

Jera

Energy for a New Era



JERA GROUP INTEGRATED REPORT 2023

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Cover Photos

Left: Offshore wind power generation project at Parkwind (Belgium), acquired by JERA in 2023

Right: Hekinan Thermal Power Station (Aichi Prefecture), the world's first attempt at zero-emission thermal power generation

Editorial Policy

About This Report

JERA Group Integrated Report 2023 serves as a structured overview of group initiatives and is grounded in our corporate value creation story, driving us closer to achieving our mission and vision. It is designed as a communication tool for a diverse range of stakeholders—investors, local residents, students, and more—to deepen their understanding of our young company, which was only established in 2015. We hope this report will assist in enhancing readers' understanding of the situation amidst the significant shifts in the energy landscape both in Japan and around the world.

Moving forward, we will continue to refine our approach, striving for greater clarity and drawing on feedback from all of our stakeholders.

Notes on Predictions

Descriptions in this report pertaining to the JERA Group's future plans, forecasts, and strategies are based on information available at the time of publication. As these descriptions contain potential risks and uncertainties, please note that actual performance may differ from the content of this report.

Scope of this Report	In general, JERA Co., Inc., and related companies (All mentions of "the company," "we," and "our" in this report refer to JERA Co., Inc. unless otherwise noted.)
Reporting Period	FY2022 (April 1, 2022–March 31, 2023) Some sections may include activities after FY2022.
Date of Publication	November 2023 (FY2023 report scheduled for October 2024)
Reference Guidelines	● <i>International Integrated Reporting Framework</i>, International Financial Reporting Standards (IFRS) Foundation ● <i>Guidance for Integrated Corporate Disclosure and Company-Investor Dialogue for Collaborative Value Creation 2.0</i>, Ministry of Economy, Trade and Industry (METI) ● <i>GRI Sustainability Reporting Standards</i>, Global Reporting Initiative ● <i>Environmental Reporting Guidelines 2018</i>, Ministry of the Environment ● <i>Recommendations of the Task Force on Climate-related Financial Disclosures (Final Report)</i>, Task Force on Climate-related Financial Disclosures (TCFD)
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JERA's Value Creation Story

Mission – Why do we exist?

To provide cutting edge solutions to the world's energy issues

– What are the world's energy issues?

- ▶ The crux of the energy dilemma revolves around simultaneously achieving three things: sustainability (realizing a decarbonized society), affordability (providing electricity to all), and stability (ensuring a secure supply).
- ▶ Each country and region has its unique environment, so the weight placed on these three objectives and how they will be achieved will also differ.

– How do we provide cutting edge solutions?

- ▶ Through our global operations, we bring the world's leading energy solutions to Japan, helping to solve the energy issues facing the country.
- ▶ We seek to establish new energy supply models for Japan and offer them to other countries that face similar energy issues, helping to solve the world's energy issues.

Vision

Describe JERA in 2035

**To scale up its clean energy platform of renewables
and low greenhouse gas thermal power, sparking
sustainable development in Asia and around the world**

Medium and Long-Term Strategy

Balancing Stable Supply and Decarbonization

JERA Zero CO₂ Emissions 2050

Clean Energy Supply Platform

Low-carbon Thermal Power x Expansion of Renewable Energy

Transportation/Receiving/Storage

Creation of Fuel Procurement Portfolio

Fuel Upstream Development

From Coal and LNG to Ammonia and Hydrogen

Digital Transformation (DX)

Technological Development

Infrastructure

E (Environment)

- Climate change mitigation
- Water quality usage and conservation
- Initiatives related to resource recycling
- Maintenance and management of waste treatment facilities
- Biodiversity conservation

S (Society)

- Talent acquisition and retention strategy
- Commitment to human rights
- Coexistence with local communities
- Safety initiatives
- Stakeholder engagement

G (Governance)

- Proper corporate governance
- Risk management
- Improving information security
- Compliance promotion

At a Glance

JERA is an energy company that spans the entire value chain, from the fuel upstream business and procurement through power generation and wholesaling of electricity and gas. As a global company with the largest power generation capacity in Japan and capable of handling some of the largest fuel volumes in the world, we are committed to solving the world's energy problems and leading the way in creating a decarbonized society.



Business Overview

Fuel Business

Investment in fuel upstream and other businesses, fuel transportation, and fuel trading

Major Projects ■ Major Group Companies ◆

Domestic Thermal Power Generation and Gas Business

Thermal power generation in Japan, fuel procurement, O&M engineering, sale of electricity and gas in Japan, etc.

Major Projects ■ Major Group Companies ◆

Overseas Power Generation and Renewable Energy Business

Investment in overseas power generation projects, etc. Development and operation of renewable energy in Japan and overseas

Major Projects ■ Major Group Companies ◆

Number of employees (consolidated)	5,295
Revenue*1	Approx. 4.7 trillion yen
Total assets	Approx. 9.1 trillion yen

LNG Transaction Volume (annual)*1	One of the World's Largest Approx. 35 million t
LNG Suppliers	15 countries
Number of Upstream Investments	6

Thermal Power Plants in Japan	26
Power Generation Capacity in Japan*2	#1 in Japan Approx. 6,100 MW
Power Generation Output in Japan*1, *2	Approx. 30% of country total Approx. 235.0 billion kWh

Number of Overseas Power Projects	Approx. 30
Overseas Business Locations	10 + Countries
Overseas Power Generation Capacity (Equity output) *2	Approx. 1,240 GW

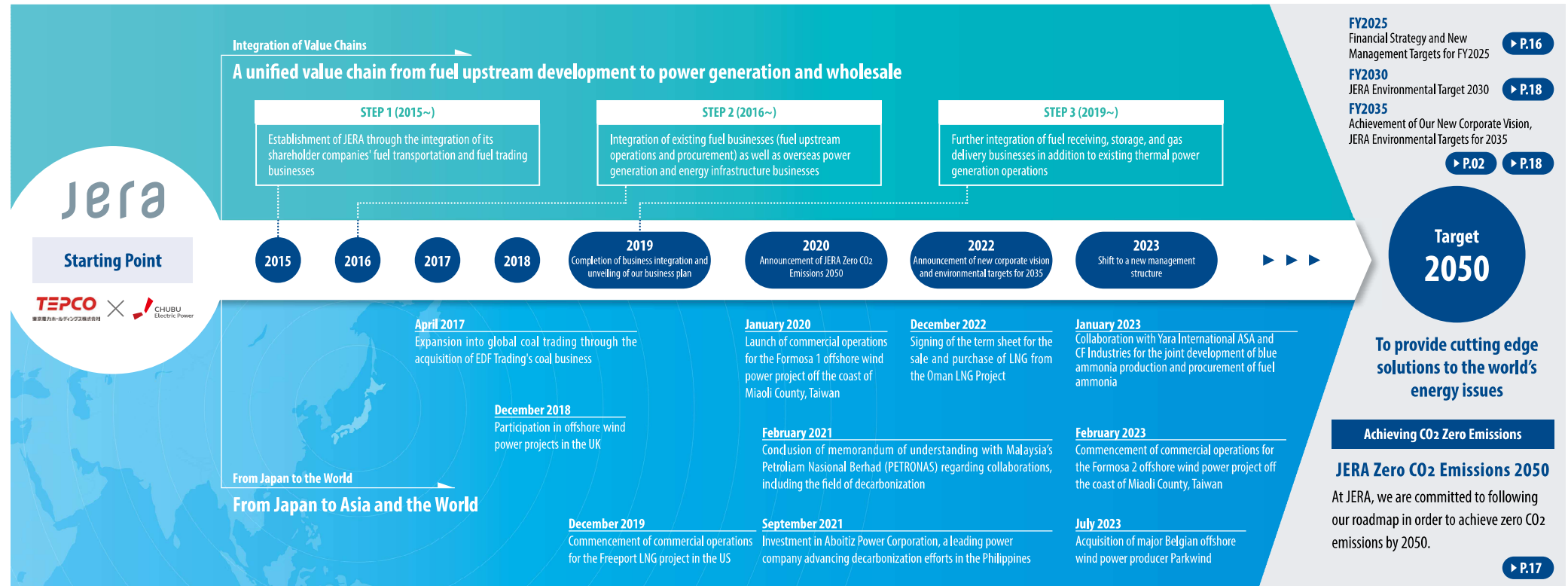
As of March 31, 2023

*1 FY2022

*2 Includes facilities under construction. Domestic figures exclude joint thermal power holdings.

History of JERA

Driving the Push Toward a Decarbonized Society as a Clean Energy Company



A Turning Point in Energy Policy

Following the Great East Japan Earthquake in 2011, the role of thermal power generation became increasingly vital to compensate for Japan's electricity shortage. A global energy company capable of contending in the international market was needed to ensure a stable fuel supply for power generation and consistently provide competitive energy. In line with this vision, JERA was created through the consolidation of the fuel and thermal power departments of Tokyo Electric Power Company and Chubu Electric Power Company.

Accelerating Decarbonization

The rapid progression of global warming has made addressing climate change an urgent issue, and the 2015 Paris Agreement has led to stricter regulations on fossil fuels globally. After the completion of our business integration in 2019, JERA emerged as an energy company boasting Japan's largest thermal power generation capacity and one of the world's largest fuel transaction volumes. Focused on realizing a decarbonized society and establishing a robust management foundation, in April 2019, we formulated our mission, vision, and business plan leading up to FY2025. Further, in October 2020, as part of our commitment to lead the move towards a decarbonized society, we announced JERA Zero CO₂ Emissions 2050.

A Drastically Changing External Environment

While renewable energy is becoming more widespread, its susceptibility to weather patterns highlights an increasing need to compensate for its instability as a power source. Against this backdrop, 2022 saw the eruption of conflicts over energy resources due to Russia's invasion of Ukraine, further complicating the environment surrounding our company, and momentum towards a decarbonized society grows stronger each day. Recognizing our mission to balance decarbonization with a stable supply of energy, in May 2022, we set forth a new corporate vision and environmental targets for 2035. At the same time, we announced financial strategy and new management targets for FY2025.

Preparing for 2050

Our global operations are bringing the world's leading energy solutions to Japan to solve the energy issues facing the country. We seek to establish new energy supply models for Japan while also offering energy supply models established in Japan to other countries that face similar energy issues, in turn helping to solve energy issues around the world.

JERA's Co-CEO Structure

Amid dramatic shifts in the energy landscape, our company must address challenges stemming from both the global context of competition for resources and the domestic scenario of ensuring stable power supply amidst deregulation.

To tackle short-term and long-term management challenges both globally and domestically and to fulfill our original objective of growing into a global energy company, we have instituted a co-CEO structure, leveraging the individual strengths of Kani and Okuda and establishing a symbiotic relationship between them to form a robust executive framework.

Kani has extensive international experience in resource and energy business development. He excels at cultivating relationships with global partners and is capable of constructing a global management structure.

Okuda, with experience in corporate planning, is adept at leading the debate about reforming the domestic electric power system, ensuring a stable energy supply, and decarbonizing the energy industry.

The two have worked closely together for a decade, starting with the merger negotiations, capitalizing on each other's strengths as pivotal figures at the core of JERA's operations. Today, they take the helm to move the company forward together.



Co-CEO Kani, Global CEO and Chair (left); Okuda, President, Director, CEO and COO (right)

Message from the Global CEO and Chair



JERA's Destination: The Sentiment Embedded in Our Mission and Vision
Transforming a hierarchical, male-dominated workplace into a flat corporate culture that embraces diversity

Yukio Kani
Global CEO and Chair

Q

As newly appointed Global CEO and Chair, what direction would you like to take JERA in relation to the company's mission, vision, and aspirations since its inception?

Kani: We established JERA with the goal of becoming a global energy company with roots in Japan, and it's been four years since completing the integration of our fuel and thermal power value chains in 2019. My colleagues and I have been fully committed to this journey so far, and the future we envision for JERA is clearly enshrined in our mission and vision.

Firstly, our mission articulates the question, "Why do we exist?" It's a message succinctly conveying our raison d'être and is the touchpoint we always return to. After extensive discussions within the management team about JERA's strategy for global competitiveness in the energy industry, we established the mission to provide cutting edge solutions to the world's energy issues.

Q

Could you elaborate on what is meant by "To provide cutting edge solutions to the world's energy issues"? What are the world's energy issues?

Kani: The energy issues affecting Japan are not necessarily the same as those affecting other parts of the world. As we delve into the individual issues facing Asia, Europe, the Middle East, and Africa, I perceive the crux of the energy dilemma to revolve around simultaneously achieving three things: sustainability (realizing a decarbonized society), affordability (providing electricity to all), and stability (ensuring a secure supply). For instance, Russia's invasion of Ukraine poignantly brought home to Europe, which hitherto prioritized sustainability, the importance of affordability and stability in energy supply while highlighting the challenge of achieving all three simultaneously.

Q

Can you tell us how JERA aims to provide cutting edge solutions that simultaneously achieve sustainability, affordability, and stability?

Kani: Certainly. In addressing these issues, we aim to turn JERA into a global solution provider. It is imperative that those solutions be cutting edge. It's not about merely selling wholesale electricity but building teams and coming up with agile ideas and proposals capable of solving societal challenges and customer concerns that transcend national and generational boundaries. This is by no means an easy journey, but I believe it's an exciting one.

Message from the Global CEO and Chair



What can you tell us about JERA's vision to scale up its clean energy platform of renewables and low greenhouse gas thermal power, sparking sustainable development in Asia and around the world?

Kani: Our vision serves as a more specific illustration of our mission. We aim to provide a stable supply of clean energy by combining three of JERA's strengths: our value chain, which encompasses investment, procurement, transportation, and sales of LNG; renewable energy; and zero-emission thermal power through hydrogen and ammonia. While some companies specialize in either LNG or renewable energy, only JERA, by bringing these diverse options together, can offer cutting edge solutions to the challenges facing our customers. I believe this ability to provide a variety of solutions is a unique value that we possess at JERA.



Could you share a specific example of a clean energy platform that combines those options?

Kani: While there are various initiatives, a domestic example would be the 24/7 carbon-free energy project in collaboration with Toho Studios. The goal is to combine renewable energy sources like solar power and zero-emission thermal power, integrating the latest digital technologies to visualize electricity demand and CO₂ reductions in real-time.



JERA's vision mentions sparking sustainable development in Asia and around the world. Could you elaborate on why there's a particular focus on Asia?

Kani: The situation in many Asian countries, which are resource-poor, surrounded by the sea, or share similar meteorological and marine conditions with Japan, is quite different from continent-centric regions like Europe and the Americas. As economic growth in these places is significant and the demand for electricity is only expected to increase, it's unrealistic to assert, with the same logic as in the West, that only clean energy is acceptable. We aim to contribute to the development of Asia by offering the cutting edge energy supply model we are building in Japan, which combines zero-emission thermal power and renewable energy, and tailoring it to suit the circumstances of each country in the region.

One key example in the Asian region is our 2021 investment in Aboitiz Power, a major power company in the Philippines. To accelerate decarbonization in the Philippines, we are aiming to introduce a balanced mix of LNG and renewable energy while initiating discussions on the feasibility of utilizing ammonia at their coal-fired power plants and contemplating the construction of a domestic hydrogen/ammonia supply chain. Moving forward, we will continue to fulfill our role as a leader in addressing climate change alongside our partners in each country.



Next, could you tell us about the core values underpinning JERA's mission and vision?

Kani: Our core values dictate our non-negotiables. They tell us how we should approach our daily work in order to accomplish our mission and vision. They encompass being fair and open, valuing diversity, and pursuing excellence. Given the size and social obligations of JERA as an organization, we believe that making a positive impact in the world is critical.

Message from the Global CEO and Chair



Could you elaborate on JERA's notion of diversity?

Kani: We want to deliver cutting edge solutions that don't yet exist, and I don't think that's achievable with a homogeneous group of people. I want us to transition from a hierarchical patriarchy to an inclusive, egalitarian culture that welcomes diversity. Regardless of race or nationality, I envision a team where everyone, whether outspoken or reserved, can openly share their opinions, tune into the needs of our clients, and collectively craft solutions. That's my approach to team building and the reason why diversity is so important.



You mentioned the core values of fairness, diversity, excellence, and, lastly, making a positive impact. Could you elaborate on why you include making a positive impact as a core value?

Kani: Given that roughly 70% of the world's CO₂ emissions are energy related, JERA has both a significant impact on climate change as a whole and simultaneously is part of the climate change solution. That's why we are conscious of our potential to make a substantial impact on society, and I believe we must deliver results for the sake of humanity's future.



But there must be a limit to the impact a single company can have on the world.

Kani: You're absolutely right. We can't tackle climate change issues single-handedly—we have to work together with global partners. To be recognized as a peer among leading global companies requires two things. The first is whether we can share our mission and vision, and the other is whether a potential partner has a culture that makes us want to work together. Becoming business partners can mean working together in the same office for decades. If we can't empathize with each other's mission and vision and can't respect each other's culture, it will be quite hard to work together. Conversely, when these all align, we can build solid teams with our partners and move closer to fulfilling our mission and vision.



Lastly, you often emphasize the importance of remaining committed to safety and compliance. This is a critical topic, so could you please share the thought behind your commitment to these principles?

Kani: Safety and compliance are not a matter of priority—they are prerequisites for doing business. I tell our employees and executives that without adhering to these, we have no right to be in business in the first place. Valuing safety means protecting our colleagues and their families. You wouldn't feel safe working for a company that didn't value its employees and their families, would you?

Compliance isn't complicated—it's about basic principles like being honest and following the rules. Non-compliance leads to betraying the company and losing society's trust. I tell all our employees that they should speak up if something feels amiss, no matter how minor.

I am committed to rigorously enforcing safety and compliance to protect all our stakeholders, employees and the company itself.



Message from the President, Director, CEO and COO



Driven by a strong sense of social responsibility and the power of imaginative innovation, at JERA, we are committed to delivering new value through a transitional approach to decarbonization strategies.

Hisahide Okuda
President, Director, CEO and COO



Taking the Helm as President, Director, CEO and COO: My Mission & Aspirations for the Future

Since assuming the position of President, Director, CEO and COO of JERA in April 2023, I have made one thing very clear: at JERA, we believe Japan's challenge today is to create a new platform for delivering stable, economical, clean energy under any circumstances. This is JERA's vision in a nutshell. Realizing this vision requires resonating with both a strong sense of social responsibility and the power of imaginative innovation.

In order to deliver clean energy stably and economically, no matter the circumstances, we must uphold the practices that conventional power companies have refined over their long histories with a strong sense of social responsibility. This includes securing a stable supply and pursuing economic efficiency. However, considering the current landscape of the energy industry, traditional approaches and incremental improvements alone will not suffice. I envision a company capable of reimagining how electricity is produced and utilized and delivering new value through these innovations. But this ambition hinges on the free-spirited, innovative prowess of each of our employees. It is absolutely vital to have both social responsibility and imaginative innovation and to strike an elaborate balance between them.

I will personally take the helm in redefining conventional values and preconceptions, directing our company towards a creative vision that delivers unparalleled value to the world.



