# **Environment**



Through our initiatives toward Environmental Vision 2050, we will promote decarbonization and the transition to a circular economy, and contribute to the creation of a sustainable society.

Takashi Obinata

Managing Executive Officer, Corporate General Manager, Production & Procurement Group

In recent years, climate change has had a variety of impacts at global scale. The frequent occurrence of natural disasters such as torrential rains and heat waves as well as their impacts on ecosystems have become a threat that cannot be overlooked in nature and the social economy surrounding us. Furthermore, as a result of past mass consumption and mass disposal activities, a global environmental crisis is progressing, including the loss of biodiversity, pollution, and resource depletion. To address these problems, it is necessary to accelerate initiatives for decarbonization and for the transition to a circular economy, and the role that we as a company must play is becoming increasingly important.

Under the Fuji Electric Basic Environmental Protection Policy, we have positioned global environmental protection as an important issue for management, and we formulated Environmental Vision 2050 in fiscal 2019. In fiscal 2022, we revised our fiscal 2030 greenhouse gas emissions reduction target to align with the 1.5°C level for temperature rise set by the Paris Agreement, and in fiscal 2024, we established promotion of a circular economy as a Fiscal 2030 Target. The results of our fiscal 2024 periodic review of our Fiscal 2030 Targets (environmental KPIs), which was based on our current medium-term management plan, confirmed that we are expected to be able to achieve each target and that major initiatives are progressing as planned.

Future issues include the promotion of specific initiatives to transition to a circular economy. We will continue to shift to environmentally friendly products that comply with the EU Ecodesign Regulation, and we aim to achieve zero emissions, which will minimize the environmental impact throughout the supply chain.

Furthermore, we will prepare to disclose information appropriately in accordance with nature-related information disclosure schemes (TNFD) and the newly published Japanese sustainability disclosure standards (SSBJ).

We will continue to contribute to the creation of a sustainable society by utilizing the technologies we have developed in the energy and environmental fields.

#### **Fuji Electric Basic Environmental Protection Policy**

- Offering products and technologies that contribute to the global environmental protection
- 2. Reduction of environmental burden throughout product life cycles
- 3. Reduction of environmental burden in business activities
- 4. Compliance with laws, regulations and standards
- 5. Establishment of environment management systems and continuous improvements of the systems
- Improvement of employees' environmental awareness and social contribution
- 7. Promotion of communication

#### **Environmental Vision 2050**

We aim to contribute to the achievement of a decarbonized society, a recycling-oriented society, and a society that is in harmony with nature by expanding the use of Fuji Electric's movative clean energy technologies and energy-saving products

Achieve a Decarbonized Society	Target carbon neutrality across the supply chain	
Achieve a Recycling- Oriented Society	Promote green supply chains to reduce the environmental impact to zero throughout the entire life cycle	
Achieve a Society That is in Harmony with Nature	Aim for zero impact on the ecosystem through corporate activities that contribute to biodiversity	

#### Fiscal 2030 Target

We aim to achieve the following goals in order to limit the temperature increase to 1.5°C above pre-industrial levels.

Greenhouse gas emissions throughout the supply chain (Scope 1+2+3): Reduction of over 46% (compared to FY2019)

Greenhouse gas emissions through production (Scope 1+2): Reduction of over 46% (compared to FY2019)\*

Contribution to CO<sub>2</sub> reduction in a society through our products:

Over 59 million tons/year

\* Reduction of over 54% compared to FY2013

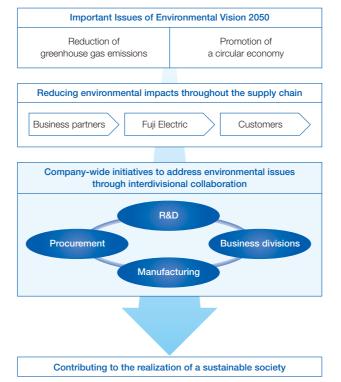
We will promote a circular economy while complying with environmental regulations around the world.

