

Reinforcement of climate change countermeasures

Social value targets		Fiscal 2024 targets	Fiscal 2030 targets	Fiscal 2050 targets
GHG emissions reduction (%) (vs. fiscal 2019)	Scope1+Scope2	20%	46%	—
	Renewable energy sourcing (%)	25%	50%	100%

Basic view

Climate change has caused a variety of environmental issues around the world in recent years. We believe businesses have an important role in fighting climate change. We will contribute to decarbonizing the society through various initiative by setting targets for greenhouse gas (GHG) emissions and renewable energy sourcing.

We recognize that climate change presents both risks of increased cost and disruption for our business as well as new opportunities for Murata to create value while meeting the needs of society. Murata aims to create a continuous cycle of social value and economic value and to contribute to the enrichment of society by promoting climate change countermeasures from the perspective of both its own environmental initiatives and its business activities, in accordance with the Murata Philosophy.

Murata's initiatives on climate change

(Year)	Key milestones in the world/Japan	Murata's initiatives
2009		<ul style="list-style-type: none"> Established the Global Warming Prevention Committee (currently Climate Change Committee)
2012		<ul style="list-style-type: none"> Started to install equipment for onsite solar power generation (in Japan and overseas)
2015	<ul style="list-style-type: none"> COP21 was held, and adopted the Paris Agreement 	<ul style="list-style-type: none"> Started to respond to the CDP climate change questionnaire
2018		<ul style="list-style-type: none"> Joined the Japan Climate Leaders' Partnership (JCLP) as an executive member
2019		<ul style="list-style-type: none"> Established the Climate Initiative Subcommittee
2020	<ul style="list-style-type: none"> Japan declared that it would realize carbon-neutrality by 2050 	<ul style="list-style-type: none"> Announced its support for the Task Force on Climate-related Financial Disclosures (TCFD) Joined RE100
2021	<ul style="list-style-type: none"> Japan set the interim targets for 2030 Revised the Plan for Global Warming Countermeasures Glasgow Climate Pact 	<ul style="list-style-type: none"> Established the Renewable Energy Subcommittee Kanazu Murata Manufacturing (Fukui Prefecture) became Murata's first plant to run on 100% renewable energy
2022	<ul style="list-style-type: none"> COP27 was held 	<ul style="list-style-type: none"> GHG emission reduction targets received SBT certification Established the Energy-saving Subcommittee Entered into a physical PPA with Chugoku Electric Entered into a virtual PPA with Mitsubishi Corporation
2023		<ul style="list-style-type: none"> Entered into a virtual PPA with Renova

Murata endorsed recommendations by the TCFD established by the Financial Stability Board (FSB). We will analyze risks and opportunities brought on by climate change and work to disclose information related to governance and strategies in accordance with the recommendations. Murata promotes its initiatives in

the four thematic areas specified in the TCFD recommendations, namely, governance, strategy, risk management, and metrics and targets.



Governance

Murata is strengthening its governance system for climate change measures. The Board of Directors has overall accountability for the management of all risks and opportunities, including climate change. Our President and the Executive

Vice President, who are Executive Directors of the Board, chair Murata's CSR Management Committee and Climate Change Committee, respectively, and are ultimately accountable for the oversight of our climate change measures.

Roles of the committees and activities in fiscal 2022

1 Climate Change Committee

The Climate Change Committee is responsible for governing Murata's overall strategies in response to climate change and monitoring the delivery of climate-related objectives across the Murata group. The committee reports its activity track records to the CSR Management Committee and the CSR Management Committee reports these results to the Board of Directors after thorough examination. The Board of Directors takes the risks and opportunities that occur due to climate change into consideration, and directs business plans and business strategies while considering related policies and current initiatives of Murata. In addition, internal award systems are established as part of our incentives, including a Presidential award system for initiatives to reduce CO₂ at each office. The Committee is composed of persons responsible for the Manufacturing Department, Research and Development Department, Environment Department, Sales Department, and other business divisions. Meetings are held two or more times per year to make decisions on matters for discussion proposed by the subcommittees. Meetings concerning specific themes are also held on an ad hoc basis as the themes occur.