A Central Theme: JERA's Responsibility Toward the Realization of a Sustainable Society

To ensure that all life on Earth continues to thrive in peace and abundance and to pass our beautiful planet on to the next generation, it's imperative to pursue integrity, safety, and sustainability across the realms of the economy, society, and environment. As the largest power generator and LNG handler in Japan, and one of the largest in the world, what we do as a business has a significant impact on people's lives and the environment. As such, we have an obligation not only for our own sustainability but also for the sustainability of society as a whole. As an energy provider, we are trying to create a sustainable society around three pillars: stable supply, decarbonization, and digital transformation (DX).

Russia's invasion of Ukraine has drastically altered the flow of resources. The source of Europe's resource supply has shifted from Russia to Asia and the United States. As a result, resource-poor countries have been put in a precarious situation, many of them

Message from the President, Director, CEO and COO

grappling with issues of fuel scarcity. Despite the government's national focus on decarbonization, Japan's unique geographical and climatic conditions mean it lacks much renewable energy potential. This is a situation that cannot easily be overcome.

Even so, we have a system to ensure fuel supply, and we are capable of agile responses in peacetime and crisis. We're also steadily transitioning to the most efficient thermal power generation facilities available today to ensure a stable electricity supply while reducing our environmental impact. Reliable access to electricity is a fundamental requirement for a sustainable society. Even momentary disruption can have a substantially negative impact on society. As such, ensuring a stable power supply is our social obligation.

Furthermore, in alignment with the global objective of decarbonization, we've established JERA Zero CO₂ Emissions 2050, which aims to achieve net-zero CO₂ emissions from our operations in Japan and abroad by 2050. This policy will materialize through renewable energy and zero-emission thermal power generation, reflecting the same earnest commitment to decarbonization to ensure a stable power supply. But I will discuss this in more detail in the next section.

We are also working on using digital technology to build a new supply and demand infrastructure that balances economic viability while fulfilling our mission of ensuring a stable supply and decarbonization. Harnessing digital technology allows us to focus on creating systems that deliver value, such as reducing our environmental impact and responding flexibly to short- and long-term supply and demand fluctuations.

We remain committed to contributing to social sustainability in our corporate activities and ask for your continued confidence and support.



The Path Forward for a Zero-Emission Society: Transition Approaches & Healthy Global Growth in Harmony

Our mission is to provide cutting edge solutions to the world's energy issues, but the world's energy issues vary greatly by time and place. From firewood and charcoal to oil and coal, nuclear power, LNG, and renewables, humanity has cycled through dependence on various energy sources, each presenting its unique set of challenges as civilization has advanced. Today, the most significant trend in energy is unquestionably decarbonization. Seeing decarbonization as non-negotiable for entry into the global energy business, we formulated our JERA Zero CO₂ Emissions 2050 strategy in 2020. Energy is both the lifeblood of industry and daily life and a cornerstone of world peace. We are committed to balancing clean energy with economic stability, all while providing a reliable foundation for energy security.

European nations initially set extremely ambitious decarbonization targets and swiftly pivoted towards renewables, backed by multilaterally interconnected power grids.

Message from the President, Director, CEO and COO

However, I believe that the invasion of Ukraine and the resultant shift in resource and fuel dynamics have shown that relying solely on renewables—and thereby instantly eliminating all fossil fuels and realizing a sustainable society—isn't as straightforward as was once thought. Geographical conditions largely influence the potential of renewable energy. While tackling climate change is a global objective, individual nations and regions face diverse challenges of varying complexity.



Safety is a top priority at Hekinan Thermal Power Station (Hekinan City, Aichi Prefecture), where ammonia demonstration tests are scheduled to begin in FY2023. Safety belts (fall arrest devices) and other safety equipment are being installed across the facility.

In this context, I believe JERA's mission has become even more significant. Energy issues are intricate webs of geographical, economic, and market dynamics; no single nation or challenge can be addressed in isolation. To address this challenge, we adopt and champion a transition approach. Instant divestment from fossil fuels or thermal power plants could jeopardize energy security. Instead, by maximizing the use of existing facilities and reliable technologies and transitioning thermal power plants to decarbonized fuels, we aim to provide stable and cost-effective energy while achieving zero emissions.

Our approach to zero-emission thermal power relies on hydrogen and ammonia as decarbonized fuels. While initially, these fuels may be more expensive than gas or coal, we anticipate that policy support for decarbonization will foster their adoption. Just as the proliferation of LNG led to cost reductions and market growth, hydrogen and ammonia are expected to become widely adopted and more affordable over time. Another strength of zero-emission thermal power is its ability to compensate for the intermittency of renewables. While we are pushing for renewable energy developments worldwide, renewables can also serve as the energy sources needed for hydrogen and ammonia production. Surplus Natural energy can also be converted and stored in the form of hydrogen and ammonia.

Our vision outlines a future where we can scale up its clean energy platform of renewables and low greenhouse gas thermal power, sparking sustainable development in Asia and around the world. Neither renewable energy nor zero-emission thermal power alone is the answer; they are two sides of the same coin. What is needed is a clean energy supply infrastructure where each one complements the other. Rather than a binary choice between renewable energy and thermal power, we are determined to establish a clean energy platform that integrates them, ensuring harmony in healthy global growth and development.



The Power of Imaginative Innovation for Sustainable Growth: Uniting Our Hearts & Minds as One

Our vision of the future is integral to our commitment to sustainability. We believe that resilience, the ability to grow and generate profit even in the face of adversity, and the innovative spirit to drive it are crucial.

With disciplined growth and maximization of corporate value in mind, we've set financial strategies and management targets for 2025. For FY2025, we project a consolidated net profit of 200 billion yen. We have earmarked a total investment of 1.4 trillion

Message from the President, Director, CEO and COO

yen in growth sectors, including a stable energy supply and decarbonization, spanning from FY2022 to FY2025. Furthermore, as a financial health management target, we have announced a Net DER of 1.0 or lower for FY2025. While we cannot let our guard down amidst the changing business environment, our progress toward these goals is generally on track. We plan to announce our next growth targets as soon as we're confident in achieving the current ones. Beyond 2025, we are committed to investing in the areas of renewable energy, hydrogen, and ammonia, the pillars of our medium- to long-term strategy. Given the anticipated demand for capital to fuel such vigorous growth, we're committed to consistently enhancing our profitability. This will drive a cycle from investment to growth and on to further investment.

In a rapidly changing market environment, merely investing does not guarantee growth. We believe that the power of imaginative innovation is vital to ensure that our business, including our investments, continuously creates. Simply supplying energy is not our only social responsibility. We must also offer new options to society and drive its sustainability, which in turn leads to our own sustainability.

Diversity in the workforce is at the heart of imaginative innovation, which is why we must continue to be a company that attracts and retains top talent. Of course, there are still challenges in creating the magnetic pull that attracts people and our ability to share our vision. For our employees, it's not about buzzwords like work-style reform, which you hear a lot in Japan. We must pivot toward a paradigm that aligns with genuine employee well-being and happiness. When I say talent, I'm not only referring to our employees. We are dedicated to delivering more compelling messaging to every one of our stakeholders—our customers, our financial backers, and our business partners.



The Harmony of A Strong Sense of Social Responsibility & Imaginative Innovation: The Energy Crafting JERA's Melody

As I've mentioned, a profoundly strong sense of social responsibility lies at our core. Given this mantle of responsibility, my mission is to harness the power of imaginative innovation to offer new value to society. At the same time, I must remain committed to driving our company's growth, regardless of the prevailing circumstances. I would also like to touch on one of the foundational tenets that we cherish at JERA: robust on-site capabilities that combine world-class safety, disaster prevention, and resilience.

While the importance of everyday safety is unquestionable, our unique position requires us to maintain operations even during typhoons and other emergencies, ensuring safety throughout. Yet unexpected complications often arise during crises. Nurturing

the power of imaginative innovation on a regular basis becomes pivotal in ensuring safety and responding flexibly amidst these challenges. The power of imaginative innovation is also the key to realizing robust on-site capabilities.

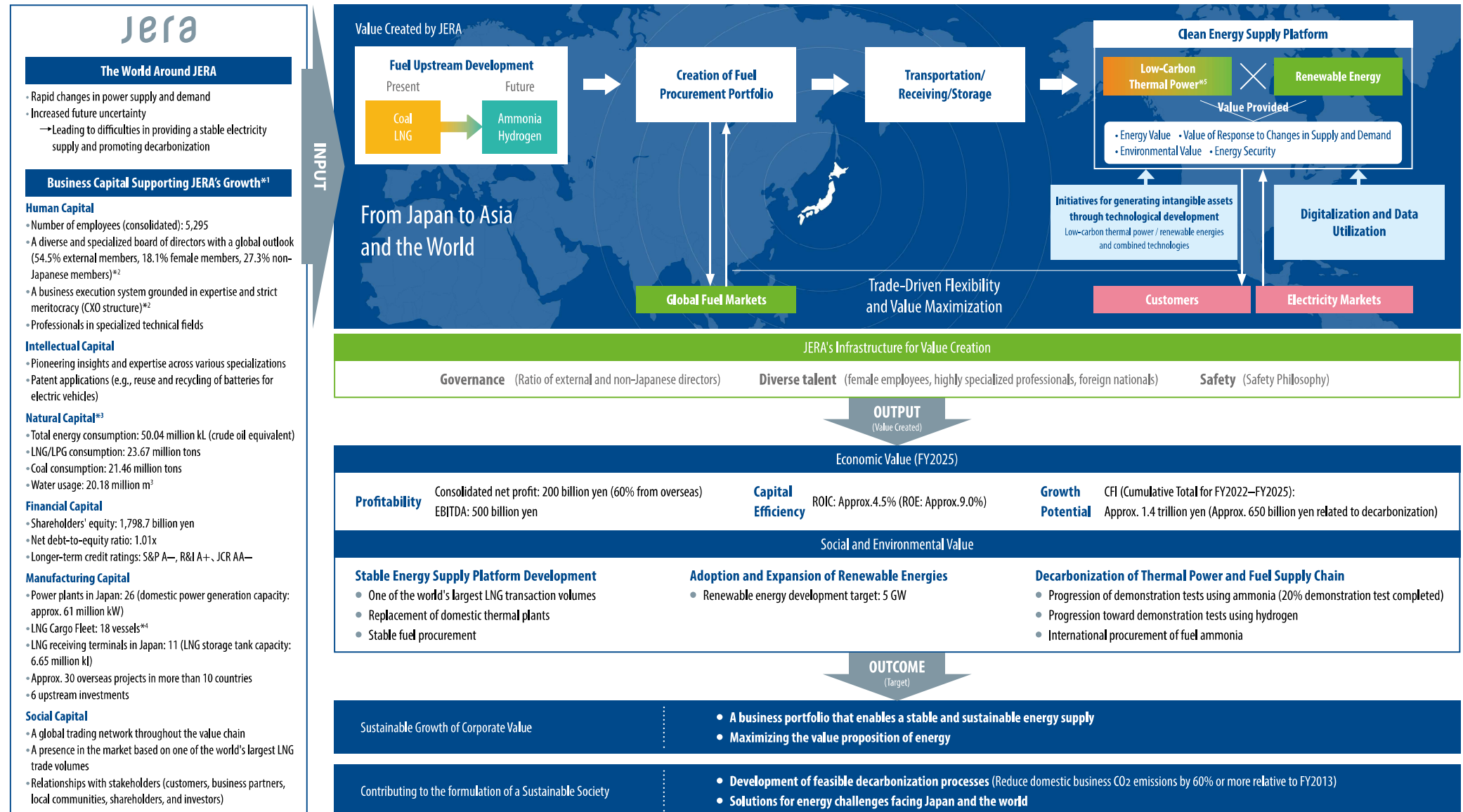
I am convinced that by combining a strong sense of social responsibility and the power of imaginative innovation, JERA can transcend the confines of an energy provider and evolve into something far more exhilarating. Only in a culture that fosters innovation on a daily basis can our employees thrive and find excitement in growing together with their roles, spurring a virtuous cycle of value creation.

As stated in the *Analects of Confucius*, "They who know the truth are not equal to those who love it, and they who love it are not equal to those who delight in it." I firmly believe in finding joy in one's work and have practiced this throughout my life. In this once-in-a-century opportunity to reshape the energy industry, I hope our employees will find pleasure in tackling the issues with fresh ideas and grow as individuals.

As President, Director, CEO and COO, I am committed to delivering even more for our stakeholders. We ask that you continue to support us in our endeavors.



Value Creation Process



*1 As of March 31, 2023 *2 As of July 1, 2023 *3 Results for FY2022 *4 As of September 2023 *5 Thermal power generation facilities assuming the use of zero-emission fuels such as hydrogen and ammonia

Context

Medium and Long-Term Strategy

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Understanding the External Environment

The Increasing Importance of Energy Security

Mounting Challenges in Energy Resource

Procurement

The energy landscape has undergone dramatic upheaval in recent years as reliable energy resource procurement has taken on greater importance to ensure a stable energy supply in times of peace and those of strife.

Europe had been dependent on Russia for natural gas and other energy resources but has been hurrying to secure alternative energy sources, including coal, since Russia's invasion of Ukraine in February 2022. This has resulted in a temporary global spike in natural gas and coal prices, making economical and flexible procurement even more challenging than before. As Japan also relies heavily on foreign energy sources, the unstable international situation represents a significant risk to reliable energy procurement for the country.

Furthermore, while more economically challenged nations in Asia will see increasing demand for electric power as their economies and populations grow, the sharp rise in resource prices will present a challenge as they work to secure their energy supplies.

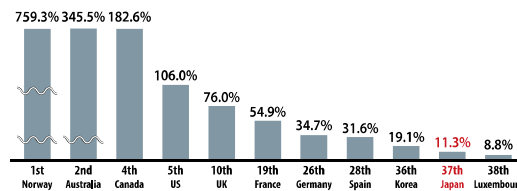
In Pursuit of Stable Electricity Supply

Expanded efforts to introduce renewable energy can be expected when examined from the perspective of improving upon energy self-sufficiency. However, while Europe has abundant renewable energy sources—most notably wind power—as well as an extensive power grid connecting the continent and a high degree of connectedness between countries, Japan and other countries in the Asia-Pacific region face limitations in terms of sunlight and wind conditions, as well as coverage and connectivity issues in the regional power grid.

Nuclear power plants have not returned to operation since the Great East Japan Earthquake, and the offshore earthquake near Fukushima in March 2022 damaged thermal power plants along the Pacific coast. As a result, Japan is now facing an energy crunch.

Within the S+3E framework (Safety + Energy Security, Economic Efficiency, and Environmental Compatibility) that forms the core of Japan's energy policy, pressing issues include stable energy resource procurement for ensuring secure electricity supplies, as well as the creation of the requisite power supply facilities.

Comparison of Primary Energy Self-sufficiency Rates of Major Countries (2020)



Source: Prepared based on "Japan's Energy: 10 Questions for Understanding the Current Energy Situation, in FY2022 version," Agency for Natural Resources and Energy website (https://www.data.jma.go.jp/cpdinfo/temp/1st/an_wkt.html) (Japanese)

*Prepared based on the following reference materials:

- "Energy White Paper 2023," Agency for Natural Resources and Energy
- "International Strategy to Achieve Carbon Neutrality, Document 3," METI Industrial Science and Technology Policy and Environment Bureau, Agency for Natural Resources and Energy: The 4th Joint Meeting of the Subcommittee for the Promotion of Green Transformation, Industrial Technology and Environment Subcommittee of the Industrial Structure Council, and the Subcommittee for the Study of Next Generation Energy Supply and Demand Structure for Carbon Neutrality in 2050, Basic Policy Subcommittee of the Advisory Committee on Natural Resources and Energy (https://www.meti.go.jp/shingikai/sankoshin/sangyo_gijutsu/green_transformation/004.html) (Japanese)

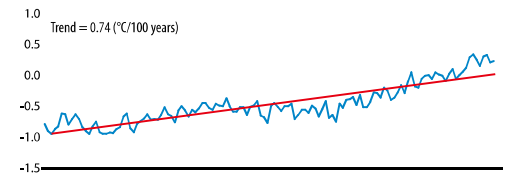
Developments Toward Accelerating Decarbonization

The State of Global Warming

The IPCC Sixth Assessment Report, released in August 2021, stated for the first time that it is beyond doubt that not only is global warming occurring, but that it is being caused by human influence.

The report further states that the global average temperature relative to pre-industrial levels is on track to increase by 1.5°C by 2040, and unless greenhouse gas emissions are significantly reduced in the next few decades, it will exceed 2°C within the 21st century. Additionally, it reported that as global warming continues to progress, the frequency and intensity of extreme weather events will increase, indicating that for every 0.5°C rise in global warming, there will be a marked increase in the severity and frequency of extreme temperatures (including heat waves), heavy rainfall, and drought in some regions. The world has already seen climbing average temperatures, melting snow and ice, torrential rains, and rising sea levels. In 2022, many parts of Europe experienced record-high temperatures, while Hurricane Ian cost North America 112.9 billion US dollars in economic damage. Japan is no exception, with notable events like the 2020 Kyushu floods and large typhoons, including Typhoon No.14 in 2022.

Annual Global Average Temperature Anomalies (deviation from 1991–2020 average)



Source: Prepared based on "Annual Anomalies of Global Average Surface Temperature," Japan Meteorological Agency. (Japanese)

The Essential Commitment to Decarbonization

The movement toward becoming a decarbonized society is accelerating on a global scale. At the 2015 Paris Climate Conference (COP21), the Paris Agreement was adopted as an international framework for reducing greenhouse gas emissions after 2020, including setting climate goals of 2°C and 1.5°C. Investment and legislation for achieving a decarbonized society continue to progress at the national level, particularly in Europe and the US. Moreover, with the increasing demand for energy, primarily in Asia, the push to move away from coal and toward renewable energy and gas transition is gaining traction. In October 2021, Japan also set a target to reduce greenhouse gas emissions by 46% by FY 2030 compared to the FY 2013 levels. In light of this movement away from carbon, a commitment to decarbonization has become essential for businesses operating on a global scale.

*Prepared based on the following reference materials:

- Provisional translation of the Summary for Policy Makers of the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report Working Group 1, Ministry of Education, Culture, Sports, Science and Technology / Japan Meteorological Agency. (Japanese)
- "Annual Report on the Environment, the Sound Material-Cycle Society and Biodiversity in Japan 2023," Ministry of the Environment. (Japanese)
- "Framework from 2020: Paris Agreement," Ministry of Foreign Affairs website (https://www.mofa.go.jp/ic/ch/page1we_000102.html)

Mid- to Long-Term Strategy Overview

Essential Mid- to Long-Term Strategies for Achieving Our Mission and Vision

Since the Russian invasion of Ukraine, global energy flows have been reshaped, and energy security has taken on greater importance. However, the need to address climate change remains as pressing as ever. Both stable supply and decarbonization must be addressed simultaneously and without delay.

We believe that renewable energies are being introduced to the maximum degree and that LNG will continue to play a key role as a transitional energy source to supplement any shortcomings encountered during the process.

We pledge our support for the spread of renewable energy while ensuring stable supply with the world's largest and most innovative LNG value chains.

Furthermore, technological innovation will also be indispensable for achieving zero emissions, as current technologies struggle to realize this goal. We will increasingly focus on technological innovation in areas including the decarbonization of thermal power generation and the digital transformation of business.

Each country and region will require its own unique solutions, even when facing similar energy challenges. We are committed to contributing to sound growth and development of the world by offering diverse solutions and building close relationships with customers and business partners across all regions.



