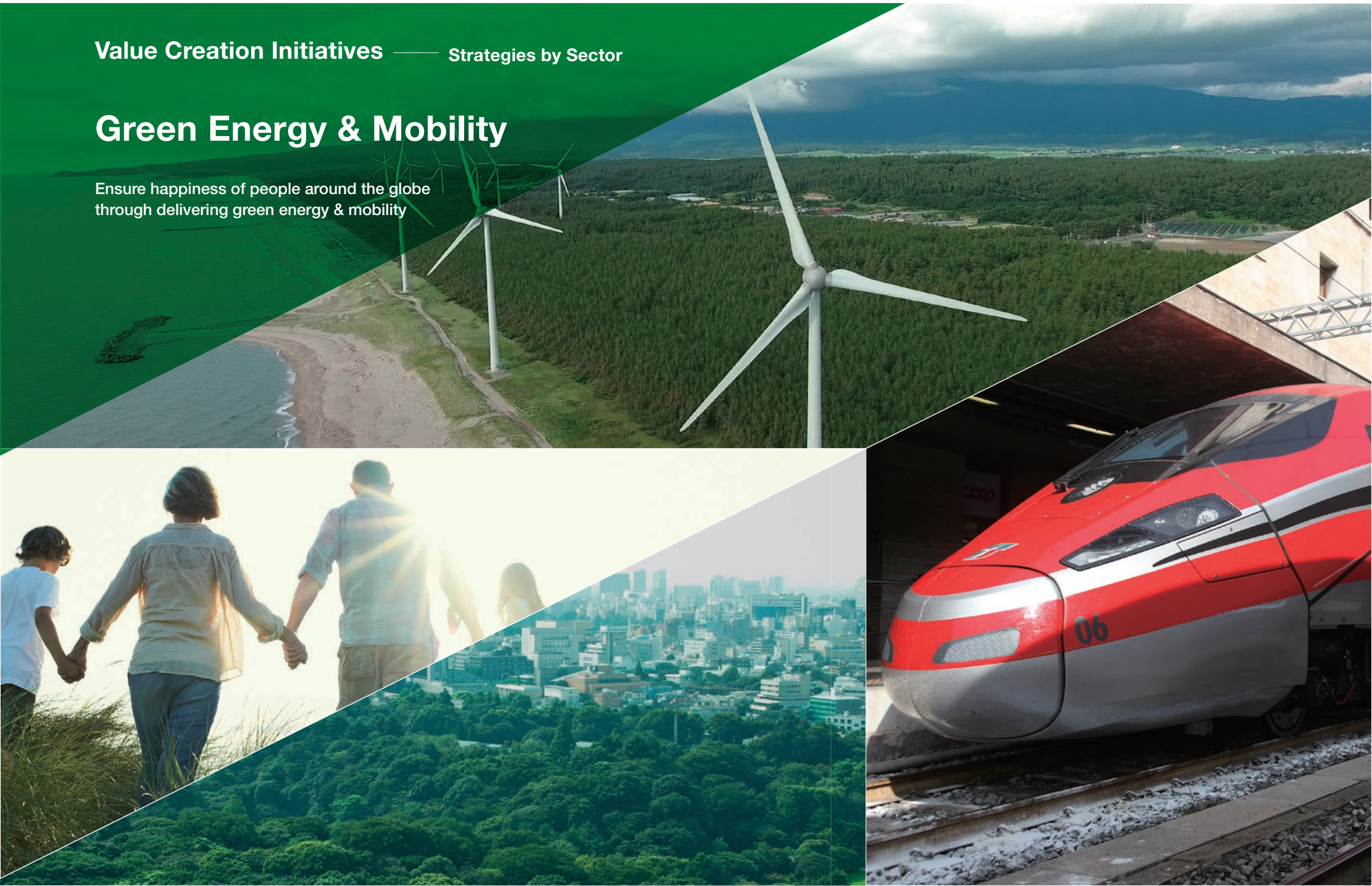


## Value Creation Initiatives — Strategies by Sector

# Green Energy & Mobility

Ensure happiness of people around the globe through delivering green energy & mobility





### Green Energy & Mobility Business Structure

#### Nuclear Energy BU 7%

Main products and services

- Nuclear power plant ABWR
- Fuel debris removal technologies
- Nuclear fuel cycle