Transitioning to environmentally friendly products that comply with ecological design regulations

Final waste disposal rate (including plastic waste) less than 0.5%

# **Reducing Environmental Impacts Throughout the Supply Chain**

In its Environmental Vision 2050, Fuji Electric has positioned the reduction of greenhouse gas emissions and the promotion of a circular economy as important issues, and the company is working to achieve this environmental vision from a medium-to long-term perspective in order to solve challenges common to all its business activities, including in the R&D division, procurement division, and various factories.



#### **R&D** Initiatives

We are carrying out research and development aimed at creating new products that meet new needs related to green transformation (GX), and we are taking on the challenge of acquiring new technologies to reduce CO<sub>2</sub> in a society through our products in areas such as fuel conversion to hydrogen and ammonia, CO<sub>2</sub> recovery, and the electrification of heat processes.

Regarding the circular economy, we are carrying out development of technologies to reduce our environmental impact, such as evaluation and application technologies for recycled materials, in response to international regulatory trends, as well as creating new products to realize new business models. In addition, by participating in rulemaking activities for standards and regulations, we aim to harmonize efforts to reduce environmental impacts with economic activities.

Furthermore, we are formulating a GX strategy and roadmap to serve as guidelines for these activities.

# **Procurement Initiatives**

In collaboration with our business partners, we are promoting the construction of a green supply chain.

Among our activities to reduce greenhouse gas emissions throughout the supply chain, we are currently calculating each business partner's greenhouse gas emissions for procured goods. For business partners with high emissions, we will

identify collaborative items for reduction through interviews and formulate action plans. Meanwhile, to calculate the carbon footprint (CFP)\*1 on a per-material basis, we have formulated the Fuji Electric CFP Procurement Guidelines, are deepening business partners' understandings by holding study sessions for them, and are collecting calculation data.

In addition, regarding the chemical substances used in our products, we are promoting environmental impact reduction by requesting that our business partners comply with the Fuji Electric Green Procurement Guidelines.

\*1 CFP: A system to indicate the amount of greenhouse gas emissions in a product's lifecycle.

# **Manufacturing Initiatives**

To achieve the Fiscal 2030 Target (a reduction of over 46% from fiscal 2019) for greenhouse gas emissions through production (Scopes 1+2), we are reducing environmental impacts by switching from greenhouse gases to electrification (renewable energy) through innovation in production technologies, reforming manufacturing processes, improving production efficiency, optimizing facility energy control, and upgrading to energy-efficient equipment. In reforming manufacturing processes, we will promote the development of underlying technologies such as those for lower-temperature operation and electrification of fuel-consuming equipment used in painting processes, including drying and baking. To improve production efficiency, we will promote DFM\*2, which achieves manufacturing efficiency from the design stage, and aim to expand the production volume per hour. We will also achieve energy savings by monitoring and optimizing equipment operation. At our factories, we are systematically promoting the installation of solar power generation equipment and are expanding renewable electricity procurement to advance planned initiatives to achieve our goals.

Regarding the promotion of a circular economy, we will reduce our environmental impacts by improving material yields, promoting reuse, aiming for zero emissions to minimize waste and its amount sent to landfills, and managing and reducing use of chemical substances.

 $^{\star}2$  DFM (Design for manufacturing): Designing for ease of manufacturing.

#### **Business and Product Initiatives**

We contribute to society's  $CO_2$  emissions reduction through our environmentally friendly products. For inverters, a representative contributing product, we participated in a verification test by the Japan Electrical Manufacturers' Association to visualize the actual amount of  $CO_2$  emission reduction. By controlling motor torque and rotation speed, we reduced energy use and visualized the resulting reduction effect on  $CO_2$  emissions (Scope 3). Through this initiative, we expect to contribute to more effective  $CO_2$  emissions reduction measures for companies and to the decarbonization of the entire industrial sector.

Regarding the promotion of a circular economy, our R&D, manufacturing, and business divisions will collaborate to advance the transition to environmentally friendly products that comply with ecological design regulations and CFP.