Junya Tawa
Senior Managing Executive Officer
Chief Strategy Officer (CSO)



To provide cutting edge solutions
to the world's energy issues

Target
2035



Reduce CO₂
emissions by at
least 60%

Target
2050



Achieve virtually
zero CO₂ emissions
from JERA
operations

Target
2030



Reduce CO₂
emissions intensity
by 20%

Contributing to sound growth
and development of the world

2019 2022 2023 2025

Financial strategy and new management targets announced (2022)

Business integration completed and business plan announced (2019)

JERA's Current Position

Acceleration of Decarbonization

Stable Supply as the Basis

Balancing
decarbonization and
stable supply via zero-
emissions thermal power

Clean energy supply
platform that leverages
zero-emissions thermal
power, renewable
energy, and DX

In 2019, we concluded our business integration and formulated our business plans. Three years later, in 2022, we announced our financial strategy and new management goals to reflect changes in the business environment. We are committed to making steady progress toward achieving these plans.

		FY2022 Actual Results		FY2025 Target	
Financial Strategy and Management Goals (2022)	Net profit (excluding time lag)		200.3 billion yen		200 billion yen
	EBITDA		574 billion yen		500 billion yen
	ROIC		4.4%		Roughly 4.5%
	Credit rating		A rating		A rating
Business Plan (2019)	Net debt-to-equity ratio		1.01		1.0x or lower
	Renewable energy development output (cumulative)		2.5 GW		5 GW
	Synergies (initial FY2023 target: 100 billion yen)		120 billion yen		—
Roadmap to zero-emissions thermal power		2020s	2030s	2040s	
	Ammonia	Full-scale operation at a conversion rate of 20%	Full-scale operation at a conversion rate of 50%	Transition to single-fuel combustion	
	Hydrogen	30% of demonstration tests completed	Full-scale operation	Conversion rate increase	



To scale up its clean energy platform of renewables and low greenhouse gas thermal power, sparking sustainable development in Asia and around the world.

JERA Zero CO₂ Emissions 2050

Committed to Achieving Zero CO₂ Emissions across Domestic and Overseas Operations

JERA Zero CO₂ Emissions 2050

- ▶ JERA's mission is to provide cutting edge solutions to the world's energy issues.
- ▶ We are taking on the challenge of achieving net-zero CO₂ emissions in Japan and around the world in hopes of creating a more sustainable society for us all.

* JERA Zero CO₂ Emissions 2050 is premised on steady advances in decarbonization technology, economic viability, and consistency with government policy. We are developing its own decarbonization technologies and taking the initiative to ensure economic viability.

Three Approaches of JERA Zero CO₂ Emissions 2050

1

Combining Complementarity Renewable Energy with Zero-CO₂ Emission Thermal Power

We will achieve its vision through a combination of renewable energy and zero CO₂ emission thermal power generation. The adoption of renewable energy is supported by thermal power capable of generating electricity regardless of natural conditions. JERA will promote the adoption of greener fuels and pursue thermal power that does not emit CO₂ during power generation.

2

Establishment of Country and Region-Specific Roadmaps

We will achieve zero CO₂ emissions by establishing roadmaps that chart optimal solutions for each country and region. Since the energy situation varies by country and region, with different solutions available based on the feasibility of renewable energy options and the presence of pipelines and transmission lines, we will work with stakeholders to establish country and region-specific roadmaps. We have already developed a roadmap for our business in Japan, which we will extend to other countries and regions.

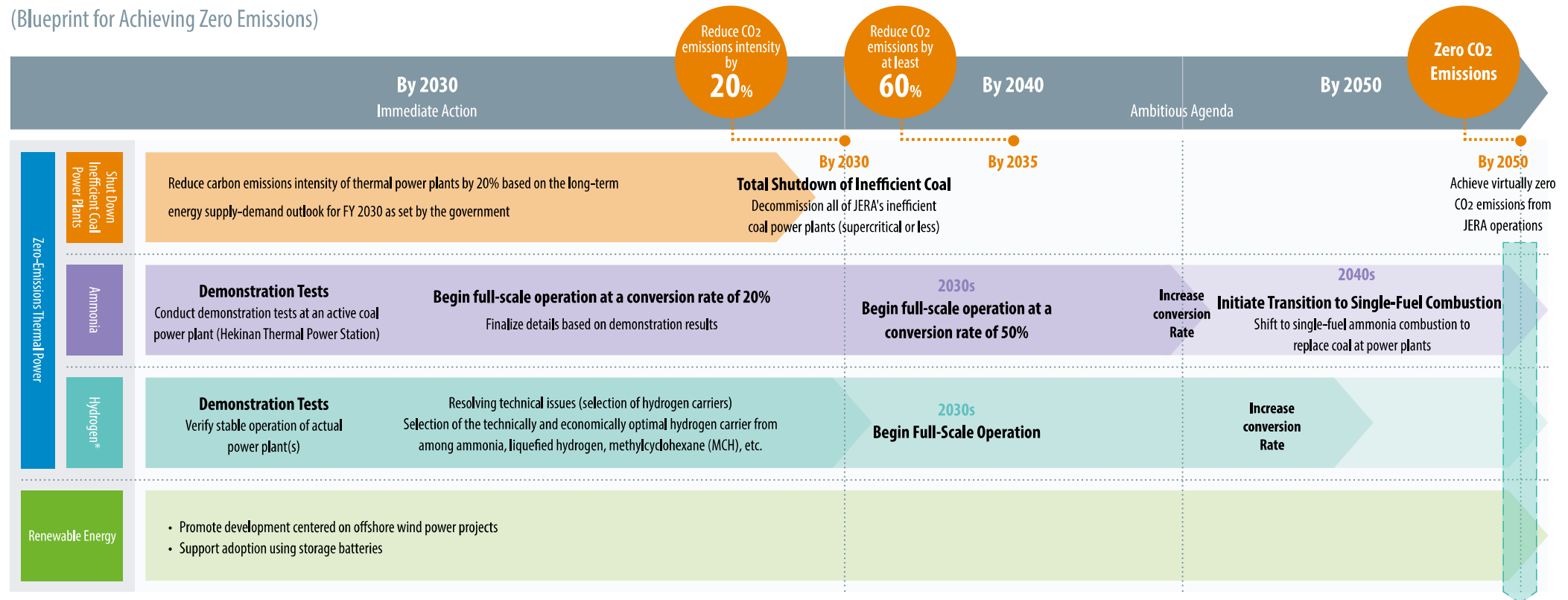
3

Ensuring Smart Transitions

We will achieve zero CO₂ emissions through our smart transition strategy, which combines innovative and viable technologies available when adoption decisions are made. This approach will lower technical risk and facilitate a transition to a green society.

JERA Zero CO₂ Emissions 2050 Roadmap for Its Business in Japan

(Blueprint for Achieving Zero Emissions)



This roadmap will evolve incrementally, adapting to changes in government policy and other relevant conditions, and will be revised as needed.

*We are also considering the use of CO₂-free LNG.

By 2050, CO₂ emissions from power plants still using fossil fuels will be offset using technologies like CO₂-free LNG

JERA Environmental Target 2030

JERA is actively working to reduce CO₂ emissions. For domestic operations, we will achieve the following by FY2030:

- Decommission all inefficient coal power plants (supercritical or less) and conduct demonstration tests of conversion to ammonia at high-efficiency (ultra-supercritical) coal power plants.
- Promote the development of renewable energy centered on offshore wind power projects and work to further improve the efficiency of LNG thermal power generation.
- Reduce carbon emissions intensity of thermal power plants by 20% based on the long-term energy supply-demand outlook for FY 2030 as set by the government.

JERA Environmental Target 2035

JERA aims to reduce CO₂ emissions from domestic operations relative to FY2013 by at least 60% by FY2035 through the following initiatives:

- Strive to develop and adopt renewable energy in Japan, given expanded adoption under the national government's 2050 carbon-neutral policy.
- Commit to reducing carbon emissions intensity from thermal power generation by promoting hydrogen and ammonia conversion.

"JERA Zero CO₂ Emissions 2050 for Its Business in Japan" and the "JERA Environmental Targets" are premised on steady advances in decarbonization technology, economic rationality, policy consistency, and the business climate under which these goals will be realized.

These targets have been formulated in alignment with Japan's greenhouse gas reduction goals and long-term strategy, both of which were established with an eye towards realizing the global ambition set forth in the Paris Agreement—that of limiting the global average temperature increase to as close to 1.5°C above pre-industrial levels as possible.

Zero-Emissions Thermal Power

Plan for Ammonia and Hydrogen Introduction

In FY2023, we plan to start demonstration tests in which we convert 20% of the existing fuel mix to ammonia at Hekinan Thermal Power Station Unit 4. We will increase the ammonia component to at least 50% by FY2028 and conduct more demonstration tests with the aim of making high-ammonia mixes (50%+) commercially viable in the early 2030s. Converting 20% of the fuel in a 1 million kW coal-fired power plant with ammonia will reduce annual CO₂ emissions by approximately 1 million tons (calculated based on the Central Research Institute of Electric Power Industry's "Comprehensive Assessment of Life Cycle CO₂ Emissions from Power Generation Technologies in Japan").

We also plan to conduct demonstration tests in which we convert (by volume) 30% of the existing fuel mix to hydrogen at our gas turbine-type LNG-fired thermal power plants in the 2020s to make hydrogen mix commercially viable in the mid-2030s.

Message from Outside Expert



Takeo Kikkawa
President, International
University of Japan

Pioneering Zero-Emissions Thermal Power to Save the Planet

Renewable energy, mainly solar and wind, will play a prominent role in making carbon neutrality a reality. Such variable power sources rely on—and are at the mercy of—the sun and the wind, necessitating some form of backup mechanism. Initially, battery storage is expected to fulfill that backup role; however, this would come with the caveat of heavy reliance on China for raw material procurement. Consequently, thermal power generation must serve as a backup, even though employing conventional power plants that release carbon dioxide would be contrary to our goals of achieving carbon neutrality. This underscores the need for zero-emissions thermal power, which utilizes ammonia or hydrogen as fuel without emitting carbon dioxide. In other words, it is essential to have renewable energy and zero-emissions thermal power work in tandem to achieve carbon neutrality.

JERA is the global leader pioneering the transition to zero-emissions thermal power. With the breakthroughs in ammonia demonstration testing at Hekinan Thermal Power Station, JERA is embarking on a grand challenge to save our planet.

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Progress of Ammonia Demonstration Tests at Hekinan Thermal Power Station

Since FY2021, we have been collaborating with IHI Corporation to initiate actual demonstration tests* at Hekinan Thermal Power Station Unit 4 (Hekinan City, Aichi Prefecture, Japan).

For these tests, a receiving facility will be installed at the coal unloading berth, and liquid ammonia unloaded from an ammonia transport will be transported via a pipeline to an ammonia tank. From there, the liquid ammonia will be regasified for combustion in the ammonia burners installed at Unit 4. To date (as of August 2023), the installation of such ammonia facilities as ammonia burners, tanks, and regasifiers has progressed as planned.

The power plant has been using ammonia to remove NO_x from exhaust gas since commencing operations. As ammonia is also used in large quantities as fuel, we will implement adequate safety measures and seek understanding from the local residents as we proceed.

* Implemented under "Development of Technologies for Carbon Recycling and Next-Generation Thermal Power Generation / Research, Development and Demonstration of Technologies for Ammonia Converting Thermal Power Generation" subsidized by the New Energy and Industrial Technology Development Organization (NEDO)
NEDO is a national research and development agency.



Kenji Takahashi
General Manager,
Decarbonization Promotion
Section, Planning Division



Construction Progressing on Ammonia Demonstration Test Facility at Hekinan Thermal Power Station

Zero-Emissions Thermal Power

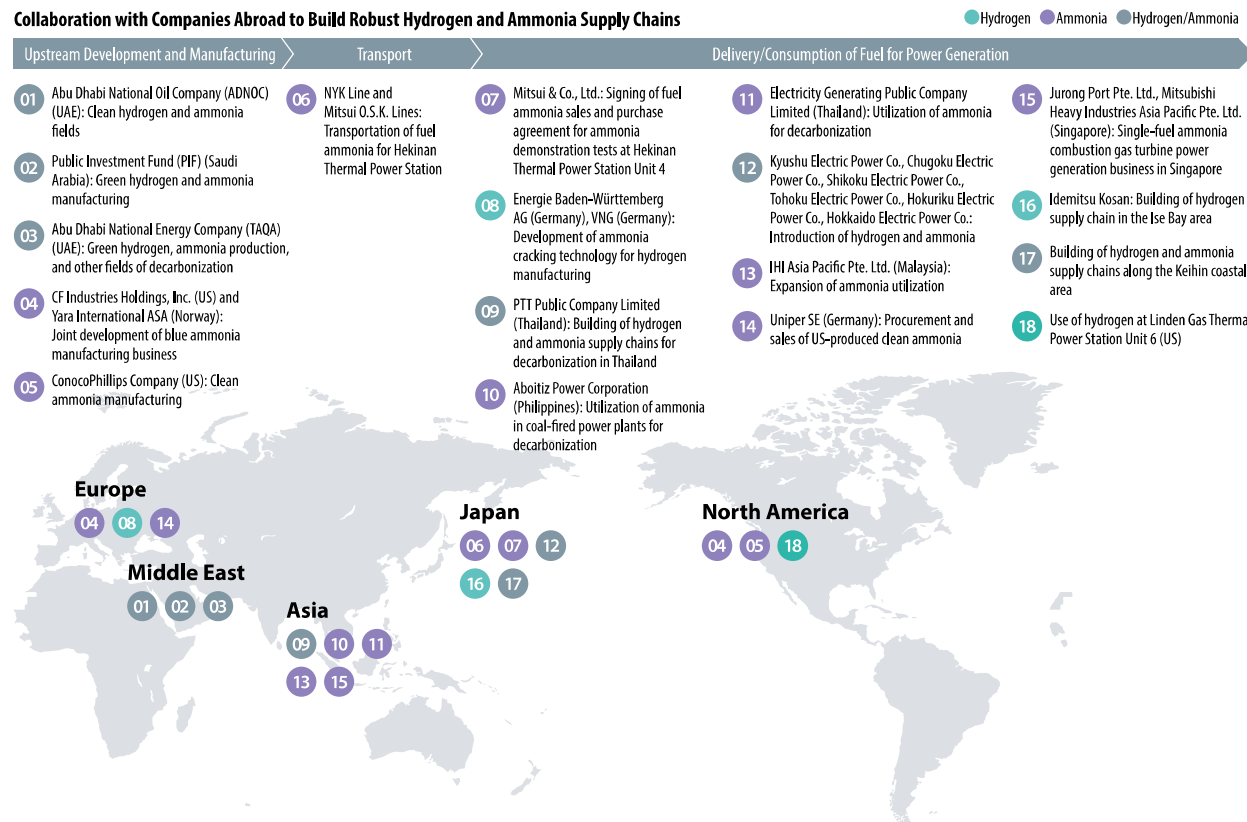
Promoting and Expanding Green Fuels by Leveraging the Strengths of the Full LNG Value Chain

Building robust supply chains is essential to promote clean hydrogen and ammonia usage. In collaboration with leading corporate partners in Japan and overseas, we are steadily advancing initiatives for tangible clean hydrogen and ammonia development, as well as technology innovation projects, leveraging expertise from the successful establishment of a solid revenue base and experience with LNG value chain spanning upstream fuel development, transportation, storage, power generation, and sales.

In Asia, where zero emission is a common goal, we are using our knowledge and technology to establish a decarbonization roadmap with key partners in each country and are exploring solutions that take characteristics into account specific to each region and country, including the use of hydrogen and ammonia.

Our commitment to resolving global decarbonization and energy issues is demonstrated through our development of hydrogen and ammonia supply chains both in Japan and globally and through our ambitious expansion into business areas that envision the sale of green fuel for applications beyond power generation.

Collaboration with Companies Abroad to Build Robust Hydrogen and Ammonia Supply Chains



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Hydrogen Power Generation Initiatives

We are promoting hydrogen power generation initiatives in Japan and abroad. In Japan, we are utilizing NEDO's Green Innovation Fund Projects to explore demonstration tests for hydrogen power generation. At our thermal power plants, we aim to convert (by volume) 30% of LNG fuel to hydrogen and evaluate factors such as operational and environmental characteristics. We have been conducting business feasibility studies since FY2021, and based on the results, we plan to proceed with practical demonstration tests. Overseas, we have finished modifying the gas turbine for hydrogen use at Linden Gas Thermal Power Station Unit 6 in the US (fuel: natural gas), in which we have invested through our US subsidiary. The plant is now capable of mixed combustion with up to 40% hydrogen (by volume), using hydrogen supplied from an adjacent oil refinery.

Since the use of hydrogen power generation in Japan requires the development of hydrogen carrier technology for economically rational hydrogen pricing and marine transportation, we are working on developing new catalysts for high-efficiency, low-cost hydrocracking of ammonia, a hydrogen carrier that can be transported and stored at low cost.*

We will continue our efforts to resolve the challenges surrounding the use of hydrogen energy. Furthermore, by promoting the earlier use of hydrogen where it is readily available, we aspire to accumulate technological capability and experience deployable across our domestic and overseas power generation businesses.

*Implemented under NEDO's "Development of Technologies for Building a Competitive Hydrogen Supply Chain"



Hydrogen Power-enabled Linden Gas Thermal Power Station Unit 6 (US)

Renewable Energy Business

Our renewable energy business has played a pivotal role in the JERA Zero CO₂ Emissions 2050 initiative, and we have strategically enhanced our offerings to include offshore wind, onshore wind, solar, and battery storage projects on a global scale. Moving forward, we aim to establish a global system that efficiently leverages the insights and technologies we have consolidated within our European renewable energy organization for projects in various regions. And we are committed to further expanding this renewable energy business by capitalizing on our strength in providing multifaceted options such as LNG, hydrogen, and ammonia.

Strengthening Our Renewable Energy Initiatives

Until now, our renewable energy business was a collaborative effort between the JERA headquarters and our development teams across various regions, but there were challenges to coordination between regions. In some cases, knowledge and talent within the JERA Group were dispersed across the globe, which meant there were instances when we could not capitalize on potential synergies.

To further accelerate our renewable energy business, we have established a global system by forming a group of professionals stationed at our renewable energy hub in Europe, which will be responsible for project development, construction, and operations. This structure will allow us to leverage global insights and talent across local project development across different regions. Specifically, we have already begun to consolidate our renewable energy business under the umbrella of our UK company, JERA Green, bringing together Parkwind and Green Power Investment (hereinafter "GPI"), which were acquired in 2023. Additionally, we will promote the commercialization of a development pipeline exceeding 10 GW by integrating existing renewable energy projects in Japan and overseas with a global team of 300 specialized professionals.

This structure will strengthen cooperation among our offices in regions around the world, allowing us to efficiently utilize valuable management resources that were previously scattered within our group. Moreover, it promises the potential for synergy among different technologies and businesses, such as offshore and onshore wind, solar, and battery storage, which will balance the adoption and deployment of global renewable energy standards with local perspectives in legislative frameworks, supply chain formation, and community coexistence strategies.

Moving forward, we are committed to further expanding our renewable energy business on both domestic and international fronts. By strengthening collaboration with our other businesses in LNG, hydrogen, and ammonia, we aim to enhance the competitiveness of our renewable energy business. JERA stands unique in its capability to offer multifaceted options and is well poised to elevate its position in the competitive landscape of renewable energy.