#### Energy BU 9%

Main products and services

- Renewable energy solutions
- Distributed energy resources solutions
- Service solutions
- Power semiconductors

#### Power Grids BU 54%

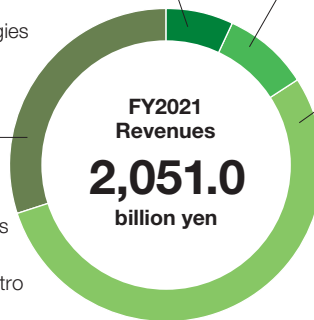
Main products and services

- Automation systems
- SCADA (Supervisory control and data acquisition) systems
- HVDC (High-voltage direct current)
- STATCOM (Static synchronous compensators)
- Smart charging systems
- GIS (Gas insulated switchgears)
- AIS (Air insulated switchgears)
- GCB (Generator circuit breakers)
- Transformers

#### Railway Systems BU 30%

Main products and services

- High-speed and intercity trains
- Commuter trains
- Tram, monorail, driverless metro
- Signaling systems
- Traffic management system
- Turnkey solutions
- Operation and maintenance
- MaaS (Mobility as a Service)
- Asset management



### Strengths

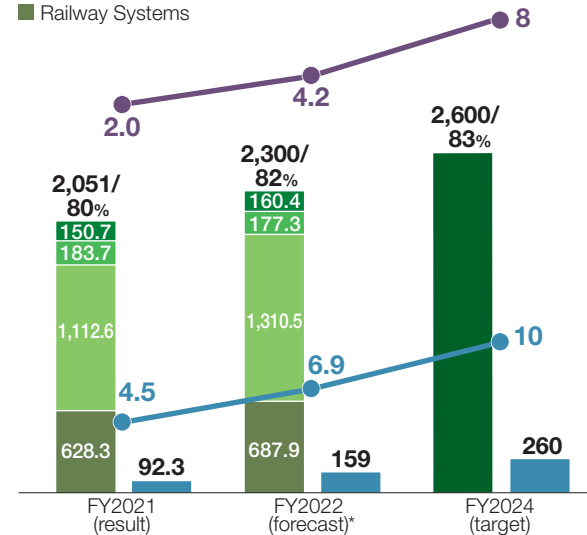
The emergence of climate change threats and increased geopolitical risks in recent years has led to huge investment in energy transition and electrification. The strength of this sector lies in its diverse products and solutions that contribute to those opportunities, which serves as a tailwind for our business. We will also leverage our strength to create new markets. For example, we expect high growth in development of mobility electrification for private car, public transportation (trains and buses) and mining industries, as well as managed services in microgrids expanding for diversification and decentralization of power supply systems.

Another strength of the sector is its robust business operations underpinned by a worldwide customer network and installed base. We will expand and strengthen this high profitable business by leveraging the installed base providing services with Lumada's digital technology for IT, OT, and products.

### Results and Forecasts

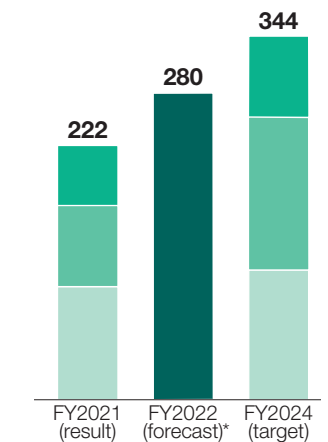
#### Revenues (billion yen) / Overseas Ratio (%)

- Nuclear Energy
- Energy
- Power Grids
- Railway Systems
- Adj. EBITA (billion yen)
- Adj. EBITA ratio (%)
- ROIC (%)



#### Lumada revenues (billion yen)

- System integration
- Connected products
- Managed services



\*Announced on July 29, 2022

### Mid-term Management Plan 2024: Vision

This sector has been established with the mission of "Create a sustainable society in which each individual can play an active role while protecting the global environment by using data and technology." Under the themes of energy transition, electrification and energy savings, we, as the Hitachi's core business sector for green value creation which is a pillar of our Mid-term Management Plan, will contribute to the realization of a carbon neutral society.

Through the acquisition of ABB's power grids business (now Hitachi Energy) and the Thales Ground Transportation System business, we will leverage our global installed base to accelerate our business transformation into a higher profitability model. We will also expand and implement Hitachi Energy's global operation system supported by digital technology across the entire Hitachi Group to support global growth.