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# **Initiatives to Achieve a Decarbonized Society**

#### Fiscal 2024 Results and Progress

Environmental Vision Fiscal 2030 Indicators		FY2023	FY2030			
		Result	Target	Result	Measures	Target
Greenhouse gas emissions throughout the supply chain (Scope 1+2+3) (million tons)		58	62	56	•Increase percentage of 7th-generation IGBTs	67 or less
	Reduction rate (compared to 2019)	-53%	-50%	-55%		Over -46%
Greenhouse gas emissions through production (Scope 1+2) (thousand tons)  Reduction rate (compared to 2019)		338	361	331	Expand installation of solar power generation equipment at the Company's production bases     Upgrade to energy-efficient equipment     Expand purchasing of renewable electricity	250 or less
		-25%	-20%	-27%	•Reduce non-CO <sub>2</sub> greenhouse gas emissions	Over -46%
Contribution to CO <sub>2</sub> reduction in a society through our products (thousand tons)		56,220	50,000	57,690	•Increase net sales of contributing products	Over 59,000

# **Major Initiatives in FY2024**

As part of our initiatives to reduce greenhouse gas emissions through production, we promoted installation of solar power generation equipment at our production bases as part of an effort underway since fiscal 2022. In fiscal 2024, we installed and began operating a total of approximately 5,300 kW at five bases in Japan and two bases overseas. We also engaged in cross-functional energy-saving initiatives at all factories and promoted systematic activities such as selecting the most energy-efficient equipment when replacing infrastructure and production facilities. At our semiconductor production

#### **Initiatives toward 2030**

We have verified the feasibility of our greenhouse gas reduction plan based on the projected production increases through fiscal 2030, in line with the FY2026 Medium-Term Management Plan.

We have confirmed that we are making progress toward achieving our targets for each indicator, including reducing greenhouse gas emissions throughout the supply chainwhich covers our own factory production activities (Scopes bases, which consume large amounts of electricity, we have signed three 20-year off-site PPA\*1 contracts to expand our purchasing of renewable electricity.

Regarding emissions during product use (Scope 3, Category 11), which account for approximately 95% of greenhouse gas emissions throughout the supply chain, we curbed emissions by increasing the ratio of high-efficiency products, such as 7th-generation IGBT power semiconductors.

\*1 Off-site PPA: A system for purchasing electricity via the power grid facilities from renewable energy generation facilities installed off-site

1+2) as well as material procurement, product shipment, and post-delivery emissions (Scope 3)—and contribution to CO<sub>2</sub> reduction in a society through our products.

Our Fiscal 2030 Target is a higher reduction goal than the decarbonization target set by the Japanese government (NDC\*2), and we will continue to advance our initiatives toward realizing a decarbonized society.

\*2 NDC (Nationally Determined Contributions): The contributions set by a country.

# Reduction of Greenhouse Gas Emissions throughout the Supply Chain (Scopes 1+2+3)

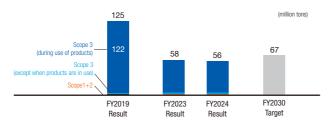
We calculate the greenhouse gas emissions generated in our supply chain based on the GHG Protocol, an international standard. For power semiconductors, Category 11 (emissions during product use), which accounts for the majority of Scope 3 greenhouse gas emissions, is expected to decrease due to expanded sales of 7th-generation IGBT modules with low power loss and the shift to silicon carbide (SiC) products. In Category 1 as well, which covers upstream emissions in the supply chain, we are carrying out activities to collaborate with and support our business partners. We aim to reduce greenhouse gas emissions throughout the supply chain to achieve the Fiscal 2030 Target (a reduction of over 46% from fiscal 2019, to 67 million tons or less).

Greenhouse Gas Emissions and Reductions throughout the Supply Chain

#### [Scope 3 Category 11] Emissions\* and main products (fiscal 2024)

Energy	0.8 million tons (thermal power, industrial substations, etc.)
Industry	10.0 million tons (low-voltage inverters, drive control, etc.)
Semiconductors	42.1 million tons
Food and Beverage Distribution	0.7 million tons (store distribution, etc.)