Structure of Future Initiatives

Consolidating our renewable energy business under a specialized organization and establishing a global framework



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Acquisition of Major Renewable Energy Companies in Europe and Japan

As a key move toward establishing a global system, we acquired Parkwind, a leading offshore wind power operator in Belgium, in July 2023. Not only does Parkwind have a culture that closely aligns with ours, but the company also boasts a proven track record in Europe, the global leader in offshore wind power. We plan to leverage their diverse talent and advanced expertise in our strategic regions, starting with Japan.

Furthermore, in August 2023, in partnership with NTT Anode Energy Corporation, we acquired Green Power Investment Corporation (GPI), a renewable energy operator in Japan. This acquisition aims to strengthen our business development in our home market of Japan. In particular, since many domestic offshore wind projects are slated to commence operations around 2030, involvement in GPI's projects allows us to accumulate experience that we believe will be significantly beneficial for our future domestic projects.



Courtesy of GPI

Message from the Parkwind Co-CEOs



Eric Antoons
François Van Leeuw
Parkwind Co-CEOs

We strongly believe that the new partnership between JERA and Parkwind comes at a pivotal moment for our renewable energy business, and we couldn't be more excited about the opportunities it brings. Together, we commit to driving innovation and sustainability forward. It became clear during our first conversations with the JERA teams that our shared vision aligns perfectly, and we are excited about the expertise and fresh perspective you bring. By combining JERA and Parkwind's exceptional resources, knowledge, and experience, we anticipate significant growth and success. We look forward to open communication and fruitful cooperation on this remarkable journey. Through our partnership, we will create a greener, more sustainable world for generations to come.

Renewable Energy Business

Message from the Managing Executive Officer



Nathalie Oosterlinck
Managing Executive Officer
Head of the Global Renewable Energy Division

As part of our renewables strategy, we have completed two large M&A (mergers and acquisitions) deals in 2023 to assemble a strong and capable offshore wind team. Going forward, we will work to leverage this talent and experience to strengthen our onshore renewable energy sector and create synergies between the two. In addition, we will further enhance the competitiveness of our renewable energy business by leveraging the strengths of our full value chain and combining them with our other businesses, such as LNG, hydrogen, and ammonia.

Moreover, we are committed to further enhancing the competitiveness of our renewable energy business by leveraging the strength of our full value chain and integrating it with our other businesses, such as LNG, hydrogen, and ammonia.

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Initiatives in Taiwan

We are focused on accumulating insights in Taiwan, a pioneer in offshore wind power in Asia. In doing so, we aim to extend our operations to other regions, such as Japan, which share similar weather and marine conditions. In 2019, we participated in the Formosa 1 project, Asia's first large-scale offshore wind project, and subsequently took the lead as the largest shareholder in Formosa 2 from its initial construction phase.

During the construction of Formosa 2, we navigated unique challenges as a Japanese company, which included project delays and escalating costs due to the COVID-19 pandemic, but we were able to hold a completion ceremony in May 2023, attended by Taiwan's President Tsai Ing-wen (pictured below). The valuable experience and knowledge gained from both projects will be utilized for future business endeavors.



Courtesy of Formosa 2 Wind Power Co., Ltd. (Unauthorized use prohibited)

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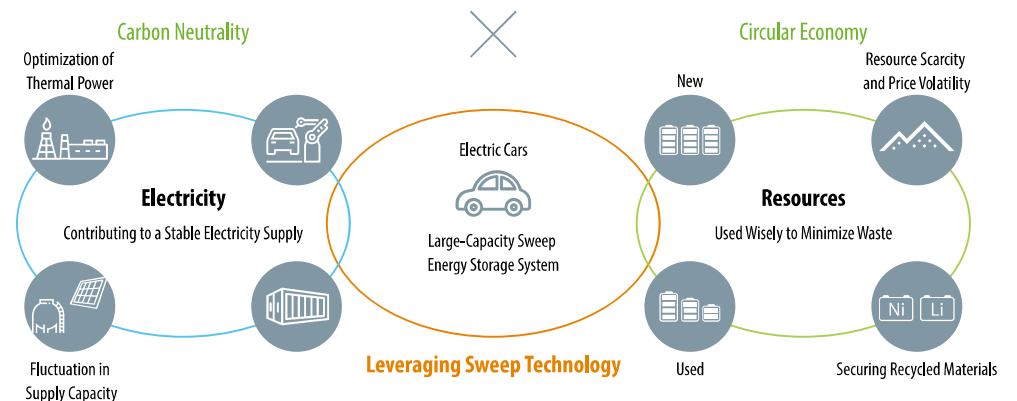
Intellectual Property for Zero Emission: Large-Capacity Sweep Energy Storage System

As we see more renewable energy sources introduced to reduce CO₂ emissions and achieve carbon neutrality, battery storage is expected to experience a rise in demand as a stabilizer in energy supply and demand. Furthermore, given the limited reserves of resources such as cobalt and lithium, which are required for manufacturing storage batteries, it is essential to promote environmentally friendly practices, such as putting reclaimed electric car batteries to good use. In light of such conditions, since 2018, together with Toyota Motor Corporation, we have continuously investigated establishing technologies for battery reuse, resulting in the development of a large-capacity sweep storage system (pending national and international patents) that can fully utilize the capacity of a mixed array of batteries, regardless of their level of degradation. Moreover, we possess a high-voltage pulse technology (pending domestic and international patents) as a low-environmental-impact recycling technique for batteries, enabling us to achieve a reduction in CO₂ emissions associated with battery use throughout its lifecycle.

We are committed to contributing to the circular economy and taking on challenges to address new social issues using the intellectual property generated in our efforts toward carbon neutrality.



Large-capacity sweep energy storage system that uses electric car batteries



Message from the CFO

Kazuo Sakairi
Corporate Vice President,
Managing Executive Officer, Director,
and Chief Financial Officer (CFO)

My Commitment to Enhancing Corporate Value as CFO

Significant shifts are taking place in the electric power industry that is changing the business landscape around JERA. The manifestation of geopolitical risks has brought to the fore the vital importance of ensuring a stable electricity supply, and there has also been a rising sense of crisis regarding climate change as abnormal weather events occur around the world, accelerating a global movement toward decarbonization. Given these dynamics, along with the importance of fulfilling our mission and vision, FY2022 made us acutely aware that navigating a course for the company has grown increasingly difficult from year to year. I would therefore like to raise two points that I think will help in making good decisions on management issues under these circumstances.

The first is that the scope of responsibilities of the CFO is expanding and diversifying as our operations continue to grow around the world.

Prior to joining JERA as CFO in April 2019, I served as an advisor to financial institutions and an independent M&A advisory firm, working on the establishment of governance structures and decision-making processes in M&A and integration, not only for Japanese businesses but also for foreign companies. Throughout my career, I've come to understand that the CFO of a global company should be more than just an expert in finance and accounting. They must also act as a strategic aide to the CEO or even as a representative, engaging with stakeholders both inside and outside the company to enhance its corporate value.

Since its establishment, we have aimed to become a global company rooted in Japan that can compete on an even footing with the world's leading energy companies. In the four years or so since I joined JERA, we have accelerated efforts to realize this global strategy, investing in Asian companies, upstream assets overseas, and startups on the west coast of the United States and in Germany; we have also acquired a large European renewable energy company. In Singapore, we own a two-thirds stake in one of the world's largest trading companies, which specializes in asset-backed trading, through a joint venture with EDF Trading, a subsidiary of the prominent French electricity company EDF. This is part of our commitment to ensuring a stable electricity supply for Japan. Furthermore, we have established a skills matrix for essential management personnel. Aligned with this, we have recruited numerous professionals from diverse sectors and fields internationally to fill positions—including as outside directors, executive officers, and senior executives. Through this process, it has become clear that the role of CFO at JERA covers a broader spectrum of responsibilities in the context of being a global company. I am deeply attuned to this evolving CFO role and committed to spearheading our company's value enhancement.

The second point is in regard to the need to strengthen our human resources and organizational capabilities.

Enhancing corporate value and implementing the CFO's role, as I discussed earlier, are not things I can accomplish entirely on my own. To compete globally, it is essential that we assemble teams of personnel who bring vitality and diversity and are equipped with the necessary skills and experience. Moreover, I believe it is crucial to transform our organizational structure. We must eliminate the vertically divided way of working and foster a flat, open working environment where teams can freely collaborate and generate synergies to exceed their expectations.

Based on this belief, I have explicitly set a vision for Financial and Accounting where I call upon the nearly 160 talented individuals in the JERA

Message from the CFO

headquarters' Finance and Accounting to aspire to become professionals who can be held in high regard by the diverse stakeholders that surround us, both inside and outside the company. This ambition is clearly articulated in the department's two-fold mission: One, to communicate with internal and external stakeholders and provide financial and accounting intelligence to support management in making strategic decisions; and two, to play a role in corporate governance from the liability side (the right side of the balance sheet), contributing to the enhancement of corporate value. In more tangible terms, we aim to protect JERA against damage to corporate value and instead contribute to decisions that boost its value. We aim to do this through a sustainable management foundation, a management compass, and spokesperson proposals. We also emphasize to our personnel the value of relationships with colleagues internally and stakeholders externally. By actively listening to the information and feedback they offer and leveraging our financial and accounting expertise, we can maximize the potential of our people and the organization.

To maximize our potential in Finance and Accounting, it is essential to foster an organizational culture that values diversity and allows every person, from employees to corporate officers, to use their abilities to the fullest. In addition to transfers from the shareholder companies, the Finance and Accounting actively recruits professionals regardless of nationality or gender. As of July 1, 2023, mid-career hires account for about 60% of the nearly 160 members in the Finance and Accounting at JERA headquarters. Apart from personnel at headquarters, around 90 individuals handle finance and accounting roles abroad, predominantly at JERA Americas, JERA Australia, and the recently acquired Parkwind. This includes approximately 10 individuals who were dispatched from our headquarters. This initiative is part of our regular practice of sending mid-level and younger staff eager to embrace new challenges to our overseas sites, subsidiaries, and investees for the chance to gain a broad range of experience. Moreover, the gender ratio for the entire Finance and Accounting, combining headquarters and overseas sites, is just over 30% (just under 20% at



Personnel from JERA Americas' Finance and Accounting Department

headquarters). We will continue to actively recruit female employees for managerial roles and strive to increase the gender ratio, which currently stands at slightly over 20% (about 10% at the headquarters). Alongside these endeavors, we plan to establish several international project teams to function across borders, aiming to unite and integrate them as One Team.

As Global CFO, I place great importance on these two points, striving to propel growth and development for the JERA Group. At the same time, I aim for management that consistently takes into account the cost of capital to maximize corporate value.

Review of FY2022 and Progress on Management Targets

In April 2019, we set a target of 200 billion yen in consolidated net profit by FY2025 (excluding time lag), and in May 2022, we also established new management targets for profitability, capital efficiency, growth potential, and financial health with the aim of achieving disciplined growth and maximizing corporate value. While our progress toward these targets is on track overall, we will continue to pursue a range of initiatives and make every effort to meet these targets.

Consolidated Net Profit

In FY2022, gains emerged despite setbacks from the fire incident at the Freeport LNG terminal affecting LNG spot procurement and from recognizing estimated liabilities. The gains can be attributed to the expansion of JERA Global Markets' (JERAGM) transactions primarily in Europe amidst the unstable fuel market situation stemming from the Russia-Ukraine situation, securing a consolidated net profit of 200.3 billion yen (excluding time lag).

We view the profit boost from JERAGM as a temporary gain. Though we anticipate such transient gains to diminish starting FY2023, we remain committed to reaching our FY2025 target of a consolidated net profit of 200 billion yen.

Synergies

In line with the business plan we unveiled in April 2019, which called for the creation of synergies exceeding 100 billion yen annually within five years (by FY2025) following the integration of our existing thermal power generation and other businesses, we were able to generate 120 billion yen in synergies as of FY2022, one year ahead of our initial target. Four years have passed since the completion of the asset and business integration of our shareholder companies. We have now completed the post-merger integration (PMI) and have transitioned to the phase of implementing the management targets declared in 2022.

Balance Sheet Management

Total Assets

Our total assets have reached a high level due to the impact of the market value of unsettled balances in transactions, which, in

Message from the CFO

the context of JERAGM's fuel quantity adjustments, are recorded as derivative receivables and payables. Continued monitoring is warranted because subsequent changes in resource prices may cause the amount to fluctuate widely.

Interest-Bearing Liabilities and Net Assets

In FY2022, due to the effects of surging resource prices and the increased demand for operational capital resulting from spot procurement to ensure a stable electricity supply, we had to secure a large amount of financing to be used until our operating cash flow recovers. Besides primarily focusing on short-term loans and issuing corporate bonds, we also pursued diversified financing methods such as issuing transition loans and foreign currency-denominated corporate bonds. As a result, we believe we were able to enhance our future fundraising base and diversify our procurement markets.

On the other hand, while we had set a target of reducing net DER to 1.0 or less by 2025, interest-bearing debt increased to 3.5 trillion yen by the end of September 2022, causing the net DER to deteriorate to 1.66. Given the instability in the fuel market and the anticipated risk of prolongation, we issued hybrid corporate bonds worth 96.5 billion yen in December 2022 and secured a perpetual subordinated loan of 200 billion yen in March 2023 to improve our net DER. Subsequently, with conditions improving in the fuel market and operating cash flow on a recovery trajectory, our net DER improved to 1.01 as of March 31, 2023. Additionally, our ROIC, which represents capital efficiency, stood at 4.4% for FY2022, approaching our target for FY2025.



Personnel working in corporate finance to secure and diversify funding

	Performance indicators	FY2022	FY2025 target
Profitability	Net profit*	200.3 billion yen	200 billion yen
	EBITDA*	574 billion yen	500 billion yen
Capital efficiency	ROIC*	4.4%	Approx. 4.5%
	WACC	—	Approx. 3.5%
Growth potential	CFI	369.4 billion yen	Cumulative total for FY2022—2025: approx. 1,400 billion yen
Financial health	Net debt-to-equity ratio	1.01x	1.0x or lower
	Net debt-to-EBITDA ratio*	3.7 years	4.5 years or less

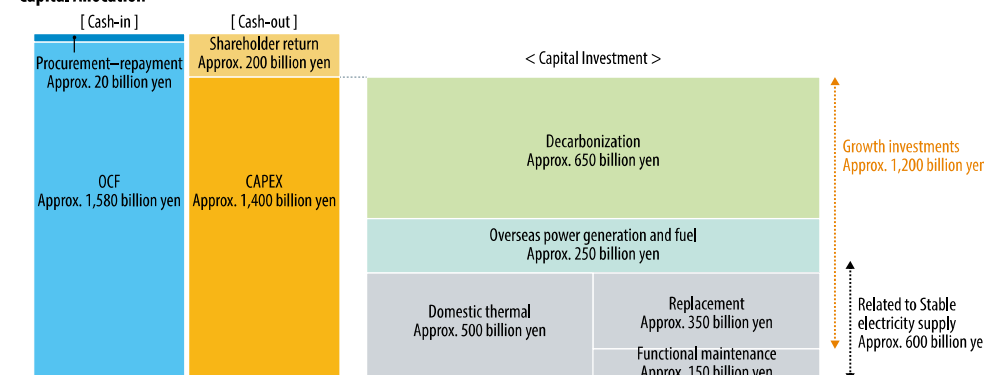
*Excluding time lags after fuel cost adjustments

Capital Allocation

In FY2022, the cash flow situation changed significantly between the first and second half of the year. In the first half of FY2022, operating cash flow deteriorated significantly due to an increase in the loss from the time lag caused by soaring resource prices and other factors, resulting in a negative free cash flow of approximately 900 billion yen. In the second half of FY2022, operating cash flow improved to about 450 billion yen for the full year due to better fuel market conditions, resulting in a final positive free cash flow of about 80 billion yen.

At the time of our strategy and target announcement in May 2022, we planned to actively allocate about 1.4 trillion yen to CAPEX over a total of four years from FY2022 to FY2025, with a cash flow of 1.6 trillion yen, primarily from operating cash flow. Most recently, we have been actively pursuing initiatives aimed at growth as well as decarbonization, including the acquisition of Parkwind, a leading offshore wind power generation company in Belgium, and the decision to invest in GPI, a renewable energy power generation company in Japan. We have a history of basing investments on the premise of maintaining a sound financial base, and we believe that the effective functioning of our financial strategy targets played a role in these investments. At present, we believe that both operating cash flow and CAPEX are generally in line with the plan announced in May 2022.

Capital Allocation



Toward the Realization of Medium- and Long-Term Strategies

The progress we are making toward reaching our targets is generally on track, though we must stay alert to changes in the business environment. We will announce our next growth targets when we are more certain of achieving them, but in line with our medium-to-long-term strategy, we intend to continuously invest for growth post-2025, mainly in the areas of renewable energy, hydrogen, and ammonia. Given the expected demand for capital to ensure robust growth, we will steadily increase our profitability and create a cycle that leads from investment to growth and then to further investment. We will continue to review our financial strategy for FY2025 and beyond, and as CFO, I will do everything I can to facilitate the steady strengthening of our financial base to support growth investments, aiming to further enhance corporate value.

Context

Business Initiatives

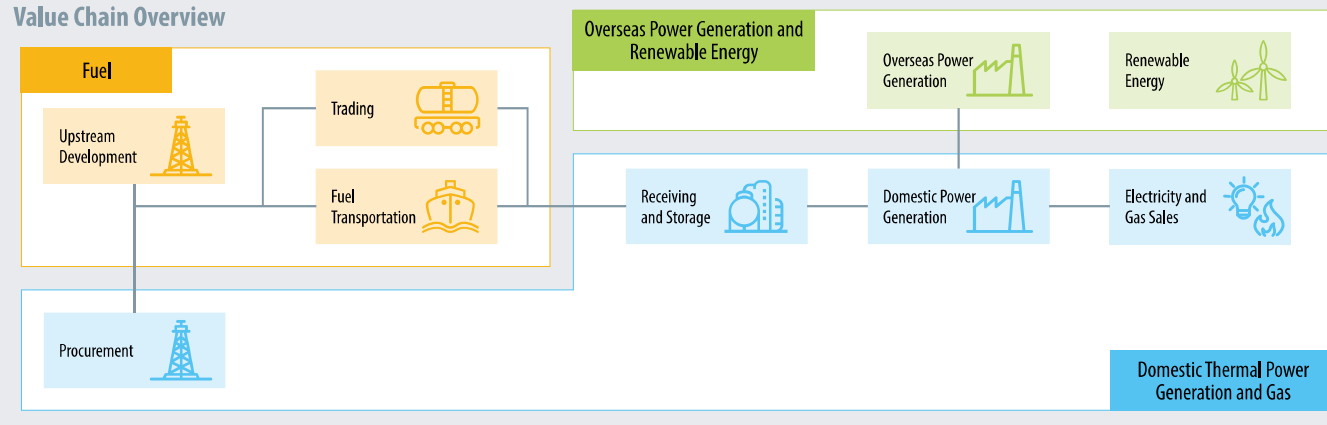
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The Business Capital Behind Our Value Chain and Growth

Our reporting segments are comprised of our Fuel Business, Overseas Power Generation and Renewable Energy Business, and Domestic thermal power generation and gas business. Our fuel business uses the market to optimize the production and transport of LNG—a primary fuel for thermal power generation—as well as the assets of the JERA Group (including LNG upstream operations and fuel procurement contracts for our domestic thermal power generation and gas business). Our Overseas Power Generation and Renewable Energy Business comprises our power generation ventures outside Japan as well as renewable energy development projects both domestically and internationally. 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 (development and construction), offering high-quality energy services while fulfilling its primary responsibility of ensuring a stable energy supply for the domestic market.