## Green Energy & Mobility: Growth Strategy

### Business Environment

Under such challenges as climate change and the Ukraine crisis, energy transition and electrification have been precipitously advanced in global market. The rapid increase in global investment in decarbonization is a tailwind for this sector, which has a diverse range of products and solutions that can help deliver decarbonization to multiple market segments. In addition to conventional infrastructure projects, we expect new business opportunities such as electrification of buses, trains, and other forms of mobility, as well as microgrids. Also, business-to-service conversion and GX (green transformation) aimed at creating a carbon neutral society will emerge and grow around the world.

### Digital strategy

By leveraging Lumada to enhance this sector's large installed base around the world, we aim to evolve it into a recurring business to increase the ratio of high profitable services. We will also use Lumada to address the challenge of business transformation, for example, dedicated core businesses such as maintenance, to foster the transformation of our overall business portfolio. In high growth segments, such as mobility electrification and microgrids, we will provide offerings combining IT, OT, and products as "One Hitachi." For example, we will further expand collaboration with Hitachi Vantara and GlobalLogic in the asset management business, including asset performance management (APM) and the use of digital technologies in eMobility and other fields.

### Green strategy

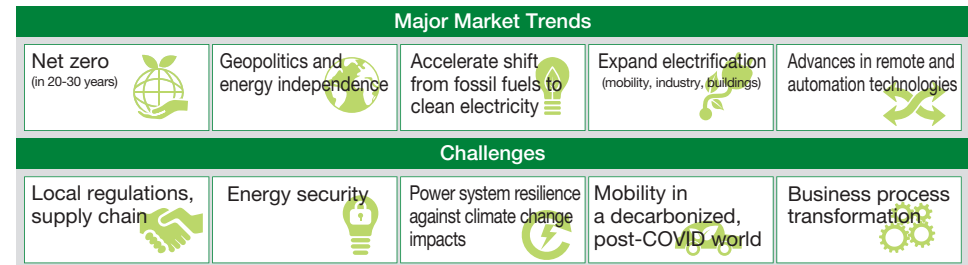
Hitachi aims to contribute to CO<sub>2</sub> reduction by 100 million metric tons annually by fiscal 2024 (monetary equivalent of approximately 1.1 trillion yen\*<sup>1</sup>), and Green Energy & Mobility Sector's contribution will be more than 80% mainly by Hitachi Energy. For example, Hitachi Energy's high-voltage direct current (HVDC) transmission system and digitalization will contribute to the power grids' resiliency and renewables integration. In the nuclear power segment, we will accelerate development of new technologies, such as small modular reactors (SMRs). Meanwhile, EFaaS (Energy & Facility Management as a Service), attractive solution for energy sector, improves operational efficiency through the integrated management of energy and facilities, and contributes to CO<sub>2</sub> reduction by accelerating the introduction of distributed energy resources solutions.

We will focus on R&D investments in areas such as energy transition, electrification, and energy savings and develop new products and services that match the market's decarbonization needs in order to further increase our market share. The sector plans to invest in power electronics and

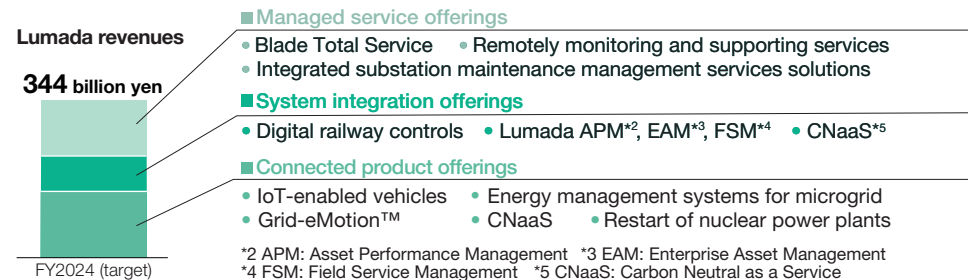
\*1 Carbon price: CO<sub>2</sub> reduction contribution from decarbonization solutions converted to monetary value, assuming a carbon price of ¥11,000/t-CO<sub>2</sub>

digital technologies, which are key to energy transition and electrification, during the period of the Mid-term Management Plan 2024. Using such technologies, we will also develop sustainable products and solutions and expand our service business in our installed base. Through these efforts, we will contribute to the achievement of a carbon neutral society.