\* Emission volume = annual number of shipments × lifetime emissions



# Reduction of Greenhouse Gas Emissions through Production (Scope 1+2)

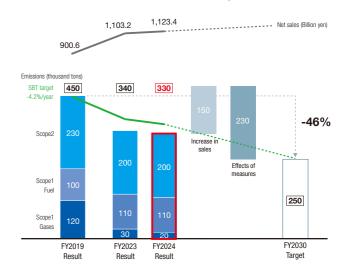
Based on the projected production increases centered on semiconductors, we are advancing the necessary measures to achieve a reduction of over 46% in greenhouse gas emissions through production (compared to fiscal 2019).

To expand our purchasing of renewable electricity, we are securing a stable supply through long-term contracts, and we aim to increase renewable electricity's share of total companywide electricity consumption\*3 from 9% in fiscal 2024 to 55% by fiscal 2030.

\*3 Electricity consumption: Amount of purchased electricity + Amount of solar power generated internally

Main Measures	Overview		
Expand installation of solar power generation equipment at the Company's production bases	Operations began at seven bases in Japan and overseas in FY2024; operations are scheduled to begin at three bases in Japan in FY2025		
Updating to energy-efficient equipment	Replace production facilities, air conditioning, and lighting equipment with the latest energy-saving models		
Expand purchasing of renewable electricity	Long-term contracts for renewable electricity		

Trends in Greenhouse Gas Emissions through Production

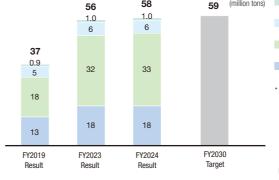


# Contribution to CO<sub>2</sub> Reduction in a Society through Our Products

Having defined our business domain as the energy and environmental fields, we began calculating the contribution to CO<sub>2</sub> reduction in a society through our products in fiscal 2009, using this as an indicator of our contribution to achieving carbon neutrality. Each year, we have expanded the range of contributing products, and their sales composition ratio reached 30% in fiscal 2024; the increase is primarily centered on inverters in the industry business and the clean energy field.

#### Contributions to CO₂ Reduction in a Society through Our Products and Main Contributing Products

(Calculated on a stock basis, targeting all products now in operation in society)



(million tons) Food and Beverage Distribution Store facilities and equipment (0.3), Vending machines (0.3) Semiconductors Industrial modules and discrete devices (5.7) Low-voltage inverters (30.5), Drive control (2.1), Rotating machines (0.3), FA components (0.1) Energy
Thermal and geothermal (14.1), Hydro (2.0), Solar (1.5), Facility power supplies (0.1)

\* According to the Guideline for Quantifying Greenhouse Gas Emission Reduction Contribution (Ministry of Economy, Trade and Industry, March 2018), the difference in power consumption between the case in which existing products continue to operate and the case in which products with superior environmental performance are introduced to replace them is converted into an amount of CO2 emissions. For products shipped during or after fiscal 2009 during the operation period, and for products newly under scope after the scope of calculation expansion in 2022 (such as drive control systems and ED&C component products), the amount of CO2 reduction is calculated as the amount of contribution if the product is operated for one year. CO2 emissions that can be reduced using the Company's products = (Emissions from existing products - Emissions from new products) × Number of units in operation during the current year

Plant systems in the Energy and Industry segments are excluded from calculation because operating conditions (load factor

#### Sales Composition Ratio of Contributing Products (Fiscal 2024 Result)

(Billion ven)

	Energy	Industry	Semiconductors	Food and Beverage Distribution	Total
Net sales of contributing products	38.3	44.4	186.8	63.9	333.4
Total net sales	354.3	400.0	236.8	111.5	1,123.4
Composition ratio	11%	11%	79%	57%	30%

#### **TOPICS**

# Expansion of GX Products in New Fields That Contribute to the Environment

While working to maintain and expand our existing businesses, we are also focusing on GX, digitalization, and our global business, and we will contribute to decarbonization by launching new products. Over the medium to long term, we will accelerate the development of environmentally friendly products with an eye to GX markets for new fields such as the hydrogen society, fuel conversion, and thermoelectricity. Through these initiatives, we will strive for further business expansion and environmental contribution.