Value Chain Overview



The Business Capital Behind Our Growth

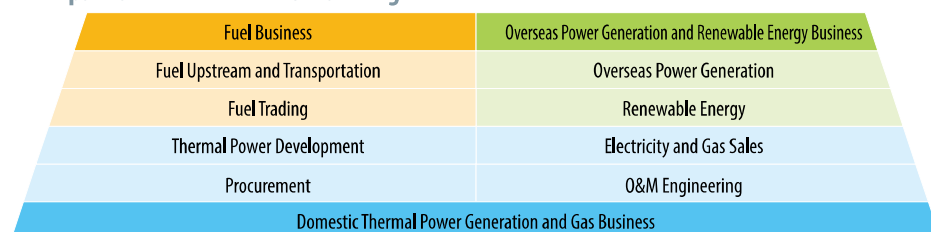
Manufacturing Capital	Social Capital
Financial Capital	Human Capital
Intellectual Capital	Natural Capital

*1 The number of employees excludes those on loan from the JERA Group to other companies but includes those on loan from other companies to the JERA Group.

*2 The total number of temporary employees is less than 1/10 of the total employee count, so it is not listed.

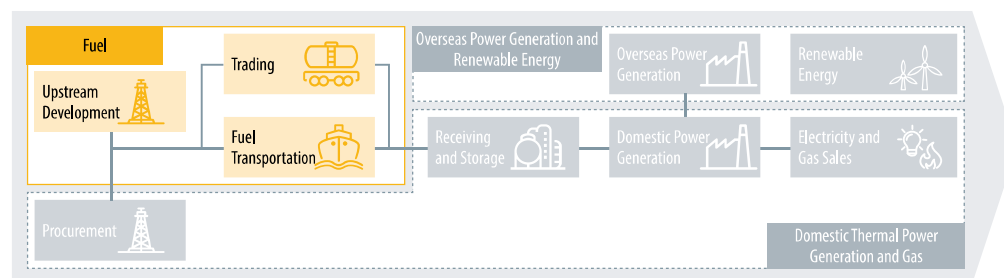
Fuel Business ▶ P.28	Overseas Power Generation and Renewable Energy Business ▶ P.31	Domestic Thermal Power Generation and Gas Business ▶ P.34
Manufacturing Capital Upstream Investments 6 LNG Cargo Fleet 18 Vessels (as of September 2023)	Manufacturing Capital Overseas Power Generation Capacity (output share) Approx. 1,240 MW Number of Overseas Projects Approx. 30 Overseas Business Locations 10+ Countries Development Output in Renewable Energy 2.5 GW	Manufacturing Capital Number of LNG terminals 11 Power Generation Capacity in Japan Approx. 6,100 MW LNG Storage Tank Capacity 6.65 million kL Power Plants in Japan 26
Human Capital Number of Employees*1,*2 420	Human Capital Number of Employees*1,*2 398	Human Capital Number of Employees*1,*2 3,610
Financial Capital Revenue 585.7 billion yen	Financial Capital Revenue 8.6 billion yen	Financial Capital Revenue 6,153.4 billion yen

Principal Business Activities of Each Segment



Positioning within the Value Chain

As the recent growth of renewable energy and other uncertain factors lead to increasing fluctuations in electricity demand, we have been minimizing these impacts by optimizing the entire value chain, from fuel procurement to electricity sales. Especially in our fuel business, we engage in upstream fuel projects to ensure a stable supply of competitive LNG and establish and optimally operate fleets for flexible LNG transportation. Moreover, by leveraging our global trading network, we provide supply flexibility to respond to demand fluctuations. Through these measures, we have achieved both enhanced supply stability and improved profitability.



Business Overview

Fuel Upstream and Transportation

We handle approximately 35 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 fuel supply. Additionally, in our LNG transportation business, we achieve flexible and competitive fuel transportation through the optimal configuration and efficient operation of our fleet. By leveraging our expertise in LNG and the world's largest off-take capacity, we aim to build a fuel value chain for hydrogen and ammonia as well, to achieve zero-emission thermal power generation, supply it to other industries, and expand our business globally.



Fuel Trading

Centered around JERA Global Markets (JERAGM), 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. Additionally, we harness financial methods to capitalize on the benefits from these transactions by real contracts, ensuring revenue opportunities at a relatively low risk.



Distinguishing Features

We have constructed a resilient portfolio by diversifying procurement regions and contract durations, as well as participating in upstream ventures, among other initiatives. To ensure a stable energy supply, we also utilize market intelligence centered around JERAGM, building a framework that can flexibly respond to fluctuations in demand. The Board of Directors sets transaction limits for JERAGM and monitors the status of transactions, ensuring proper risk management with respect to market risks and credit risks arising in the fuel business.

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

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
- Income and expenditure fluctuations in upstream development projects due to resource price volatility

Issues

- Increased interest-bearing liabilities due to the surge in resource prices
- Decarbonization efforts in upstream development projects

Business Initiatives

Fuel Business – 2

Utilizing Business Capital

Leveraging one of the world's largest procurement scales, we've formed a competitive fuel portfolio, which includes our involvement in upstream ventures. We continuously seek optimal operations through the use of our own transportation fleet and asset-backed trading, which is made possible by our talent, diverse professionals with experience across our fuel business units, including our overseas subsidiaries.

Key Business Capital

● Manufacturing Capital

- Upstream Investments: 6



Wheatstone LNG Project, Australia
Source: Chevron Australia

- LNG Cargo Fleet: 18 Vessels (as of September 2023)

● Social Capital

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

● Financial Capital

- Revenue: 585.7 billion yen

● Human Capital

- Diverse talent from in and outside of Japan

● Intellectual Capital

- Enriched with profound market insights
- Trading know-how

● Natural Capital

- Total energy consumption: 50.04 million kL (crude oil equivalent)

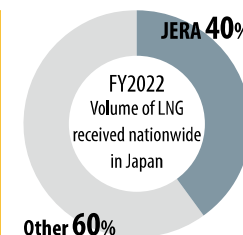
Value Provided

- Stability and flexibility in fuel supply

Business Indicators and Revenue Generation

Our LNG trade volume is approximately 35–40 million tons per year, and we have built a strong and extensive network in the global market. Drawing on our expertise, we efficiently seize profit opportunities in the market and operate smoothly by taking a holistic view of the entire value chain while ensuring proper risk management. Our approach achieves both enhanced fuel supply stability and increased profitability.

LNG Transaction
Volume
Total for FY2022
**35
million tons**



Our Goal for 2025



We 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 energy supply.

Kazunori Kasai

Senior Managing Executive Officer
Chief Optimization Officer (COPTO)

In order for us to properly conduct our business and continue to meet the expectations of our stakeholders, it is essential that we engage in smooth management across the value chain, from upstream fuel development to fuel procurement, transportation, receiving, power generation, and sales. We are working to enhance the specialized skills of our talent within each business area that makes up our value chain. At the same time, by implementing appropriate risk management throughout the entire value chain, we are ensuring that the energy supply aligns with the needs of our customers.

A defining characteristic of our operations is the optimization business that connects the Pacific and Atlantic markets through JERAGM. By leveraging JERAGM's extensive network and expertise in trading, we are able to achieve a balance between stable fuel supply and revenue assurance through transactions with a large number of customers.

The business environment surrounding us 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 renewables. Nevertheless, we will help realize a society that can grow sustainably by solving challenges and continuing to provide a stable energy supply by continuously pursuing optimization across the entire value chain and implementing appropriate risk management.

FOCUS

Fuel Trading By JERAGM – Supporting Communities Through Energy Security

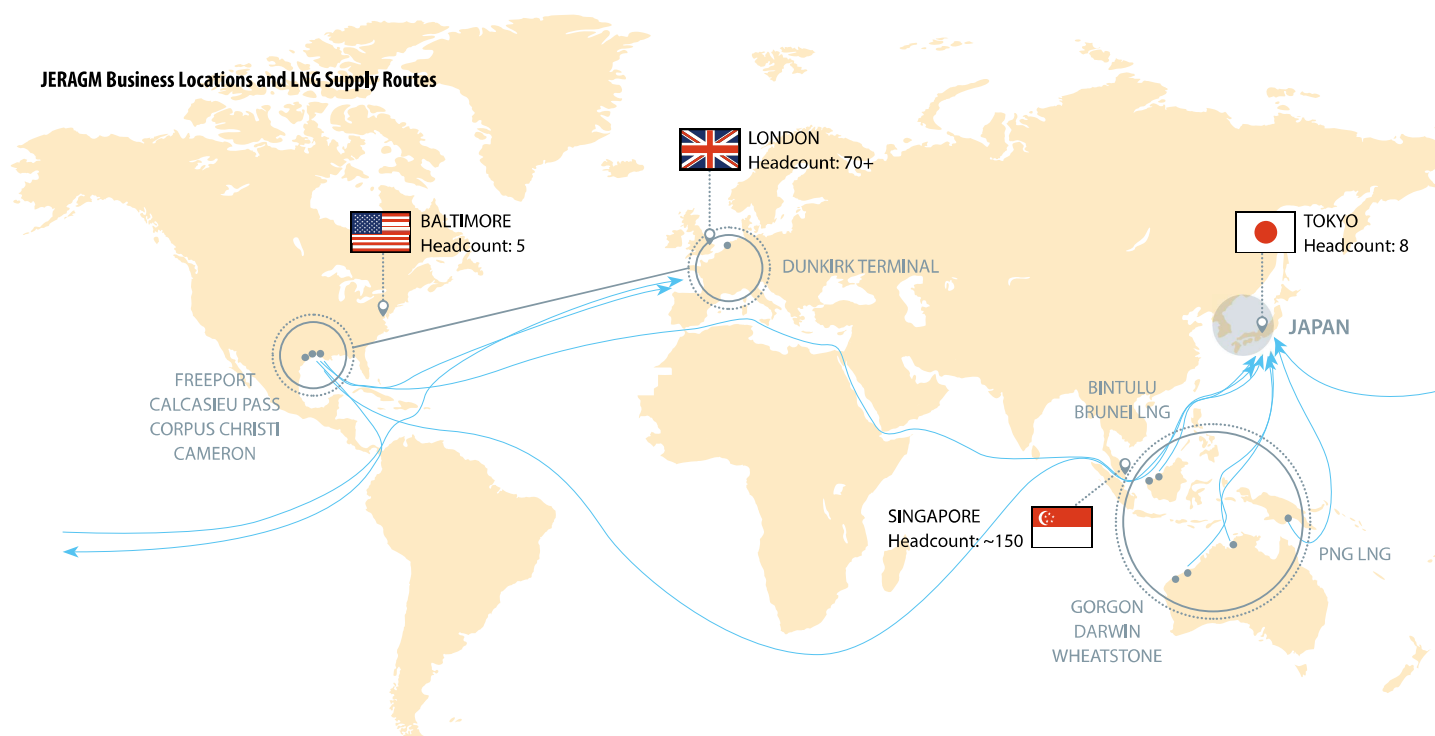
JERAGM operates one of the largest energy portfolios in the world, which gives it an in-depth understanding into the dynamics of local, regional, and international energy markets. These insights enable it to help its customers increase their security of supply, optimize their portfolios, and improve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

JERAGM is the culmination of two very 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.

Strengths of JERAGM

- | | | |
|----------|---|--|
| 1 | Asset-backed Trading Model | <ul style="list-style-type: none"> ● Leveraging the flexibility inherent in fuel contracts ● Optimizes ~10% of global LNG volumes |
| 2 | Global Trading Expertise | <ul style="list-style-type: none"> ● Global base of operations ● Experienced team of traders that deploy asset-backed trading strategies ● Strong fundamental analysis capabilities |
| 3 | Supported By a Robust Foundation | <ul style="list-style-type: none"> ● Middle office to monitor and support transactions ● Centralized transaction management through an IT infrastructure centered on the ETRM system |

JERAGM Business Locations and LNG Supply Routes



Ask an Expert

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



Justin Rowland
CEO, JERA Global Markets

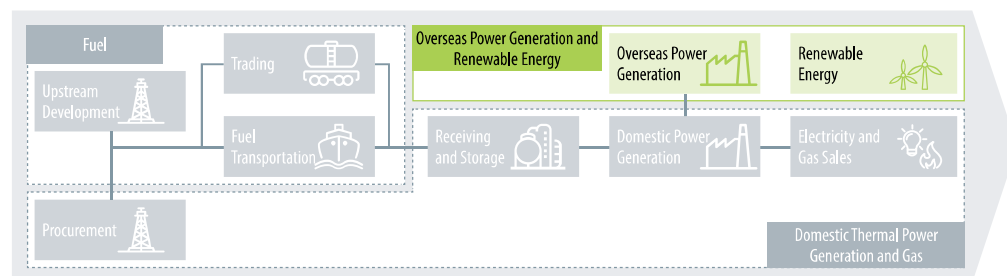
JERAGM continues to play a significant role in JERA's energy procurement strategy, where its activities have continued to display strong performance.

As the global energy landscape continues to evolve, our focus at JERAGM is 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.

Overseas Power Generation and Renewable Energy Business – 1

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 LNG supply and procurement of fuel in addition to infrastructure development in our aims 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 like hydrogen and ammonia, as well as the application of Carbon Dioxide 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.



Business Overview

Overseas Power Generation

Globally, we operate close to 30 projects across over 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.



Renewable Energy

Moving forward, 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 stabilizing the supply-demand balance.



Distinguishing Features

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's essential to not only move our business forward by leveraging the experience and trust we've built through past projects but also 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 tailored to the needs of each region.

Strengths

- Leading the way in initiatives and insights into decarbonization technologies
- 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

Opportunities

- Expansion of competition in electricity and gas sales
- Market creation and new system introductions
- Fluctuations in resource prices
- Worldwide trends toward decarbonization
- Expansion and maturation of global renewable energy market
- Increased demand for storage batteries as a balancing force

Issues

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

Risks

- Shortfalls in adjustment functions due to the expansion of renewable energy
- Adverse impacts arising from the emergence 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

Overseas Power Generation and Renewable Energy Business – 2

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

● Manufacturing Capital

- Number of Projects: Approx. 30 projects in over 10 countries

● Social Capital

- Leveraging networks developed through projects
- Collaborating with platform-based companies

● Financial Capital

- Revenue: 8.6 billion yen

● 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



Nathalie Oosterlinck, Head of key divisions at Parkwind in Belgium and Managing Executive Officer of the Global Renewable Energy Division (left); Kazuo Sakairi, Corporate Vice President and CFO (fourth from right)

Value Provided

- 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

Business Indicators and Revenue Generation

To effectively conduct our business and consistently meet the expectations of our stakeholders, it's imperative that we continually commit to renewable energy development. By bolstering our renewable energy capabilities and growing into one of the world's leading renewable energy providers, we will achieve a robust and global expansion of our renewable energy business.

Renewable Energy
Development Output
Total for FY2022
2.5 GW

Our Goal for 2025



We provide solutions tailored to the unique characteristics of each country and region, ensuring a solid revenue base and contributing to local growth and decarbonization.

Satoshi Yajima

Senior Managing Executive Officer
Chief Power Generation Development Officer (CPGDO)

In our Overseas Power Generation and Renewable Energy, we are advancing initiatives globally that support each country's growth and transition to decarbonization through the provision of clean energy sources, such as renewable energy and low-carbon power. In our pursuit of achieving zero emissions, it's crucial to adopt the strategies best tailored to the unique characteristics of each country and region. Every country requires a unique roadmap to decarbonization. This is because the availability of domestic resources like gas and coal, the potential for renewable energy sources (such as wind, solar, and geothermal), and existing infrastructure, including transmission lines, varies significantly by country. That is why, beyond merely participating in individual projects, we are strengthening its collaborations with business partners involved in multiple ventures. By pooling the expertise of both JERA and our business partners, we are further promoting development and operations tailored to the needs of each market. Furthermore, by actively pursuing energy solutions such as energy transition investments centered on Asia, we aim to achieve an optimal asset portfolio. Through these efforts, we are dedicated to securing a solid revenue base and contributing to regional growth and decarbonization.

Overseas Power Generation and Renewable Energy Business – 3

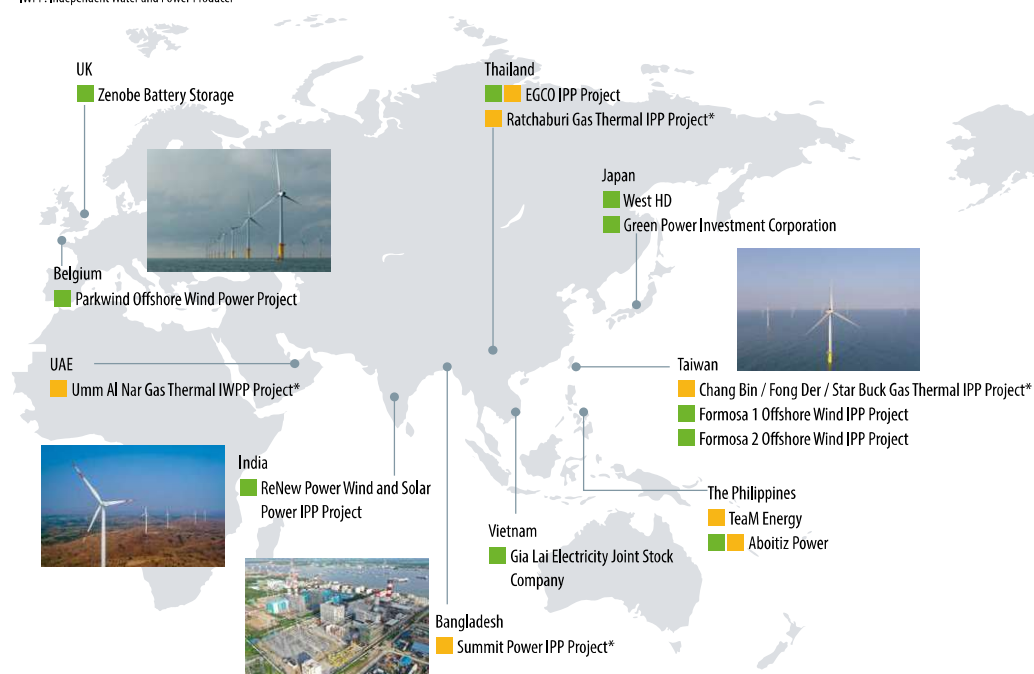
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Platform-Based Companies & Main IPPs*

We are utilizing the experience we have gained from each of the countries where we operate to engage in business development. Recently, we have been steadily expanding our renewable energy ventures, primarily in offshore wind power generation, through equity acquisitions in projects like the Brady Gas Power IPP business in the United States, our joint venture with Gia Lai Electricity Joint Stock Company in Vietnam, Parkwind in Belgium, and Green Power Investment Corporation in Japan. Moreover, in Asia, we are bolstering our collaborations with platform-based companies that have a strong presence in local markets and offer access to a wealth of business opportunities. In light of evolving business conditions, we endeavor to achieve an optimal asset composition by reorganizing our portfolio through asset divestitures and reinvestments, with a focus on securing funds and increasing earnings.