### Green Energy & Mobility Sector: Market Trends and Challenges



### Leverage Lumada to Make the Social Innovation Business Highly Profitable



### Wide Range of Green Product Examples from the Green Energy & Mobility Sector



\*<sup>6</sup> Lifecycle CO<sub>2</sub> avoided emission in annual products shipped (base year FY2013)

## Energy Business

### Market Environment

Energy transitions targeting a decarbonized society are accelerating on a global basis. We also see progress in grid restructuring, including the shift to distributed energy resources, virtual power plants (VPPs), and next-generation transmission networks, in line with the increasing introduction of offshore wind power and other forms of renewable energy. In particular, demand related to digitalization, such as predictive maintenance, distributed energy resources, and grid and operational optimization, continues to grow at a high rate. There is also growing momentum to reevaluate nuclear power in order to achieve zero emissions by 2050.

Japan is also accelerating its energy transition, and the government has set a policy to increase the ratio of renewable energy to 36%–38% by 2030. Its plan also calls for the development of long-distance direct current transmission lines to transmit electricity from offshore wind and other renewable energy sources to urban areas, as well as to consider the use of hydrogen. The domestic market is expected to continue growing against the backdrop of large-scale integration of renewable energy, energy management such as grids, increasing data centers and the shift to electric vehicles (EVs), natural disaster countermeasures, and the restart of nuclear power plants.

### Business Strategy (Power Grids BU)

The power grids market and related areas are expected to grow against the backdrop of increased electricity demand from industries, buildings and IT sectors, electric vehicles (EVs) and electrification of railroads and the need to modernize the power grid to address supply and demand complexities like the integration of renewable energy and rising adoption of EVs to help realize a net zero society. Through collaborative creation with customers and partners led by Hitachi Energy, the Power Grids BU has established itself as a global market and technology leader to support an accelerated energy transition and pursue a carbon neutral future.

Hitachi Energy, which accounts for the majority of the Power Grids BU, operates four businesses: Grid Automation, Grid Integration, High Voltage Products, and Transformers. It has a broad portfolio of products, systems, software, and services, which together with Hitachi and its Lumada value co-creation cycle offer a unique combination of an energy and digital platform for utilities, as well as for customers in a variety of sectors, including industries, transportation, buildings, data centers, and cities. Sustainable products and systems, power electronics and digital solutions are being deployed to build the foundation for a system of systems and enabling the energy transition. Solutions such as high-voltage direct current (HVDC) technology play an important role in integration of renewables, long-distance power transmission, and interconnection of power grids across countries and continents.

As an increasing trend towards cross-sector integration, Hitachi Energy has developed innovative technologies like Grid-eMotion™—a flash-charging system for electric buses and commercial fleets supporting the electrification of the transportation sector. Another example is the EconIQ™ portfolio of environmentally efficient solutions that reduce environmental impact. In Japan, we will continue to introduce appropriate Hitachi Energy solutions to serve customer requirements.

In addition to continuously strengthening its power grids core business, the Power Grids BU aims to advance a sustainable energy future for all and achieve profitable and sustainable growth by doubling its digital and services businesses, and expanding its business at the grid edge of the energy system. The company is committed to innovation through synergies, partnerships, and pursuing organic and inorganic growth; the Power Grids BU will continue to strengthen its contribution as a partner, across the customer's lifecycle—supporting planning, building, operations and maintenance. Especially, in the Mid-term Management Plan 2024, Hitachi Energy aims at a 4%–6% CAGR annual revenue growth ahead of market, and to increase adjusted EBITA to 8%–12%.

By combining Hitachi's digital technology with Hitachi Energy's global top-level power grids business, the Power Grids BU will take advantage of its unique strengths with both energy and digital platforms to provide solutions for energy transition. We will also realize profitable and sustainable growth by placing Lumada's new value co-creation cycle at the core.

### FY2021 Performance

#### NordLink—the interconnection linking Germany and Norway's power markets and enabling access to renewable energy

Hitachi Energy has delivered one of the world's longest and most powerful HVDC interconnectors (NordLink) to a consortium owned by Statnett (Norway's national power transmission and distribution company), TenneT (Germany's national power transmission and distribution company), and the state-owned German development bank, KfW.

The NordLink enables exchange of renewable energy by connecting wind and solar power from Germany and hydro power from Norway, so that both countries can use their renewable resources more efficiently. Through the 623 km long, 1,400 MW HVDC interconnection, it is possible to provide enough electricity to meet the needs of 3.6 million German households<sup>X</sup>, which is equivalent to the total population of Berlin, Germany.