# Main Products in Development (subject to change as they are currently under development)

Waste heat recovery ejector cooling systems



 CO<sub>2</sub> emissions: Reduction of up to 85% (when applied) to electronic computing equipment with a waste heat

Stationary fuel cell systems (solid polyme

Hydrogen society

- temperature of 45°C and a cooling temperature of 35°C)
- Application examples: Semiconductors, food, data centers
- CO<sub>2</sub> emissions: Reduction of up to 100% (for the pure hydrogen-type system)
- Application examples: Factories, ports, plants,

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# Cross-Functional Strategy Supporting Business Growth

# Initiatives to Achieve a Recycling-Oriented Society and a Society That is in Harmony with Nature

#### Fiscal 2024 Results and Progress

Fiscal 2030 indicators	FY2023	FY2023 FY2024				
FISCAI 2030 IIIUICAIOIS	Result	Target	Result	Key measures and activities	Target	
Final waste disposal rate* (%)	0.2	Less than 0.5	0.15	Reinforcement of waste sorting, mainly at overseas production bases, and development of waste disposal contractors	Less than	
(Reference) Of which, plastics in Japan	0.2	_	0.12	Improved by reinforcing waste sorting	0.5	
Water consumption per unit of sales (1,000 m³/100 million yen)	0.9	1.2 or less	0.9	Recycling at semiconductor factories	1.2 or less	
Volatile organic compounds (tons)	475	800 or less	510	Recovery rate improvement	800 or less	
Transition to environmentally friendly products	_	_	_	Creation of internal guidelines, preparations to support DPP/CFP	_	

<sup>\*</sup> Final waste disposal rate: Final waste disposal ÷ Total waste

#### **Major Initiatives in FY2024**

Regulations for the transition to a circular economy are advancing, particularly in Europe, and companies are required to implement initiatives to reduce their environmental impacts throughout their supply chains and to comply with information disclosure requirements. In fiscal 2024, as part of these efforts, we worked to create a framework and rules for transitioning to

environmentally friendly products.

In addition, we worked to reduce the amount of waste sent to landfills, particularly by strengthening sorting and waste disposal contractors at our overseas production bases, and have maintained a high standard with a ratio of 0.15%.

# **Initiatives toward FY2030**

We are preparing to transition to environmentally friendly products that meet the requirements of environmental regulations in Japan and overseas. In response to demands for per-product traceability disclosure, including resources and

environmental impacts, we are working to create a framework to support the calculation of carbon footprints (CFP) and the EU Digital Product Passport (DPP)\*.

\* Digital Product Passport (DPP): A mechanism to provide information on topics such as product sustainability in the form of an electronic record

# **Transitioning to Environmentally Friendly Products**

To realize "manufacturing with no environmental impacts throughout the entire lifecycle," we are reviewing the requirements for environmentally friendly products. In product development and design, in addition to conventional requirements such as energy savings and resource savings, we will add requirements such as recyclability, CFP disclosure, waste reduction, and support for biodiversity.

# Diagram of Environmentally Friendly Products



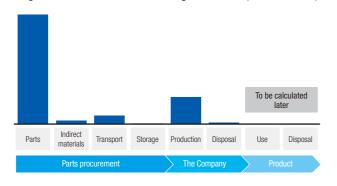
#### Addressing Carbon Footprint (CFP)

We are implementing initiatives to quantify greenhouse gas emissions over product life cycles as the amount of CO<sub>2</sub> emissions

In fiscal 2024, we conducted trial calculations from procurement to production for two representative models (magnetic switches and vending machines) and identified challenges for future calculations.

In fiscal 2025, we will expand the range of models subject to calculation to include low-voltage inverters and semiconductors, and we will work to collect primary data in collaboration with our business partners.

#### Diagram of CFP Calculation for a Magnetic Switch (CO<sub>2</sub> emissions)



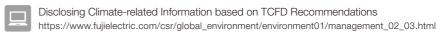
# Information Disclosure Based on the TCFD and TNFD Recommendations

Since expressing our support for the Task Force on Climaterelated Financial Disclosures (TCFD) in June 2020, we have reflected the results of our analysis of risks and opportunities arising from climate change in our business strategies and have updated our information disclosures based on the TCFD recommendations. In fiscal 2024, based on the framework of the Taskforce on Nature-related Financial Disclosures (TNFD), we newly evaluated the degree to which our manufacturing bases depend on natural capital, the impact such bases have on natural capital, and risks and opportunities for our business, following the LEAP approach recommended by the TNFD.