Fiscal 2022 results

- Held meetings three times, examining the calculation of CFP to develop further energy-saving measures.
- Introduced systems that combined solar panels with storage batteries to domestic business sites.
- Discussed introduction of renewable energy through measures such as virtual PPAs.

2 Climate Initiatives Subcommittee

Led by the general manager of the Environment Department and composed of senior managers of relevant departments. In addition to deliberating the viability of climate related strategies, shares successful cases of cross-departmental cooperation and initiatives.

Fiscal 2022 results

- Probed deeply into analyses of opportunities and risks of transition scenarios according to TCFD, and reflected the results onto the disclosed information.
- Had dialogues and interviews with more than ten suppliers with an aim to reduce Scope 3 emissions.

3 Renewable Energy Subcommittee

Led by senior managers of the Battery Department, Business Development Department, Environment Department, etc. Since joining RE100, the subcommittee has deliberated initiatives to promote the introduction of renewable energy across the company such as the maximum introduction of solar power generation where possible at domestic business sites and long-term procurement contracts of power based on renewable energy.

Fiscal 2022 results

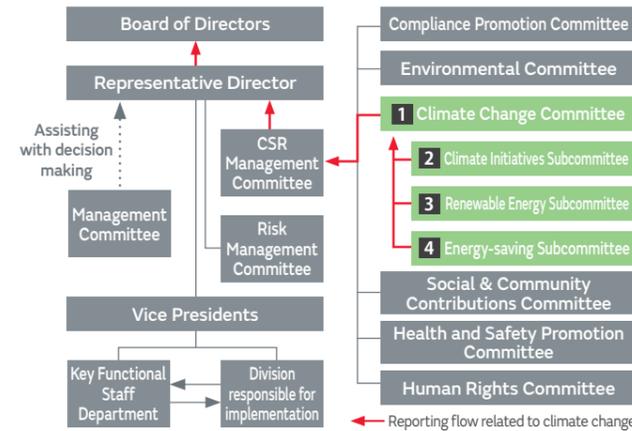
- Initiated introduction of systems that combined solar panels with storage batteries into four domestic business sites.
- Signed virtual PPAs and physical PPAs.

4 Energy-saving Subcommittee

Led by senior managers of Environment Department, and each division and business sites. The subcommittee promotes visualization of energy consumption and GHG emissions from product development to manufacturing as well as promotion of energy conservation measures.

Fiscal 2022 results

- Started deliberating CFP calculation to investigate further possibilities of GHG reduction in production processes as well as generating new energy conservation measures.
- Implemented approximately 570 individual energy-saving measures throughout the Murata Group (estimated reduction of 47,000 t-CO₂e per year).



Strategy

Murata identifies climate change countermeasures as critical issues for a manufacturing company and sets "reinforcement of climate change countermeasures" as one of the material issues in Vision2030 and Mid-term Direction 2024, and adopts KPI as a company-wide management target. By capturing climate change in both aspects of opportunity and risk, Murata seeks to practice corporate social responsibility and establish further competitiveness. Murata analyzed risks and opportunities in the two scenarios announced by IPCC*1 and IEA*2, namely "4°C or higher global average temperature increase" and "keeping the global average temperature increase to below 2°C (1.5°C or below in some parts), as agreed upon in the Paris Agreement," and re-acknowledged reinforcement of climate change countermeasures as a Murata priority issue. Specifically, Murata will continuously promote product development with competitiveness in terms of

smaller size, higher efficiency, and longer service life in order to meet the demand for high-efficiency parts required for changes in society, such as increase in renewable energy and energy conservation needs, the transition in automotive industry due to the shift to EVs, and further speed and capacity increase in information communications infrastructure. Murata also aims to contribute to a decarbonized society and explore new business opportunities by rolling out renewable energy and energy conservation measures externally, combining the solar power generation system introduced at Murata sites with its own storage batteries and energy management systems. The results of scenario analysis conducted in fiscal 2022 will be reflected in future management plan strategies to formulate concrete plans for action.