* IPP: Independent Power Producer

IWPP: Independent Water and Power Producer

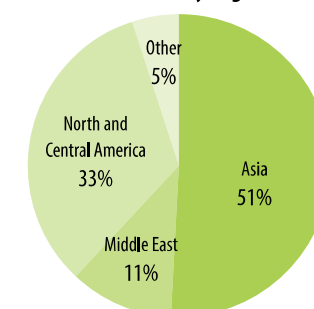


Main Platform-Based Companies Business Investments*

Country	Company
The Philippines	TeaM Energy
The Philippines	Aboitiz Power
Thailand	EGCO
Bangladesh	Summit Power International
Vietnam	Gia Lai Electricity Joint Stock Company
India	ReNew Power
Belgium	Parkwind
Japan	Green Power Investment Corporation

*Platform-based companies business investments: Businesses involved in multiple power generation projects, etc.

Business Portfolio by Region



Ask an Expert



Strategic considerations for Asia's growing energy demand

Steven Winn

Senior Managing Executive Officer
Chief Global Strategist (CGS)

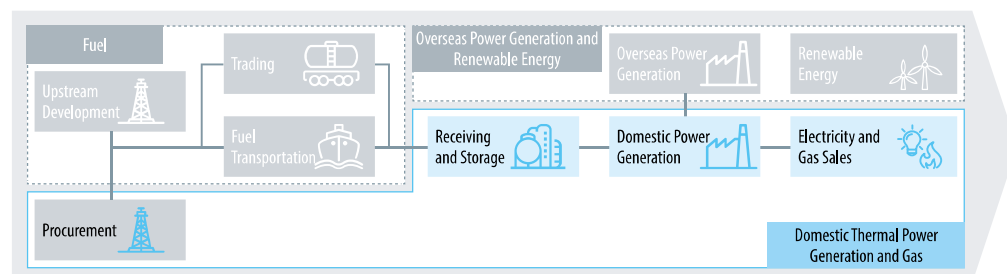
Asia, in particular, is witnessing a surge in energy demand, but there's also a heightened push toward zero emissions. It's imperative to navigate the dual path of ensuring a stable supply to meet the growing demand while actively pursuing zero-emission initiatives. We are contributing to the development of roadmaps for achieving zero emissions in each country and are working together to make them a reality. Achieving national carbon neutrality requires a range of options, such as hydrogen, ammonia, and renewable energy. Consequently, it's difficult to achieve this through participation in individual projects, underscoring the importance of collaboration with platform-based companies in regions with multiple business opportunities. More specifically, we are advancing efforts with these platform-based companies in different nations throughout Asia, including the formalization of a memorandum of understanding with Summit Power International, a company with expertise in Bangladesh, to jointly develop a decarbonization roadmap.

Domestic Thermal Power Generation and Gas Business – 1

Positioning Within the Value Chain

We are the largest power company in Japan, supplying approximately 30% of all domestic power generation output. Ensuring a stable supply of energy is the utmost priority in the Domestic thermal power generation and gas business. We achieve an economical and reliable supply by combining fuel procurement with the optimal operation of our power generation portfolio and our expertise in operating and maintaining power generation facilities.

In recent years, we have leveraged the electricity market and continued to make contributions to its growth and maturation. Looking ahead, we will continue to offer solutions to meet the evolving customer demands, including the establishment of a clean energy supply infrastructure needed to realize a decarbonized society.

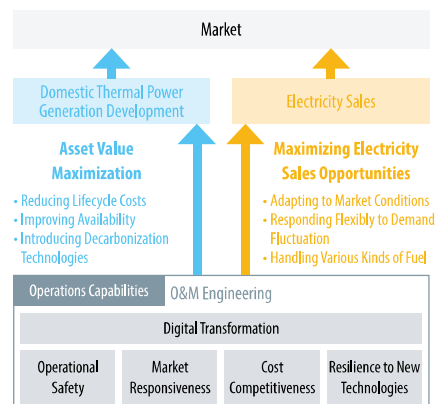


Business Overview

O&M Engineering to Maximize Market Value

O&M Engineering is maximizing the market value of energy produced by JERA through its contribution to domestic thermal power development by maximizing asset value as well as to electricity sales by maximizing sales opportunities.

We are enhancing our safety operational capabilities, making safety an integral part of our corporate culture. We are also strengthening our market responsiveness to respond flexibly to volatility, improving our cost competitiveness to reduce facility lifecycle costs, and improving our capacity to acquire new technologies such as decarbonization and battery storage. Additionally, we are leveraging digital technologies to further elevate these capabilities.



Domestic Thermal Power Generation Development

We are in the process of replacing existing thermal power plants with facilities that have higher thermal efficiency and lower CO₂ emissions, making the most of their existing locations. Moreover, we are working on the construction of receiving facilities for decarbonized fuels like ammonia and hydrogen, alongside their power generation facilities, to accelerate the transition to carbon-neutral fuels that result in zero CO₂ emissions during combustion.



Electricity and Gas Sales

We are able to sell electricity and gas to meet the diverse needs of our customers based on our supply capabilities backed by our excellent track record of thermal power generation and experience with large-scale fuel contracts. In addition to traditional retail sales to both shareholder companies, we are expanding our sales channels to include third-party wholesalers and market trading, with a focus on unbiased risk management for both domestic and international markets. We have also established a subsidiary for electricity trading, allowing us to effectively manage and utilize our power sources and contract capacity.

Moving forward, we will continue to expand our market presence while ensuring a balance between a stable energy supply and increased profitability as a trusted power generation company by customers and business partners alike.



Distinguishing Features

Our business faces numerous challenges, such as risks associated with fluctuating resource prices and the complexity of plant operations amidst significant volatility in domestic thermal power demand. Nonetheless, we adapt flexibly and respond swiftly by utilizing diverse fuel procurement sources and trading strategies in the face of resource price fluctuations. Additionally, we leverage diverse sales channels, including market transactions, and draw upon our years of experience in thermal power generation management to provide the best possible response to fluctuations in domestic thermal power demand.

Strengths

- Flexible and agile response based on expertise in thermal power generation and operation cultivated over years of experience
- A team of highly-skilled professionals in each area of technical expertise
- Robust on-site capabilities with excellent safety and disaster-prevention performance
- A competitive and flexible fuel procurement portfolio
- Know-how in market transactions

Opportunities

- Applying digital technologies
- Attaining zero emissions
- Improving liquidity in the domestic electricity market
- Evolving customer needs in electricity and gas sales

Risks

- Fluctuations in resource prices
- Negative impact of geopolitical risks on fuel procurement
- Risk of natural disasters such as major earthquakes
- Disruption of operations caused by equipment problems or accidents

Issues

- Optimization of plant operations and fuel/power utilization in highly volatile conditions
- Decarbonization of thermal power generation
- New approaches to work enabled by digital technology

Domestic Thermal Power Generation and Gas Business – 2

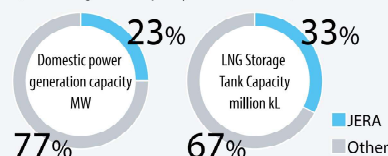
Utilizing Business Capital

We benefit from a versatile workforce of professionals in technical fields such as plant operation, facility engineering, and data analysis, allowing us to leverage our operational expertise across an 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^{*1}
(Domestic power generation capacity: 61 GW)
- Number of LNG terminals in Japan: 11^{*2}
(LNG Storage Tank Capacity: 6.65 million kL)



Social Capital

- Promoting community engagement around our power plants

Financial Capital

- Revenue: 6,153.4 billion yen

Human Capital

- Approx. 3,000 professionals in specialized technical fields

Intellectual Capital

- Know-how cultivated over years of experience in thermal power generation and operation
- Electricity market expertise
- Know-how in fuel procurement and power operations

Natural Capital

- Total energy consumption: 50.04 million kL (crude oil equivalent)
- LNG/LGP consumption: 23.67 million tons
- Coal consumption: 21.46 million tons
- Water usage: 20.18 million m³

^{*1} Includes power plants under construction

^{*2} Includes jointly operated LNG terminals

Value Provided

- Stable energy supply
- Decarbonization of thermal power generation
- Stable fuel procurement

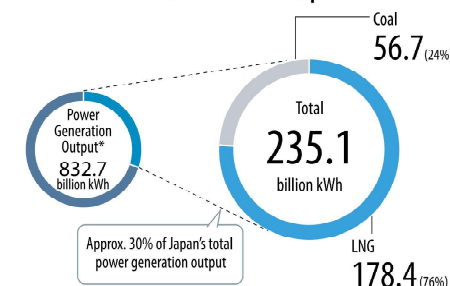
Business Indicators and Revenue Generation

We rank among the world's largest power producers and play a pivotal role in ensuring a dependable electricity supply in Japan through its substantial power generation output. These electricity generation figures include not only the power generated by state-of-the-art replacement thermal power sources but also the electricity generated through the reactivation of idle thermal power sources, which were awarded contracts through public bidding during the peak-demand summer and winter periods.

Source: Agency for Natural Resources and Energy website

(https://www.enecho.meti.go.jp/statistics/electric_power/ep002/) (Japanese)

FY2022 Domestic Power Generation Output



Our Goal for 2025



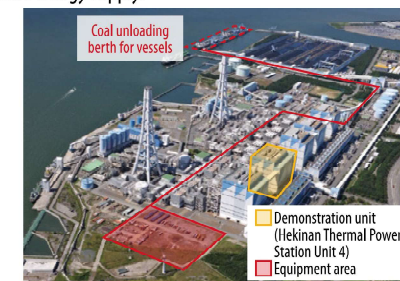
We equip professionals with the skills needed to make significant contributions to ensuring a stable energy supply and achieving a decarbonized society.

Tetsuya Watabe

Corporate Vice President, Managing Executive Officer
Chief O&M Engineering Officer (COMEO)

The domestic thermal power and gas business is both essential for the lives of the Japanese people and essential to our business. Over the years, we have relentlessly refined our operational capabilities in power plant management out of our longstanding commitment to ensuring a reliable power supply. In the face of shifts in the power market and changing demographics, which include a declining birthrate and an aging population, we aim to enhance our market responsiveness and cost competitiveness by nurturing a global pool of professionals, primarily across Asia, to ensure a stable energy supply.

As part of our commitment to JERA Zero CO₂ Emissions 2050, we will commence demonstration tests in FY2023 to replace conventional fuels with ammonia and hydrogen, starting with Hekinan Thermal Power Station Unit 4. Achieving this requires not only the development of combustion and receiving facilities but also a robust on-site workforce with a strong emphasis on safety and disaster preparedness. As a frontrunner in decarbonization, we're committed to further enhancing our on-site capabilities and contributing to the realization of a decarbonized society.



Hekinan Thermal Power Station Unit 4 (Under Construction)

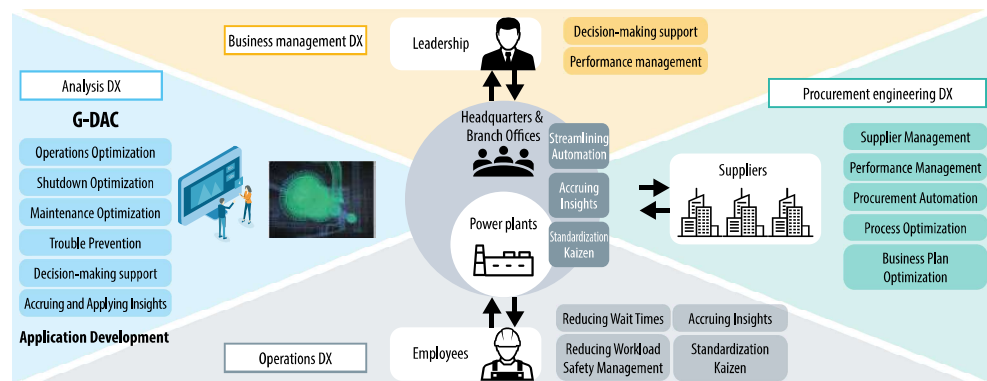
Domestic Thermal Power Generation and Gas Business – 3

FOCUS

Digital Power Plant (DPP) Project

We harness digital technology to create cutting-edge O&M solutions. Cutting-edge solutions are not confined to just a few power plants. We're driving integrated operations, encompassing our headquarters, power plants, and partners. This is the essence of our Digital Power Plant (DPP) Project.

Within the framework of the DPP project, we are promoting digital transformation (DX) across four critical aspects: operations, analysis, business management, and procurement, with a central focus on power plants. Our endeavors encompass advanced data analysis for predictive monitoring, the development of DPP applications, the integration of operations through the metaverse, and the implementation of JERA knowledge management with AI-generated capabilities.



Ask an Expert



Norihisa Tegawa
Head of the G-DAC Group, O&M
Engineering Strategy Division

The DPP project is a company-wide project to transform the way we work at our power plants. Power plant engineers are rapidly developing applications and integrating them into their operations to achieve our vision of creating new forms of work and value through the synergy of people, technology, and data. Our journey involves embracing a fresh approach where power plants and the remote integration division work cohesively, alongside our dedication to continuous improvement in pursuit of a stable energy supply and a shift towards sustainable power plant operations.

Development of applications related to power plant operations

We aggregate power plant facilities and personnel data in the cloud, enabling real-time visualization and sharing of plant data and information. Additionally, we digitize the expertise of our O&M professionals, developing in-house applications for efficient and optimized performance management and maintenance of power plants.

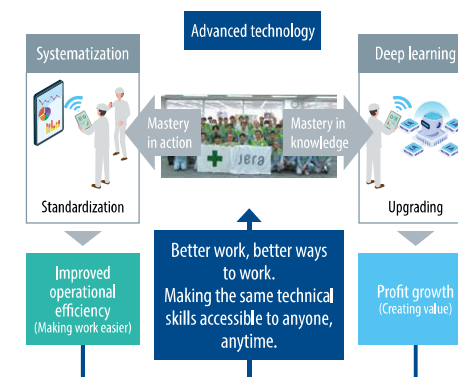
The use of these applications will help us revolutionize the entire spectrum of power plant operations, ultimately driving profit growth.

- Anegasaki Thermal Power Station → P.37
- Digital Transformation (DX) → P.38

G-DAC: Real-time support for domestic and international power generation facilities

In July 2023, we established the Global Data Analyzing Center (G-DAC) as a remote integration division to provide real-time information and data analysis for domestic and international power generation facilities alongside cutting-edge O&M solutions. With the launch of G-DAC, we are now equipped to provide round-the-clock support not only for our domestic power generation facilities but also for those of our customers, both domestic and overseas.

G-DAC Supporting Points

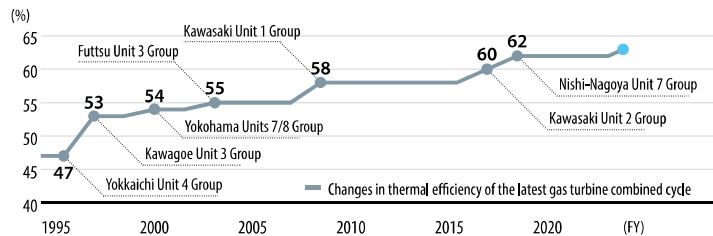


Initiatives at Thermal Power Plants in Japan

Anegasaki Thermal Power Station

Replacing Existing Facilities with Highly Efficient and Agile Power Plants

After 60 years of operation, the Anegasaki Thermal Power Station has undergone a remarkable transformation. Units 1 to 4 have been decommissioned, making way for the construction of a cutting-edge LNG thermal power plant with replacement units that boast world-leading power generation efficiency of around 63%. Apart from achieving a nearly 30% reduction in CO₂ emissions compared to the decommissioned facilities, it also offers exceptional flexibility.



Featured

Restarting Idle Thermal Power Plants Due to Supply-Demand Pressures

In response to government requests and to address supply-demand pressures since the winter of 2021, we have resumed operations multiple times at Units 5 and 6 of Anegasaki Thermal Power Station, which were under a long-term planned shutdown. Despite the need for substantial restoration work and inspections, the power plant staff's collective efforts played a vital role in securing a stable electricity supply.



Data-Driven Power Plant Operations and Innovative Ways of Working

Anegasaki Thermal Power Station is a model facility that has incorporated cutting-edge technology from the DPP project. It leverages innovative work methods driven by our applications developed in-house, and it operates seamlessly with the remote integration division.

A Real-Time & Borderless Approach to Work

(Sharing On-Site Data and Facility Management Information)

Rapid, borderless sharing of operational and on-site data enables us to take appropriate action informed by historical analyses



(Applying our Know-How and Expertise to Enhancing Maintenance)

Optimizing maintenance plans based on quantified lifecycle costs, risks, and lifespan



(Sharing and Evaluating Market Insights for Operational Decisions)

We aim to optimize power plant operations by consolidating market insights and sales information and responding to this data in real time



Integrated Operation with the Remote Integration Division

(Predictive Management)

We employ an internally developed system that merges our extensive plant knowledge from operations at home and abroad with AI technology, enabling us to preemptively detect anomalies, conduct thorough analysis, and propose solutions early on.



Ask an Expert

Naoyuki Sotoda

O&M Engineering Strategy Division
Anegasaki Thermal Power Station
Operation 1st Unit



During preparations to restart Unit 5, we realized that there would be a substantial loss of technical knowledge as experienced employees retire. The introduction of the DPP Project will allow data to be stored and utilized throughout JERA and facilitate the transfer of technical knowledge and more efficient workflows. Moving forward, our efforts will focus on improving the app's user-friendliness as we aim for a seamless, intuitive user experience. Our overarching goal is to further streamline and enhance the efficiency of our O&M operations through these initiatives.

