed in-house at JERA, also digitally transforms the expertise of our 0&M experts to optimize performance management and maintenance at power plants.

Utilizing these applications to visualize all work styles and approaches in our power plant operations contributes to increased profits by ensuring that our operations are data-driven.



Sharing on-site data and facility management information



Applying our expertise to enhance maintenance

VOICE

Human Expertise Goes Digital

Hiroaki Kamei O&M Engineering Advanced Technology Division Head of Digital Power Plant Promotion Group

Generative AI holds the potential to reshape the way we engineers work. Generative AI can study past issues at facilities and operational knowledge, synthesizing veteran engineers' work and ideas to provide younger, inexperienced engineers with immediate and practical solutions. In the face of declining birth rates and an aging population, we are committed to delivering solutions that preserve the excellence of the past for a brighter future.

G-DAC

Table of Contents /

Editorial Policy

In July 2023, we established the Global Data Analyzing Center (G-DAC) as a remote, integrated division with the purpose of providing information and data analysis in real time, alongside cutting-edge 0&M solutions, to domestic and international power generation facilities. G-DAC provides advanced analysis services 24 hours a day, not only for our own power generation facilities in Japan but also for those of our customers, including their overseas locations.

The Infrastructure Behind

Our Strategies

[← | →]

Data

Medium and Long-Term

About JERA



Business Initiatives Initiatives at Thermal Power Plants in Japan

Accelerating Decarbonization While Ensuring Stable Supply at Hekinan Thermal Power Station

Hekinan Thermal Power Station, located in the southern part of Hekinan City in Aichi Prefecture, is a coal-fired power plant.

Since the start of commercial operations for Unit 1 in October 1991, we have continued to add power generation equipment, and with the commencement of Unit 5 in 2002, Hekinan became the largest coal-fired power plant in Japan and one of the largest in the world, with a total output of 4.1 GW, ensuring a reliable supply of energy in Japan.

At the same time, Hekinan is also tackling the conversion to ammonia fuel, which does not emit CO₂ when burned. Retrofitting the plant for ammonia fuel is being managed efficiently without affecting the normal operations of the existing infrastructure.

Demonstration Tests and Future Plans

On April 1, 2024, we began the world's first demonstration test of 20% fuel conversion* to ammonia at Hekinan Thermal Power Station Unit 4, our large-scale commercial coal-fired power plant. By April 10, we had achieved a 20% conversion at the rated output of 1 GW.

Results of this demonstration testing were positive, confirming that the level of nitrogen oxides (NOx), which have a negative effect on the ecosystem, generated was no higher than before fuel ammonia conversion (than when firing coal alone); a 20% reduction in sulfur oxides (SOx); and that generation of N₂O, which has a strong greenhouse effect, was below the threshold for detection. In addition, positive outcomes were achieved in both the combustion conditions and operational responsiveness of the boiler and ammonia fuel systems, marking significant progress toward commercialization.

Going forward, we will perform detailed data assessments and start construction aimed at commercial operations using large-volume fuel ammonia conversion, targeting the late 2020s for the commencement of commercial operations.

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

Featured Accumulating Expertise in Fuel Ammonia

Prior to the demonstration testing of 20% ammonia conversion, we conducted verification tests of ammonia burners in an actual combustion environment at Hekinan Unit 5 in FY2021. We are now applying the insights gained from those tests in our 20% ammonia conversion demonstrations, helping us to accumulate expertise in equipment configuration and operation. In addition, because ammonia is classified as a hazardous substance, we have implemented a three-tiered safety manual covering prevention, early detection, and leakage containment. We also have a comprehensive system in place to ensure readiness in case of emergency, which includes working closely with local fire departments and municipalities. We plan to expand this expertise in fuel ammonia across Japan and overseas.



Medium and Long-Term

Stratem

Table of Contents /

Editorial Policy

AN ANNA TO

About JERA



The Infrastructure Behind

Our Strategies

 $\left(\leftrightarrow \right) \rightarrow$

Data



Mitsutaka Ban O&M Engineering Operation Division General Manager, Head of the Hekinan Thermal Power Station

Message from the Head of the Hekinan Thermal Power Station

The large-scale demonstration of ammonia conversion testing has attracted global attention and is a source of great daily focus and motivation for both our power plant staff and partner companies. Above all, we are constantly mindful of ensuring the safety of local residents and everyone working on-site, as well as delivering a stable supply of electricity. Amid new initiatives and significant challenges, we are committed to remain calm, composed, and persistent in our efforts.