*1 Intergovernmental Panel on Climate Change (IPCC)

*2 International Energy Agency (IEA)

Climate change element	Item	Action policy	影響度	
Transition risk	Increase in decarbonized product needs Short to medium-term	Customer loss due to incapability to respond to decarbonization needs	<ul style="list-style-type: none"> Continuous product development with competitiveness in terms of smaller size, higher efficiency, and longer service life Reduction in CO₂ emissions in collaboration with suppliers Active introduction of renewable energy for the promotion of decarbonization in the manufacturing process 	High
	Increase in environmental awareness Short to medium-term	Deterioration of corporate value due to changes in investors' criteria	<ul style="list-style-type: none"> Continuous dialogues with investors Timely and appropriate disclosure of information through the TCFD framework or CDP Climate Change Committee monitors the progress of achievement of environment management targets 	Low
	Stricter energy conservation standards medium to long-term	Increase in plant building and operating costs	<ul style="list-style-type: none"> Decrease in cost burden through active use of energy conservation subsidies and preferential tax treatment Offsetting increased building costs by reducing running costs through energy conservation Active adoption of low-environmental burden building materials for constructing plants 	High
	Strained balance between mineral supply and demand medium to long-term	Increase in material procurement costs due to the strained balance between the supply of and demand for rare metals, etc.	<ul style="list-style-type: none"> Efforts to reduce the amount of materials used, associated with downsizing of products Recycling process efforts and exploration of alternatives 	High
	Introduction of carbon pricing medium to long-term	Increase in fuel and power costs	<ul style="list-style-type: none"> Energy conservation efforts at manufacturing sites Reduction in fossil fuel-derived power consumption due to active introduction of renewable energy New attempts at realizing alternative energy sources, such as using hydrogen Introduction of internal carbon pricing system in fiscal 2021 aimed at promoting investments in energy conservation and renewable energy measures 	Medium
	Instability in power supply due to active implementation of renewable energy medium to long-term	Loss of business opportunities due to insufficient BCP response	<ul style="list-style-type: none"> Enrichment of BCP at individual manufacturing sites Ensuring a backup system at key manufacturing sites 	Low
	Transition opportunity	Increase in the demand for high added-value, low-power consumption devices	<ul style="list-style-type: none"> Provision of the latest electronic parts that contribute to the evolution of hardware Continuous product development with competitiveness in terms of smaller size, higher efficiency, and longer service life 	High
Increase in decarbonized product needs Short to medium-term		Expansion of business opportunities due to supporting energy conservation and renewable energy needs	<ul style="list-style-type: none"> Contribution to a decarbonized society through battery and power supply business Promote stakeholders' understanding of the competitiveness of energy conservation and renewable energy efforts of Murata's products through Information disclosure based on TCFD and participation in environmental Initiatives (RE100, SBT, CDP responses) Creation of new businesses related to energy conservation and renewable energy Environmental monitoring using modules and sensors (in-house technologies) 	Medium
Progression of EV shift Short to medium-term		increase in the demand for electronic parts for automobiles (CASE) and automobile infrastructure	<ul style="list-style-type: none"> Acquisition of opportunities due to the expansion of the parts market associated with the shift to EVs Provision of new value including software solutions drawing on findings in the field of communications Exploration of business opportunities in the Out-Car area 	High
Progress in the social implementation of information infrastructure* Short to medium-term		Increase in the demand for electronic parts for high-speed, large-capacity communications and sensing society	<ul style="list-style-type: none"> Promotion of the development of products that can respond to the technical requirements for the upcoming 6G society Efforts for low power consumption and reduced loss Continuous development of sensing techniques and devices 	High
Energy conservation and improved efficiency in business operations Short to medium-term		Reduction in power costs through introducing renewable energy and storage battery facilities in plants and promoting energy conservation	<ul style="list-style-type: none"> Promotion of energy conservation efforts at manufacturing sites Reduction in costs to purchase non-fossil fuel-derived power by actively introducing renewable energy and storage batteries 	Low