Digital Transformation (DX)

Through cutting-edge technology and data utilization, we aim to become a Japan-based global energy company



Positioning of JERA's DX Strategy

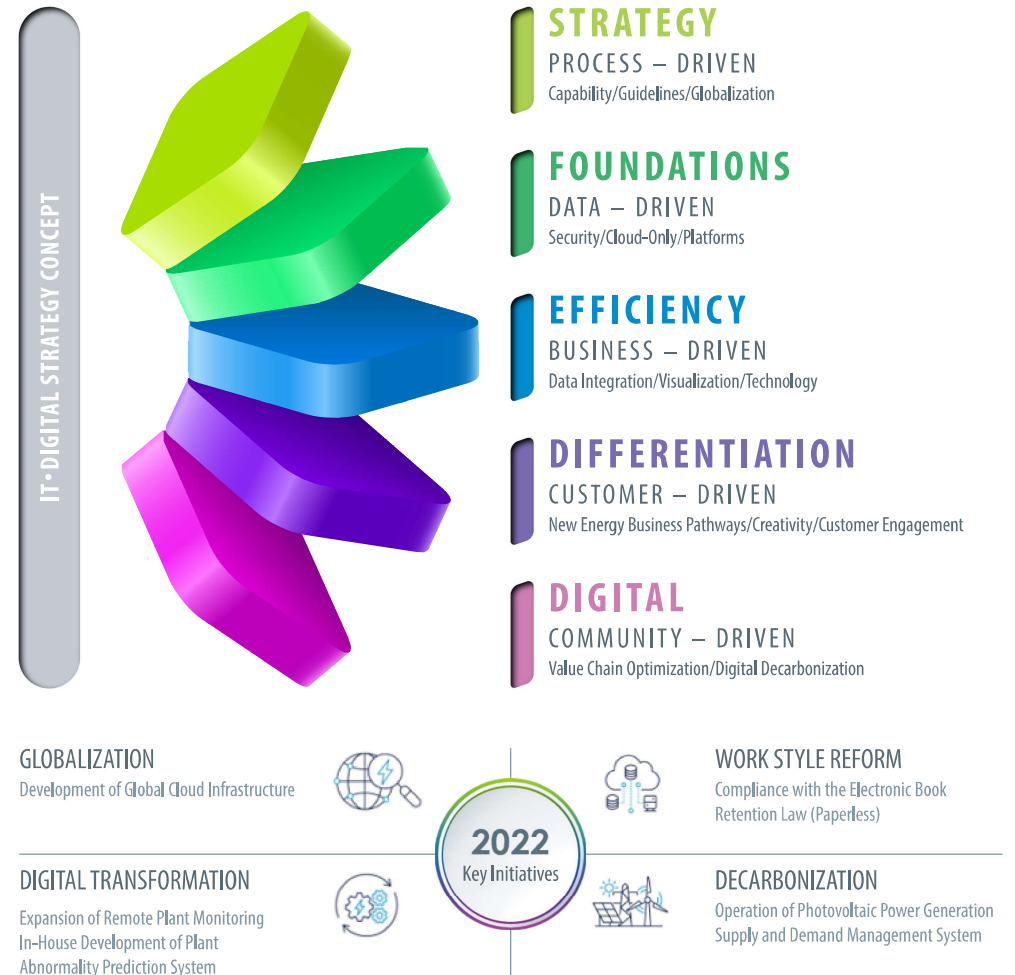
JERA aims to become a global energy leader rooted in Japan and committed to realizing a decarbonized society. We will achieve this by enhancing operational efficiency and creating new business value through the utilization of cutting-edge technology and data.

Digital Transformation (DX) Strategy Policy

Our DX strategy revolves around three key pillars: innovation/disruption, customer-centricity, and intelligence-driven decision-making. Through these pillars, we strive to make substantial contributions to decarbonization and sustainability initiatives, all while fostering business growth and driving transformative changes across our organization.

Strengthening Talents towards DX

To achieve a decarbonized society, we must leverage digital technology within our businesses. Every employee should strive for greater efficiency and enhanced decision-making in their work. Our company has launched the JERA Digital Academy (JEDI), a DX talent development program for all of our 5,000+ employees, including those overseas. This program offers education to a range of individuals, from on-site employees to management and DX specialists engaged across our business. Additionally, we are rolling out change management initiatives to enhance IT literacy and ensure that all employees share a common awareness of digital transformation.



Digital Transformation (DX)

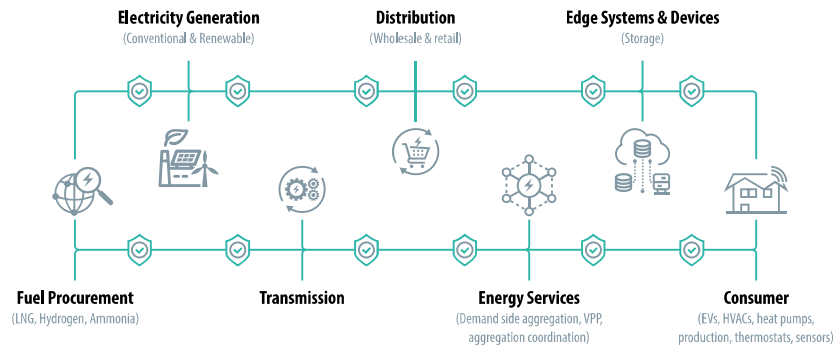
DX Initiative 1

Establishment of Trusted Energy Interoperability Alliance (TEIA)

JERA, in cooperation with Intertrust Technologies Corporation, an investment partner, has established a new company aiming to standardize communication methods in the energy sector. This venture is a collaboration with energy companies based in Europe and Australia.

We are committed to achieving decarbonization by leveraging digital technologies and aspire to build a clean energy supply infrastructure that combines low-carbon thermal power generation with renewable energy sources. To accomplish this, standardizing communication methods between equipment and operators to ensure security is essential. Additionally, the development of an energy platform capable of advanced data analysis is crucial. In the future, we will continue to work on standardization with energy-related companies both domestically and internationally, advancing the establishment of an environment for data utilization.

Integrated security across the value chain



Talal Shamoon
Intertrust Technologies CEO

We Asked the TEIA Co-Founder

Q. What is the aim of the TEIA collaboration?

Energy is an ecosystem-driven industry. By standardizing two-way communication systems between thermal and renewable power plant equipment and data platforms, energy companies can flexibly select safe and stable equipment and realize lower-cost operations.

DX Initiative 2

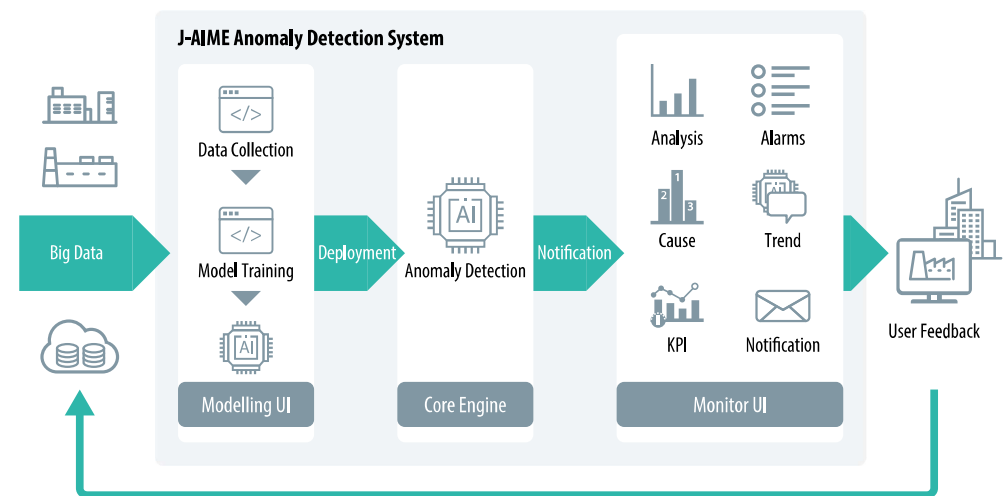
Development of in-house Anomaly Detection System

Utilizing the know-how accumulated by our company's engineers to date, as well as the operational data from power plants, JERA has developed an internal system called 'JERA AI Microservices for Energy (J-AIME)', which enables efficient power plant operation, led by our own data scientists.

By combining AI and IoT, including visualizing the analysis and detecting abnormal conditions in facilities and identifying root causes by extracting patterns from past failure data, we provide highly efficient and operational power plant management through the early detection of abnormal signs.

To ensure sustainable system operation, the introduction of a machine-learning infrastructure is in progress. We are working to support complex operations by efficiently managing a large number of models created with various solutions, standardizing the processes involved in model construction and operation, and reducing labor hours.

We have launched external services and will continue to provide solutions that lead to further improvements in value.



Context

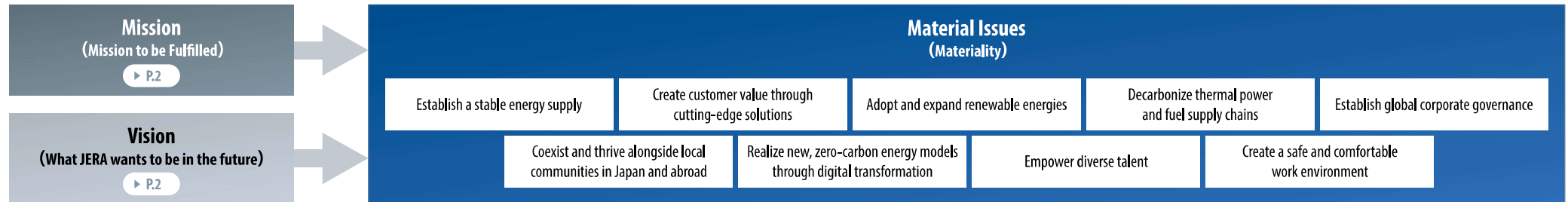
The Infrastructure Behind Our Strategies

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Material Issues

We identified and published our material issues starting in 2020 based on the targets set forth in our April 2019 business plan. We continue to review our material issues in response to changes in the internal and external environment, and in FY2022, we pinpointed nine issues guided by the new corporate vision and JERA Environmental Target 2035, which were both announced in May 2022. To achieve our mission and vision, we are committed to management conscious of these material issues.



How We Set Our Material Issues

Material issues have been identified by extracting issues based on external demands and business strategies and then assessing them based on their importance to stakeholders and the company. These issues are then addressed accordingly as they evolve by revisiting them and adjusting their KPIs.

STEP 1

Identify Issues

We composed a list of 59 issues pertinent to our company following an analysis of the industry environment, our business plans, and other factors.

Reference Guidelines

- ISO 26000
- SDGs
- GRI
- SASB
- FTSE
- Material issues of industry peers

STEP 2

Assess Importance and Relevance

We evaluate each of the 59 issues identified in Step 1 in terms of their importance to stakeholders and their importance to the company. We then assess their relevance to factors like company strategy and stakeholder opinion.

Evaluation Methods

- Importance to Our Stakeholders
Quantitative assessment of importance to our customers, business partners, local communities, shareholders and investors, and employees
- Importance to JERA
Quantitative assessment based on impact on revenue/ costs, reputation, compliance, and alignment with business strategy

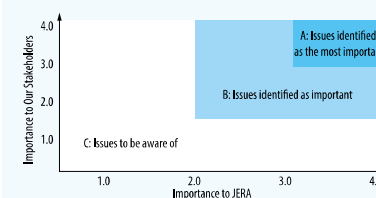
STEP 3

Identify Material Issues

Taking into account Step 2 assessments, the Sustainability Promotion Committee (chaired by the President, Director, CEO and COO) designates material issues

Method of Identification

Issues were categorized into three categories: A: issues identified as the most important; B: issues identified as important; and C: issues to be aware of. Issues in categories A and B were identified as material issues.



STEP 4

Revise Material Issues

We continue to revise material issues in light of the social landscape and stakeholder feedback.

Focus of FY2022 Revisions

- Number of Material Issues:
Narrowed down from 22 to 9 items
- Focus of Revisions:
Based on changes in the business environment, we formulated our Corporate Vision for 2035 and JERA Environmental Targets 2035, which derive elements from existing material issues and consolidate them into nine items.

List of Material Issues and Major Initiatives

● Major Initiatives ◎ KPI (Key Performance Indicators)

	Material Issues	Major Initiatives & KPIs	Related Pages	Related SDGs
1	Establish a Stable Energy Supply	● Stabilize supply and demand management ◎ Replace domestic facilities representing 7–9 GW of energy (at 5–7 sites) ● Optimize security measures and monitoring systems in line with global standards ● Enhance JERA's business continuity plan (BCP) and business continuity management (BCM) ● Improve disaster preparedness through systematic education and training ● Build a disaster prevention infrastructure by maintaining reserves	Business Initiatives – Fuel Business (P. 28) Business Initiatives – Overseas Power Generation and Renewable Energy Business (P. 31) Business Initiatives – Domestic Thermal Power Generation and Gas Business (P. 34) Initiatives at Thermal Power Plants in Japan (P. 37) Climate-related Disclosures (Response to TCFD Recommendations, etc.) (P. 44) Safety (P. 61) Risk Management (P. 72) Information Security (P. 75)	    
2	Create Customer Value through Cutting Edge Solutions	● Develop new technologies that can spearhead a sustainable society ● Further innovate by combining new technologies with power generation technology ● Strategically acquire intellectual property in Japan and abroad and apply it to new business ● Develop and deliver solution selling that ties in with company business	Value Creation Process (P. 13) JERA Zero CO ₂ Emissions 2050 (P. 17) Zero-Emissions Thermal Power (P. 19) Renewable Energy Business (P. 21) Business Initiatives – Overseas Power Generation and Renewable Energy Business (P. 31) Business Initiatives – Domestic Thermal Power Generation and Gas Business (P. 34)	  
3	Adopt and Expand Renewable Energies	◎ Target renewable energy development representing 5 GW of energy by FY2025 ● Acquire essential know-how about offshore wind power	JERA Zero CO ₂ Emissions 2050 (P. 17) Renewable Energy Business (P. 21) Business Initiatives – Overseas Power Generation and Renewable Energy Business (P. 31) Climate-related Disclosures (Response to TCFD Recommendations, etc.) (P. 44)	 
4	Decarbonization of Thermal Power and Fuel Supply Chains	● Establish hydrogen and ammonia supply chains ◎ Utilize ammonia effectively, with demonstration tests of conversion rates of 20% at Hekinan Thermal Power Station Unit 4 planned for FY2023, commercial operation of conversion rates of 20% targeted for the late 2020s, and commercial operation of conversion rates of 50% intended to begin in the early 2030s ◎ Utilize hydrogen effectively, with commercial operation planned for the 2030s ● Pursue carbon capture and storage (CCS) know-how and project opportunities	JERA Zero CO ₂ Emissions 2050 (P. 17) Zero-Emissions Thermal Power (P. 19) Business Initiatives – Overseas Power Generation and Renewable Energy Business (P. 31) Business Initiatives – Domestic Thermal Power Generation and Gas Business (P. 34) Climate-related Disclosures (Response to TCFD Recommendations, etc.) (P. 44)	   
5	Establish Global Corporate Governance	● Improve board effectiveness ● Instill and put into practice a compliance culture and strengthen the JERA Group compliance system ● Make improvements to reporting of financial and non-financial information	ESG and Sustainability Management System (P. 43) Stakeholder Engagement (P. 64) Corporate Governance: (P. 65) Directors & Officers (P. 68) Compliance (P. 76)	
6	Coexist and Thrive alongside Local Communities in Japan and Abroad	● Take action to coexist with the environment, educate the next generation, and resolve issues in local communities based on our Social Contribution Activity Policy ● Build good relationships with stakeholders through cooperative efforts with the community ● Strengthen systems for the prompt and proper reaction in response to domestic and international crises ● Practice global corporate social responsibility (CSR) founded on the needs of overseas sites	Environment (P. 49) Coexisting with Local Communities (P. 59) Safety (P. 61) Stakeholder Engagement (P. 64) Risk Management (P. 72)	    
7	Realize New, Zero-Carbon Energy Models through Digital Transformation	● Acquire cutting-edge IT technologies such as AI and machine learning by upgrading our R&D environment and building relationships with leading technology companies, among other efforts ● Establish the foundation for maximizing data usage, defining parameters, and promoting data education ● Promote the digitization of data at power plants, including those overseas ● Offer digital education to all employees	Business Initiatives – Domestic Thermal Power Generation and Gas Business (P. 34) Digital Transformation (DX) (P. 38)	   
8	Empower Diverse Talent	● Disseminate major talent initiatives both internally and externally ● Evolve and expand mechanisms to attract diverse talent (e.g., broaden the pool of new graduate and mid-career candidates and strengthen partnerships with educational institutions) ● Establish systems that promote self-driven career development (e.g., create structures for skill advancement and career paths, provide consultation services, and expand internal promotion efforts) ● Build attractive compensation packages (introduce a job-based HR system, revise retirement benefit schemes and seniority systems) ● Realize borderless human resources (e.g., increase global mobility irrespective of hiring location) ● Cultivate corporate culture (e.g., promote diversity and inclusion, health management) ◎ Increase the percentage of female employees in leadership positions (targeting 15% in officer positions and 8.5% in management positions by FY2025) ◎ Maintain and improve employee engagement (employee satisfaction survey index for FY2022: 68.8%)	Talent Acquisition & Retention Strategy (P. 52)	    
9	Create a Safe and Comfortable Work Environment	● Continuous leadership from top management and raising individual safety awareness ● Construction of a robust management system to lead our safety efforts ● Effective safety activities to address changes in the environment ◎ Number of fatalities: 0 ● Establish contingency plans for overseas operations ◎ Continued selection under the Certified Health & Productivity Management Outstanding Organizations Recognition Program ◎ Promotion of work-life balance (reduce overtime hours, promote taking leave)	Talent Acquisition & Retention Strategy (P. 52) Safety (P. 61) Risk Management (P. 72)	 

ESG and Sustainability Management



JERA's ESG and Sustainability Management Goals

Tatsuya Tsunoda
Managing Executive Officer (ESG)

JERA was founded to grow into an internationally competitive and truly global energy company in the hopes of overcoming the energy crisis facing Japan after the Great East Japan Earthquake. We prioritize compliance and are establishing a global governance structure to maximize our corporate value in a sustainable manner by fully leveraging the synergies of this joint venture between Tokyo Electric Power Company and Chubu Electric Power Company. Our management is in the hands of seasoned professionals in the fields of business and energy, ensuring autonomous decision-making.

In terms of the environment, we are committed to fulfilling our responsibility to society as one of the world's largest energy providers through decarbonization and waste reduction, all while providing a stable supply of energy. It is no exaggeration to say that our core business is inherently rooted in our environmental initiatives.

With respect to our social initiatives, we consider the safety of all internal and external stakeholders to be a top priority. This includes our employees and the local communities near our power plants, where we have built a culture of safety over many years. JERA is a relatively young company, having only achieved full integration into its present business structure in 2019. We are in the process of building a vibrant corporate culture filled with individuals of diverse nationalities, career paths, skills, and expertise, all thriving in an open and ambitious environment.

Moving forward, we will continue to deepen our engagement with all our stakeholders, incorporating their feedback as we strive towards our vision of ideal ESG and sustainability management.

Enhancing Our ESG and Sustainability Promotion System

Under the supervision of the Board of Directors, JERA's ESG and Sustainability Promotion System has been reorganized into the Sustainability Promotion Committee, chaired by the Leadership Panel and the President, Director, CEO and COO to examine internal and external issues regarding ESG, Sustainability, and SDGs. This will improve both the speed and effectiveness of management decisions.

In addition, our four subcommittees that had functioned in separate domains under the Sustainability Promotion Committee (the Environmental Subcommittee, Society and Human Rights Subcommittee, Governance Subcommittee, and PR and IR Subcommittee) have been consolidated as the Working-level Conference. The newly established unit dedicated to ESG and sustainability supports the Working-level Conference, promoting ESG and sustainability from a company-wide, cross-functional perspective.

Recommendations on ESG and Sustainability to the Board of Directors

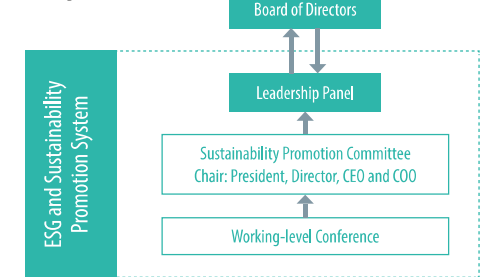
An advisory group*, consisting mainly of outside experts in energy and corporate management, has provided advice and recommendations to the Board of Directors on the ESG and sustainability issues that we should address.