Hitachi Energy was responsible for the design, engineering and supply of two HVDC converter systems in southern Norway and northern Germany.



## Business Strategy (Energy BU)

The Energy BU will focus investments and resources on green and service businesses, aiming to become a business entity that contributes to decarbonization and carbon neutrality.

We will develop and promote core solutions and technologies to realize “Hitachi Carbon Neutrality 2030.” We will also integrate technologies mainly in the three key fields of “renewable energy,” “energy management,” and “asset management” to deliver high-value-added solutions and wide-ranging services.

In the green business, we will leverage our expertise in wind power and other forms of renewable energy, as well as in distributed energy resources, hydrogen utilization, and power semiconductors, to generate growth. We will also promote next-generation microgrid demonstration models and create carbon neutral solutions that incorporate virtual power purchase agreements (PPAs).

In the power semiconductors business, we will develop core competencies such as low-loss and high-voltage technologies that contribute to decarbonization.

In the services business, we will enhance our digital service platforms and applications and develop data-driven services and other businesses using Lumada. We are shifting our emphasis from maintenance services to management services for energy, assets, and the like to address issues related to social infrastructure and production facilities in various industries.

### FY2021 Performance

#### One-stop service for wind power facilities that uses drones and AI for inspection, maintenance planning, and blade repairs

In 2022, Hitachi Power Solutions began offering a one-stop service for wind power facilities that uses drones and AI for inspection, maintenance planning, and blade repairs.

This advanced maintenance solution, which uses drones and AI, will lead the way in decarbonization because it facilitates stable operation of wind power facilities, with inspections taking one-third the downtime of conventional services. We aim to contribute widely to wind power generation projects in Japan, including offshore wind power generation facilities expected to be fully introduced in the late 2020s.



## Business Strategy (Nuclear Energy BU)

Leveraging its advanced technological capabilities and abundant knowledge, the Nuclear Energy BU is working to further improve the safety of nuclear power, which contributes to decarbonization and plays a role in energy supply stability as a base-load power source.

Specifically, we support the restart of nuclear power plants in Japan by ensuring that safety measures are taken in accordance with new regulatory standards set by the government. With a view to increasing plant value after restart, we are introducing a management system that utilizes digital technology while working to improve capacity utilization.

To foster the steady decommissioning of the Fukushima Daiichi Nuclear Power Station, we are developing technologies for fuel debris removal and using underwater remote-controlled robots with cameras to investigate the inside of reactor containment vessels. We will continue supporting the decommissioning of this power plant through the development of such technologies.

In the area of small modular reactors (SMRs), which hold promise as innovative nuclear reactors, we are developing the BWRX-300 together with our partner, GE Hitachi Nuclear Energy (GEH). This reactor uses boiling water reactor (BWR) technology, for which we have extensive experience in construction and operation. Our aim is to reduce construction costs through downsizing while ensuring world-class safety standards.

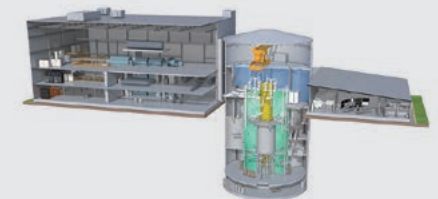
Hitachi will contribute to stable energy supplies and help realize a decarbonized global society through the restart of nuclear power plants and the revitalization of Fukushima in Japan, as well as deployment of the BWRX-300 in collaboration with GEH overseas.

### FY2021 Performance

#### BWRX-300

Under joint development in the United States and Japan, the BWRX-300 is a compact, next-generation reactor with an innovative safety system that combines high levels of safety and economic efficiency.

A Canadian power company has already selected BWRX-300 as its reactor model and is preparing to apply for permits and approvals for its construction in Canada. Other countries, including the United States, Poland, and Sweden, are also conducting evaluations and studies based on the assumption that the BWRX-300 will be introduced.





## Mobility Business

### Market Environment

Despite the ongoing impact of COVID-19 in fiscal 2021, lockdown restrictions were eased compared to fiscal 2020 and demand gradually recovered, mainly in Asia and Europe. Although the long-term impacts of the pandemic on the rail market are still not fully understood, railway demand is recovering and national governments around the world remain committed to investing in public transportation, where the “Living with COVID-19” lifestyle has taken root.