1) Short-term: Within the next 3 years, Medium-term: Within the next 3 to 5 years, Long term: Within the next 5 to 10 years
 2) Impact levels: High: 20 billion+ JPY, Medium: 10 billion to 199 billion JPY, Low: Below 10 billion JPY
 * Elements that indirectly constitute opportunities

Physical risks and action policy

Timing: Medium-term: 2030 Long-term: 2050

Analysis target: 20 major manufacturing sites and offices primarily in Japan, China, and Southeast Asia (covering 80% based on the number of employees in the Group)

	2°C scenario		4°C scenario	
	Impact level	Overall	Impact level	Overall
Extreme typhoons and extreme heat	Medium to high level of risk	Over 25% increase in the risk of one or a group of these assets being affected by extreme climate hazards in 2050 from that in 2020	High to very high level of risk	Over 80% increase in the risk of one or a group of these assets being affected by extreme climate hazards in 2050 from that in 2020
Extreme drought and landslide	Medium level of risk		Medium level of risk	
Extreme rainfall flood and sea-level rise	Low level of risk		Low level of risk	
Extreme precipitation, storm surge, river flood or snowmelt	Not material	Value at Risk (VaR): estimated to be several hundred million JPY	Not material	Value at Risk (VaR): estimated to be approximately 1 billion JPY
Actions	<ul style="list-style-type: none"> Energy conservation: Initiatives to lower our demand for electricity, a major source of our CO₂ emissions Renewable energy: Introducing solar power generation facilities and purchase of renewable energy and renewable energy certificates Internal systems: An internal carbon pricing system was introduced in 2021 to align investment decision-making with Murata's commitment to CO₂ emissions reduction <p>Targets:</p> <ul style="list-style-type: none"> Joined RE100, committing to implementing 50% renewable energy by 2030 and 100% by 2050 Established Scope 1, 2, and 3 reduction targets in conformance with SBT standards 			

Value-at-risk (VaR)

- Reflects the estimated financial loss that can incur to the selected portfolio or asset in a year, with a certain probability, if all the estimated hazard events occur under the considered scenarios and period.
- VaR is estimated based on a macro view of the following two aspects:
 - Loss from physical damage to an asset: Evaluated with reference to historical events, asset types and cost of construction for the specific locations
 - Loss from business interruption: Evaluated based on macro-economic factors such as country GDP, population, land use (e.g. farming, commercial, residential, manufacturing, etc.), and urbanization
- The assessed VaR, in the range of few hundred million to 1 billion yen, is not expected to have a material impact on the company's financial position. As a reference, the potential financial loss would account for less than 0.4% of Murata's net profit in fiscal 2022. We aim to conduct analysis based on Murata-specific information in the future, and depending on the results, VaR may increase.
- Measures to minimize the impact of hazards on our operations will be deliberated according to the business continuity plan (BCP).

Risk management

CSR Management Committee regularly evaluates a wide range of material issues in social, environmental, and economic areas through a structured process. In the most recent materiality assessment, impact of climate change was identified as a critical risk and endorsed by the Board of Directors as an important issue that Murata should prioritize management oversight and actions. On a strategic level, the Climate Change Committee sets and provides oversight on Murata's climate change agenda, while continuously monitoring of evolving climate-related risks. In fiscal 2021, we mainly used physical scenario analysis to evaluate the potential risks and opportunities posed by future climate change and the resilience of our business strategy. In fiscal 2022, we performed an in-depth analysis of transition opportunities and risks. Other efforts include a full-scale introduction of the sustainability investment promotion system in fiscal 2022, and decarbonization initiatives with the perspective of discontinuous challenges, including the adoption of the internal carbon pricing system.

We have also embarked on Scope 3 emissions reduction initiatives, and in fiscal 2022, visited and interviewed more than ten suppliers. On the operational level, ISO 14001 is enforced

in our production facilities to drive continuous improvement while assessing environmental and climate change risks. Since 2018, Murata has also been capturing the latest information on global climate change in a timely manner through its regular membership with JCLP and has applied it to corporate efforts and actions. Risks arising from climate change are incorporated into company-wide enterprise risk register under the supervision of the Risk Management Committee. For example, guidelines for responding to severe weather conditions are provided in our Business Continuity Plan (BCP) to minimize business disruption. Our participation in industry associations, such as JCLP and JEITA, and global alliances, such as RE100, can help us gather insights into emerging risks and opportunities related to climate change. We also make policy recommendations through the global alliances. For the participation in an industry association or the review thereof, Murata periodically checks for any significant discrepancies or deviations in the missions of the industry association from Murata's aims and business activities. Withdrawal from an industry association will be considered if conformity with its missions is considered difficult.