		Information Disclosure Based on the TCFD and TNFD Recommendations (Excerpts)				
Governance	Important environmental issues, including climate change and natural capital, are discussed by Executive Officers at the Sustainability Committee ar reported to the Executive Committee and the Board of Directors.					
	The following are excerpts of the main evaluation results regarding our dependence on natural capital and impacts on climate change, as well as related risks and opportunities.					
	Process	Evaluation Results				
Strategy	Locate interface with nature	<ul> <li>44 Manufacturing Bases in Japan and Overseas&gt;</li> <li>Frequent and severe extreme weather events: Surveyed with Aqueduct*1, identified 3 bases in Japan and 3 bases overseas with high flood risks.</li> <li>Proximity to protected areas: Surveyed with IBAT*2, found 4 bases in Japan and 1 base overseas adjacent to protected areas. However, it was confirmed that all are implementing sufficient environmental management.</li> <li>Supply and purification of water resources: Surveyed with Aqueduct, confirmed bases overseas with high water stress risk (in India, China, Thailand, etc.). However, the water intake at these bases is not high.</li> <li>Supply Chain&gt;</li> <li>Frequent and severe extreme weather events: Ascertained flood risks for major suppliers; now promoting multi-sourcing of procurement.</li> </ul>				
	Evaluate dependencies and impacts      Greenhouse gas emissions: Currently reducing emissions to achieve the Fiscal 2030 Target, including strengthening emissions control production facilities (fuel-using equipment, etc.).      Supply and purification of water resources: Although semiconductor manufacturing bases have high dependence on water resource the risk is limited as all such bases have low water stress risk.      Pollution: At bases that use chemical substances, strict management, including installation of treatment equipment, limits the impacts surrounding area. In FY2024, volatile organic compound (VOC) emissions were halved compared to FY2019.					
	Assess risks and opportunities	Risk: Climate Change    Frequent and severe extreme weather events: Decreased earnings due to production impacts caused by disasters and increased response costs.   Greenhouse gas emissions: Increased costs associated with the decarbonization of production facilities (fuel-using equipment, etc.).   Risk: Natural Capital    Resource circulation: Increased response costs associated with stricter regulations on environmentally friendly product design (ecological design regulations, etc.).   Supply and purification of water resources: Delays in production processes that use large amounts of water and increased response costs due to a decrease in the amount of available water resources.   Water resource use/pollution: Diminished reputation due to adverse impacts on ecosystems from environmental impacts such as water use and pollution.   [Opportunity: Climate Change & Natural Capital]   Capturing new demand by developing energy-saving and energy-generating products and after-sales services.				
	Prepare to respond and report	Frequent and severe extreme weather events: Countermeasures have been implemented at manufacturing bases with high flood risks.     Greenhouse gas emissions: Total environmental investments and expenses have been revised to ¥24.0 billion (cumulative for FY2023–2030).				
Risk Management	Risks such as climate change and environmental pollution are systematically managed and handled in accordance with the Fuji Electric Risk Management Rules.					
Metrics and Targets	[Fiscal 2030 Target: Climate Change]  Greenhouse gas emissions through production (Scopes 1+2) : Reduction of over 46% (compared to FY2019)  [Fiscal 2030 Target: Natural Capital]  Water consumption per unit of sales : 1,200 m³/100 million yen /					

<sup>\*1</sup> Aqueduct: An evaluation tool developed by the World Resources Institute (WRI) that identifies global water risks based on operating bases' location information (latitude and longitude).

<sup>\*2</sup> IBAT: An evaluation tool for identifying biodiversity risks published jointly by the TNFD and the Integrated Biodiversity Assessment Tool (IBAT) Alliance







Disclosing Nature-related Information based on TNFD Recommendations https://www.fujielectric.com/csr/global\_environment/environment01/tnfd.html



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