Railways, which are able to move numerous passengers at the same time consuming less energy, are attracting attention for their connection to reduced CO<sub>2</sub> emissions, and going forward, we believe investment in railways will continue over the long term as a solution supporting society, the environment and the economy in countries throughout the world that are promoting decarbonization. In the rail market, where automation, predictive maintenance and other digitalization initiatives are under way, we expect to see an increase in Smart Mobility and Mobility as a Service (MaaS) solutions that provide travelers with more seamless journeys when utilizing multiple transportation systems, including railways and buses.

### Business Strategy (Railway Systems Business Unit)

Despite challenging market conditions caused by COVID-19, revenue expanded on steady orders in the Railway Systems BU in fiscal 2021.

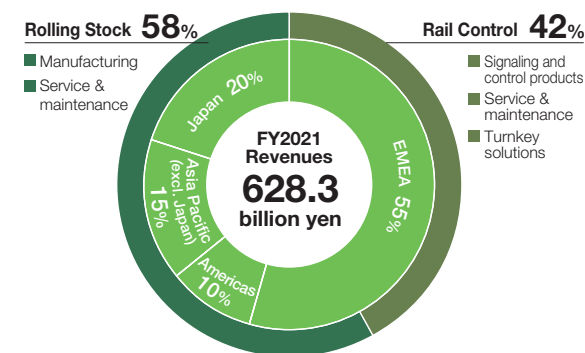
In the rolling stock business, orders for projects with attractive long-term service agreements are on the rise. Specific achievements include an order to build and maintain next-generation high-speed trains for the “High Speed Two” high-speed railway project in the UK, and the commencement of a 30-year long-term high-speed railway rolling stock maintenance agreement with ILSA in Spain. In the United States, the strategic decision was made to construct a new assembly plant for rolling stock the Washington, D.C., metropolitan area. This plant will enable Hitachi to meet a wide range of demands in the North American rail market.

Hitachi also announced that it will acquire the Ground Transportation Systems business from Thales. Hitachi’s rolling stock and other signaling and services-related businesses currently have a sales ratio of 6:4. With the acquisition from Thales, the strategy is to increase the ratio of the signaling and service businesses, which are considered to be more profitable. It is also geographically advantageous, enabling the development of new important markets such as Germany, Canada and Singapore. By combining the cutting-edge technologies possessed by Thales’ signaling and services-related businesses with the digital engineering capabilities of Hitachi’s Lumada and GlobalLogic, we will establish a foothold as a major player in the Smart Mobility and MaaS business models.

We are also accelerating technological developments to reduce CO<sub>2</sub> emissions. We aim to reduce fuel consumption by 20% or more with storage battery hybrid railcars introduced on

intercity railways in the UK. In Florence, Italy, we successfully conducted the first test operation of a storage battery-powered tram, and are making steady progress toward the global expansion of rolling stock equipped with storage batteries. We are also working with JR East and Toyota Motor Corporation to develop environmentally friendly hybrid vehicles using hydrogen as an energy source.

In transforming our business from hardware to “services” and increasing investments in products facilitating a sustainable future, we aim to achieve revenue of one trillion yen and an adjusted operating income ratio in the double digits by fiscal 2026.



### Smart Mobility Example Using Lumada

#### New Lumada Smart Mobility services launched in Genoa, Italy

In July 2022, Hitachi Rail announced the launch of Lumada Intelligent Mobility Management, a new suite of smart mobility solutions for cities, transport operators and passengers. The suite includes powerful tech for passengers and transport operators alike—connecting smart ticketing, traffic flow management and e-charging through a common analytics platform.

In the launch program, in Genoa, Italy, the new mobile app allows passengers to seamlessly access every mode of public transport in a city “hands-free” by registering the passenger’s phone as it connects to the network of more than 7,000 Bluetooth sensors on buses, trains, private hire e-vehicles and even a cable car. The cheapest possible fare is automatically calculated at the end of each day based on the passenger’s actual usage—and without needing to purchase a ticket.

For transport authorities, the new suite of smart mobility software empowers operators with a “digital twin” of the entire transportation network, giving real-time visibility of passenger and multi-modal transport flows around any city. By offering “as a service” business models to customers for these services, Hitachi Rail aims to make it easier than ever for cities, operators and passengers to accelerate the transformation to more sustainable transportation.