Information Technology (IT) / Digital Transformation (DX)

Transformation into a Data-Driven Global Company



At JERA, we aim to become Japan's first global energy company by promoting operational efficiency and improvement and by creating new business value through the use of data and cutting-edge technology in pursuit of a decarbonized society.

Celso Guiotoko

Digital Strategy Policy

Our digital strategy is focused on directly contributing to business outcomes by providing a business platform that enables JERA's global business expansion strategy. This includes streamlining the business value chain, optimizing asset portfolios, digitizing power plants, and digitizing the workplace.

We must transform our business into a data-driven model to accelerate decision-making and become more customer-centric and competitive. To that end, we aim to provide a global platform that enables data-driven management across all business operations.

Major Initiatives for FY2024

- (1) Enterprise transformation: Streamline business processes and data to achieve data-driven management. Utilize data analysis to optimize business processes and foster a culture of data-driven decision-making.
- (2) Globalization: Standardize ICT services globally and connect regions, countries, and locations in a federated format.
- (3) Strengthening our delivery structures: Enhance development and operation structures with partners and build a co-creation structure for business and ICT.



Major Projects

Program4: Contributing to data streamlining and rapid decision-making

At JERA, we are working on introducing S/4HANA, the latest version of SAP, an integrated core business system that enables centralized management of a company's human, material, capital, and information resources. This project, called "Program4," aims to standardize data and business processes and promote information sharing based on S/4HANA, achieving data-driven corporate management based on real-time data.

Many of the global issues that require a solution are closely related to energy. Our company, too, faces challenges such as climate change and geopolitical risks. By building a data platform that aggregates real-time data, we aim to conduct predictive management to anticipate potential problems and enable agile, data-driven management decisions.

As stated in our Growth Strategy, this data platform is essential to driving decisions and achieving both Strategic Positioning and Operational Capabilities.

Once we implement S/4HANA, we can start accumulating data, which will aid us in measuring the JERA Group by the same metrics, both domestically and internationally. With the immediate availability of necessary information for management decisions, the management team can make swift decisions. By standardizing business processes, employees can reduce the time required for information gathering and focus on higher value-added tasks such as analysis and planning.

Through Program4, we will build a data platform that contributes to our Strategic Positioning and Operational Capabilities, thereby increasing corporate agility and enhancing corporate value.



Digital Innovation (DI)

Accelerating Decarbonization with AI and Cutting-Edge Technologies



Chief Digital Innovations Officer (CC Sami Ben Jamaa

The Importance of Digital Innovation at JERA

At JERA, we must fulfill our social responsibilities in areas such as energy supply while enhancing our global competitiveness. To achieve this, it is essential that we fully leverage our expertise and know-how in power facilities using Al and digital technologies.

Providing Digital Solutions

As Chief Digital Innovations Officer (CDIO), I am responsible for driving digital innovations through AI and other digital technologies. I am committed to contributing to both operational innovation within the JERA Group and the realization of our growth strategy. Leveraging successful digital transformation (DX) projects across our domestic power generation facilities, we have provided digital solutions to our group companies outside of Japan. As we move forward, we aim to expand our solutions, including generative AI, to enhance our business and thrive in the global energy market. We also plan to explore advanced technologies such as CO₂ emission tracking and virtual power plants (VPP) to support the creation of a decarbonized society. Case Study: Deployment of digital power plants (DPP) and anomaly detection systems at domestic power plants.

Strengthening the Global Digital Ecosystem

Achieving these goals requires talent capable of bridging business with the digital side and enhancing our digital ecosystem. We are committed to actively recruiting and developing DX talent within our group, as well as deepening our collaboration with global partners through programs such as Free Electrons*. In addition, we are considering establishing a digital subsidiary to foster a culture of innovation and promote the rapid and flexible development of advanced technologies to provide cutting-edge digital solutions.

* Free Electrons: An open innovation program that connects start-ups with world-leading energy utilities

Strategic Innovation

Table of Contents /

Editorial Policy

About JERA

Utilizing cutting-edge digital technologies to enhance energy flexibility and accelerate the energy transition

Medium and Long-Term

Strategy

The Infrastructure Behind

Our Strategies

 $| \in | \rightarrow]$

Data



Realization of Our Growth Strategy Enhancing Operational Capabilities

Al and digital technologies are central to the operational capabilities emphasized in our growth strategy. By integrating advanced technologies into our business, we are committed to enhancing these capabilities and contributing to our growth strategy through the digital development of our group's human resources.