Note: Joseph Naylor, Director; Paul Hanrahan GAE*; Nobuo Tanaka GAE*; Hendrik Gordenker, Senior Advisor; etc.)

*Global Advisory Expert: An outside expert with deep knowledge of global management. Invited into the group as an advisor.

ESG and Sustainability Management Structure

(As of August 31, 2023)



Internal Outreach: Power Plant Tours for ESG Awareness

We believe every employee is crucial in advancing ESG and sustainability management. As such, we prioritize dialogue with our team focused on issues related to ESG and sustainability. In FY2022, the Managing Executive Officer (ESG) and the Managing Executive Officer (D&I) teamed up to visit all of our power plants in Japan.

Employees were informed of external stakeholder expectations and our overall ESG and sustainability initiatives, and we engaged in discussions about related activities being conducted at each of our power plants. We also explored considerations and innovative approaches to increase talent diversity in the workplace. Through these activities, employees have a heightened awareness of how their individual commitment to ESG and sustainability can directly contribute to the creation of corporate value. (See P. 49 for more information on environmental initiatives.)



Group photo with Kawagoe Thermal Power Station staff

Featured

Participation in the UN Global Compact

To further promote ESG and sustainability management, we endorsed the objectives of the United Nations Global Compact and joined its network in July 2023.



Climate-related Disclosures (Response to TCFD Recommendations, etc.)

Fundamental Approach

As a global company committed to solving energy problems in Japan and around the world, we consider measures to combat climate change to be a priority issue and have identified the relevant material issues.

In September 2021, we endorsed the TCFD^{*1} recommendations and joined the TCFD Consortium.^{*2} To properly evaluate climate change-related risks and opportunities and sustainably enhance our corporate value, we have identified four elements—governance, risk management, strategy, and metrics and targets—in line with the TCFD Recommendations that summarize our climate change-related systems, our business in general, and the initiatives typified by the Three Approaches of JERA Zero CO₂ Emissions 2050.

We will continue to disclose information related to climate change in line with the TCFD recommendations and further enhance communication with investors and other stakeholders.

^{*1} The Task Force on Climate-related Financial Disclosures (TCFD) is the task force established by the Financial Stability Board (FSB) at the request of the finance ministers and central bank governors of G20 countries to avoid destabilization of the financial system in the face of factors attributable to climate change. The task force has published a framework and recommendations to guide companies' disclosures pertaining to the risks and opportunities posed by climate change.

^{*2} The TCFD Consortium is a forum established for companies and financial institutions that endorse the TCFD Recommendations to hold discussions and work together to ensure effective disclosures by companies and facilitate sound investment decisions by the financial institutions to whom the disclosures are made. To further enhance disclosures in line with the TCFD Recommendations and promote constructive dialogue between investors and companies, the consortium actively publishes guidance on various matters and also hosts TCFD Summits to give companies and financial institutions from around the world opportunities to gather in one place.



Governance and Risk Management



Governance

Decisions about important policies, new and updated targets, and other matters pertaining to measures to combat climate change are made by the Board of Directors or the Leadership Panel based on our corporate governance system. We have also established a Sustainability Promotion Committee for the purpose of enhancing sustainability management, as well as environmental, social, and corporate governance (ESG) management. This cross-departmental committee is chaired by the President, Director, CEO and COO and reports directly to the Board of Directors. It will examine measures to combat climate change and other environment-related issues.

Directors hold active discussions with outside experts and specialist organizations to keep pace with the latest information and findings, which they share with the Leadership Panel and other internal groups. We also host seminars regarding ESG and sustainability for our employees in addition to providing opportunities for them to have discussions with the directors. We are proactively working to further improve our ESG and sustainability activities by continuing to expand our directors' and employees' understanding of information and trends in climate change and other aspects of ESG and sustainability management.

Corporate Governance → P.65

ESG and Sustainability Management Structure → P.43

Risk Management

We have established a risk management system headed by the President, Director, CEO and COO to understand and mitigate risks associated with corporate activities. The system conducts integrated risk management, categorized into operational, market, and credit risks. We identify climate change-related risks in recognition of their potential to impact the different types of risk. Risks to be managed by directors are identified as significant risks to be managed by management. The Risk Management Committee (chaired by the President, Director, CEO and COO) monitors and reviews the management status and plans for responding to these risks and then reports them to the Board of Directors at scheduled intervals or as needed.

Risk Management → P.72

Climate-related Disclosures (Response to TCFD Recommendations, etc.)

Strategies

Scenario Configuration

The following two scenarios have been established to analyze the risks and opportunities related to climate change across the entire value chain of our business.

	1.5°C Scenario References: IEA World Energy Outlook 2022 NZE, the Japanese government's Sixth Strategic Energy Plan, IPCC Sixth Assessment Report, Working Group 1: SSP 1-1.9, SSP 1-2.6	4°C Scenario References: IEA World Energy Outlook 2022 STEPS, IPCC Sixth Assessment Report, Working Group 1: SSP 3-7.0, SSP 5-8.5	Time-series Variations in Relevant Parameters
Policy/Regulatory Changes	- Ambitious energy policies are underway in each country to curb a global rise in average temperatures. - Carbon pricing has been introduced over a vast range of regions, and prices are rising rapidly in both developed and developing economies that have declared a commitment to Net-Zero Emissions.	- Existing energy policies will be maintained in each country, and no ambitious policies will be introduced. - Carbon pricing will be implemented only in regions that have already introduced or have plans to introduce this method.	
Global Changes in Energy Supply and Demand	- Final energy consumption will decrease in the future due to ongoing energy conservation efforts and improvements in energy consumption efficiency. - Conversely, significant progress in electrification rates will result in a steady increase in electricity demand.	- Final energy consumption will continue to increase into the future, following existing trends. - Electricity demand will increase accordingly, but electrification rates will not show significant growth and will remain below the levels of the 1.5°C scenario.	
	- Renewable energy introduction will progress rapidly, replacing fossil fuels as the world's primary energy source by the mid-2030s. - As a result, demand for fossil fuels like natural gas will decline rapidly.	- Renewable energy will be introduced at a moderate pace, with fossil fuels continuing to function as the world's primary energy source in the long term. - Demand for fossil fuels, including natural gas, will largely level off.	
	Technological innovations to curb greenhouse gas emissions will lead to a significant increase in the production of new low-carbon fuels such as hydrogen and ammonia.	Development and introduction of new low-carbon fuels such as hydrogen and ammonia will be limited.	
Global Climate Changes*	- Global average temperature increase will stabilize at around 1.5°C - The frequency and intensity of extreme weather events such as heavy rainfall, high temperatures, and droughts will marginally increase worldwide. - The average sea level worldwide will rise by 0.4–0.7 meters by the end of the century, but the long-term rise will be more limited compared to the 4°C scenario.	- The global average temperature will rise by around 4°C by the end of the century. - The frequency and intensity of extreme weather events such as heavy rainfall, high temperatures, and droughts will increase significantly worldwide. - The average sea level worldwide will rise 0.8–1.2 meters by the end of the century. Given the uncertainty of ice sheet melting processes, water levels could reasonably rise at a significantly faster pace than in existing trends.	

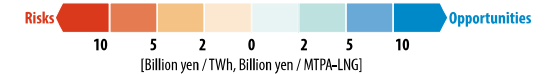
*Numerical values in the scenario descriptions and graphs represent the deviation from values expected prior to the Industrial Revolution. Extreme refers to weather events with a probability of occurring once in 10 years.

Climate-related Disclosures (Response to TCFD Recommendations, etc.)

Assessment of Impact on Our Business

We listed climate change-related risks and opportunities for our business based on the scenarios on the previous page. We conducted a sensitivity analysis of the potential financial impact on JERA regarding the major risk and opportunity factors identified. The legend on the right side is classified into four colors that indicate the financial impact per unit of activity over the short-term (through 2025), medium-term (through 2030), and long-term (through 2050) periods for each risk and opportunity.

We will work to reduce the risks and seize the opportunities through JERA Zero CO₂ Emissions 2050 as well as other efforts and measures.



Risk/Opportunity Categories Projected Changes in Business Circumstances	Impact on JERA	Analysis of Potential Financial Impact Sensitivity on JERA						JERA's Measures and Examples of Related Initiatives
		Method of Assessment	Corresponding Business	Unit	2025	2030	2050	
▼ 1.5°C scenario								
Policy and Regulatory Stricter Regulation of Fossil Fuel Use	Increased operating costs due to carbon pricing	Sensitivity of carbon cost increase per unit of thermal generation	Power Generation	Billion yen / TWh		Reducing Emissions by Promoting JERA Zero CO₂ Emissions 2050 - JERA Zero CO₂ Emissions 2050 → P.17 - JERA Zero CO₂ Emissions 2050 Roadmap for Its Business in Japan (Blueprint for Achieving Zero Emissions) → P.18 - Emission Indicators and Targets → P.48		
		Sensitivity of carbon cost increase per unit of LNG production	Fuel Upstream	Billion yen / MTPA-LNG		Recommendations and Involvement in Energy and Global Warming Policy Participation in the GX League → P.50		
	More efficient energy consumption through stricter energy conservation regulations	Sensitivity to decreases in operating costs per point of improvement of thermal power generation efficiency	Power Generation	Billion yen / TWh		More Efficient Energy Consumption Through Power Source Renewal - Promoting replacement of obsolete thermal power plants domestically with a total cost of exceeding 1 trillion yen (7.31 GW total) - Decommissioning of obsolete thermal power plants in operation for over 50 years (10.63 GW in total)		
Technology Changes in Energy Supply Structure Through the Development and Introduction of Non-fossil Energy Technologies	Reduced utilization rate of traditional thermal power sources due to an increase in low-carbon energy and grid diversification	Sensitivity to reduced sales due to lower amounts of thermal power generation	Power Generation	Billion yen / TWh		Reducing Power Plant Operation Costs to Improve Price Competitiveness for Power Sources - Improving O&M model efficiency using best practices from both shareholder companies - Streamlining through procurement and outsourcing of materials and equipment utilizing economies of scale - Optimization of power plant business and operation by promoting digital power plants → P.36, P.37		
	Expansion of business opportunities through development and lowered costs for hydrogen and ammonia fuel technology	Sensitivity to operation cost reduction by replacing coal with ammonia	Power Generation	Billion yen / TWh		Promoting the Development of Zero-Emissions Thermal Power Technology - Promotion of large-scale ammonia demonstration tests at Hekinan Thermal Power Station Unit 4 - Participation in the Green Innovation Fund Project, promoting demonstration tests for hydrogen power generation technology at LNG thermal power plants. - Use of hydrogen at Linden Gas Thermal Power Station Unit 6 (US)		
		Sensitivity to operation cost reduction by replacing LNG with hydrogen	Power Generation	Billion yen / TWh		Establishing Hydrogen and Ammonia Supply Chains Promoting collaboration with leading companies, both domestic and overseas, at each stage of the value chain → P.20		
	Expanded business opportunities provided by reduced technology costs for renewable energy and storage batteries	Sensitivity to operation cost reduction by lowering construction and operation maintenance costs for offshore wind power	Power Generation	Billion yen / TWh		Promoting the Development of Renewable Energy Sources Centered on Offshore Wind Power - Development output target for renewable energy (FY2025 total): 5GW - Participation in Taiwan's Formosa Offshore Wind Farm projects → P.22 - Acquisition of major Belgian offshore wind power producer, Parkwind → P.21 - Acquisition of renewable energy power producers such as GPI Corporation → P.21		
		Sensitivity to operation cost reduction by lowering construction and operation maintenance costs for solar and onshore wind power	Power Generation	Billion yen / TWh		Supporting Adoption of Renewable Energy Through Storage Batteries - Development of a recycling process for electric vehicle lithium-ion batteries with low environmental impact - Construction of a large-capacity Sweep Energy Storage System using batteries reclaimed from electric vehicles → P.22		

Climate-related Disclosures (Response to TCFD Recommendations, etc.)



Risk/Opportunity Categories Projected Changes in Business Circumstances	Impact on JERA	Analysis of Potential Financial Impact Sensitivity on JERA						JERA's Measures and Examples of Related Initiatives
		Method of Assessment	Corresponding Business	Unit	2025	2030	2050	
▼1.5°C scenario								
Market and Services Increased Demand for Electricity Driven by Economic Growth and Electrification	Expanded opportunities to supply power	Sensitivity to increases in sales due to reduced volume of electricity sold	Power Generation	Billion yen / TWh				Acquisition of Business Opportunities via Appropriate Capital Investment Total CAPEX from FY2022 to FY2025: approx. 1.4 trillion yen (Approx. 1.2 trillion yen of growth investment) → P.25
Market and Services Transforming the Value of Energy	Decrease in fuel sales and trading due to reduced fossil fuel prices	Sensitivity to the decrease in LNG sales due to falling LNG prices	Fuel Upstream	Billions yen / MTPA-LNG				Maintenance of a Flexible and Competitive Fuel Procurement and Sales Portfolio - Promotion of fuel procurement that is highly stable, competitive, and flexible in operation, utilizing upstream interest and fuel transports on hand - Optimization of flexible procurement, resale, etc., through JERAGM (LNG spot procurement volume for FY2022: Approx. 700 MTPA) - Value maximization of the LNG procurement portfolio via the JERA LNG Portfolio Strategy
		Sensitivity to the decrease in LNG trading sales due to falling LNG prices	Transportation and Trading	Billions yen / MTPA-LNG				
	Increased customer demand for green products and services due to the rise in non-fossil value	Sensitivity to carbon costs avoided through green power production	Power Generation	Billion yen / TWh				Provision of Added Value Through Clean Energy Supply Platform - In collaboration with Japan Data Science Consortium Co. Ltd., jointly developing a photovoltaic power generation forecasting system - In collaboration with NEC Corporation, initiating a demonstration project for electricity market trading utilizing factors like demand response - In collaboration with Sustech Inc., launching a renewable energy aggregation business - Considering introduction of 24/7 Carbon-free Energy* to Toho Studios
		Sensitivity to carbon costs avoided through green fuel production	Fuel Upstream	Billions yen / MTPA-LNG				
Market Services and Reputation Growing Global Awareness of Climate Change	Financial constraints due to limited investment in and divestment from the fossil fuel business	Sensitivity to increased operating costs when the funding procurement cost for power generation businesses worsens by 1 point	Power Generation	Billion yen / TWh				Active Information Dissemination to Stakeholders - Appropriate information dissemination regarding zero-emissions initiatives - Complete renewal of the corporate website, launch of the JERA's ACTION brand website
	Expanded opportunities to invest in clean energy projects and utilize climate transition finance	Sensitivity to increased operating costs when the funding procurement cost for power generation businesses improves by 1 point	Power Generation	Billion yen / TWh				Diversification of Financing Methods - First issuance of transition bonds - Financing through transition-linked loans
▼4°C scenario								
Acute More frequent/severe natural disasters	Increased cost of disaster response	Sensitivity to increased operating costs from switching power sources due to facility shutdown and output constraints	Power Generation	Billion yen / TWh				System Reinforcement in the Event of Large-Scale Disaster - Establishment of emergency disaster countermeasure regulations and related manuals → P.74 - Implementation of periodic disaster drills → P.74 - Improvements to JERA's BCP and BCM → P.74
Chronic Chronic changes in climate patterns	Increased operational restrictions on facilities due to factors like drought							Business and Supply Chain Diversification - Promoting power source portfolio diversification through zero-emissions thermal power development and the expansion of renewable energy sources - Promoting diversification of procurement sources and business regions (Overseas power generation projects: over 30 projects in 10 countries; upstream investments: 6 projects in 2 countries; LNG procurement sources: 15 countries)

*Refers to any electricity source that does not emit CO₂ for 24 hours a day, 7 days a week—in other words, 365 days a year.

Climate-related Disclosures (Response to TCFD Recommendations, etc.)

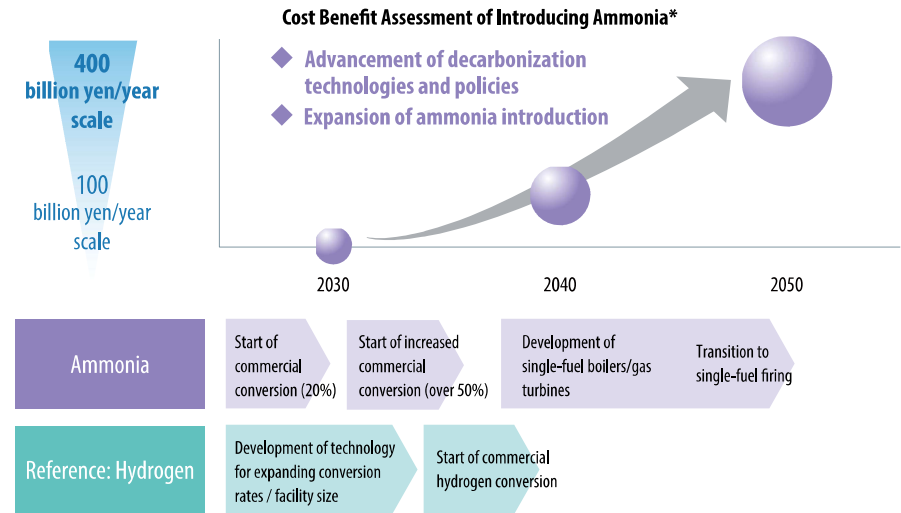
Assessment of Impact on Our Business: A Deep Dive into the 1.5°C Scenario

In light of the steady progress we have made in our business toward achieving JERA Zero CO₂ Emissions 2050 since announcing it in October 2020, and due to changes in business circumstances, we formulated a new long-term vision for 2035, unveiling a set of new environmental targets for achieving the new vision: JERA Environmental Commitment 2035. We will update the JERA Zero CO₂ Emissions 2050 Roadmap for JERA Business in Japan based on the new targets and present our updated plan for introducing hydrogen and ammonia conversion in Japan.

As with the previous deep dive into scenario analysis in line with the TCFD Recommendations, we analyzed the financial impact on JERA of [introducing ammonia to our power generation business ahead of technology development/using technology development to expedite our introduction of ammonia to our power generation business/introducing ammonia to our power generation business, which is driven by technological development], assuming the 1.5°C scenario and the aforementioned plan for introducing ammonia in Japan.

Our analysis revealed potential cost advantages on the order of 100 billion yen per year by 2040 and 400 billion yen per year by 2050 compared to the scenario in which we continue using coal.

We will continue to proactively develop large-scale fuel ammonia power generation technology and other decarbonization technologies in addition to devoting energy to ensuring the economic viability of the technologies so that they can help the world move away from carbon as a source of energy.



* All figures are calculated based on assumed parameters (e.g., reference scenarios). Actual cost-effectiveness may differ as business circumstances change.

The sizes of the circles in the graph illustrate ammonia amounts. Hydrogen is not included in the scope of this impact assessment. The plan for introducing hydrogen is provided here for reference.

Metrics and Targets

We regard JERA Zero CO₂ Emissions 2050 as a long-term objective, developing a comprehensive roadmap and establishing interim targets for CO₂ emissions in 2030 and 2035 to attain these goals. We continue to calculate and reevaluate actual results annually to manage our progress.

→ JERA Zero CO₂ Emissions 2050 Roadmap for Its Business in Japan: P.18

→ Non-Financial Data / Environmental Data: P.84-85

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