Metrics and Targets

In order to contribute to global initiatives to limit the temperature increase to 1.5°C, Murata acquired SBT certification and joined RE100. While the business scale of Murata is expected to continue expanding, we consider energy-saving, renewable energy, and renewable energy certificates as three pillars in promoting our decarbonization initiatives

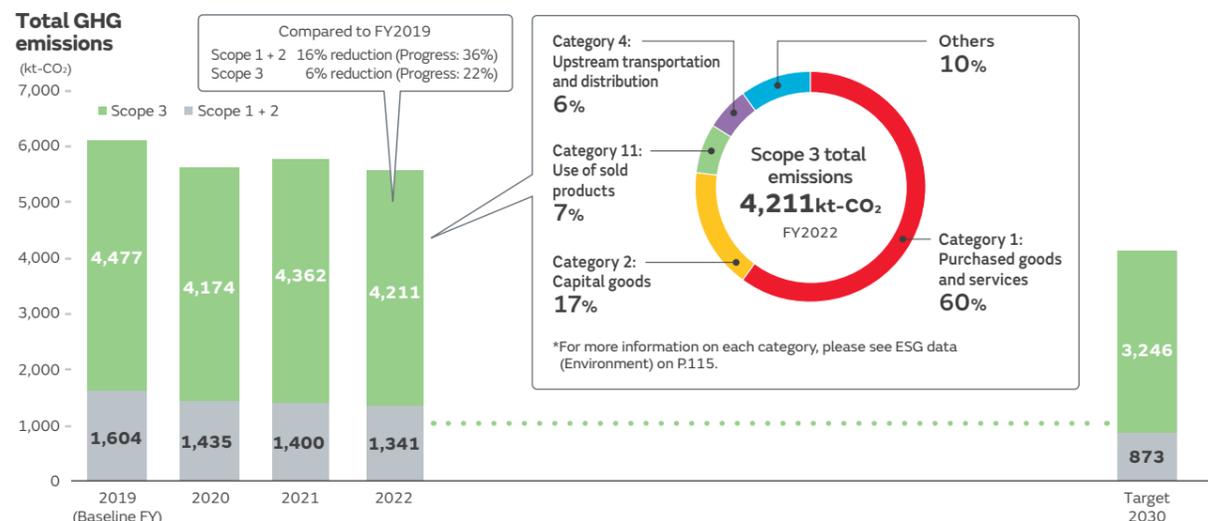
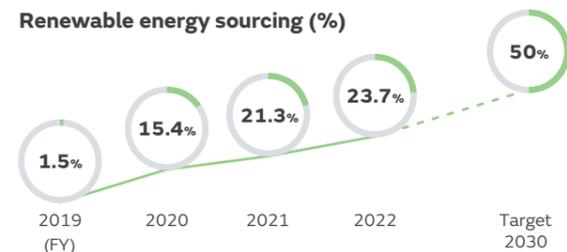
to reduce GHG emissions and expand the renewable energy sourcing. In addition, we strive to further strengthen cooperation with our business partners to consider measures for reducing GHG emissions in our entire supply chain, thereby accelerate decarbonization across the whole value chain.

Fiscal 2050

- Renewable energy sourcing: 100%

Fiscal 2030

- Renewable energy sourcing: 50%
- GHG emissions (reduction rate compared to fiscal 2019)
 - Scope 1 + Scope 2: 873 kt-CO₂e (46% reduction: 1.5°C target)
 - Scope 3: 3,246 kt-CO₂ (27.5% reduction: WB 2°C target)



Initiatives to counter climate change

Expanding renewable energy sourcing—On-site (within business sites)

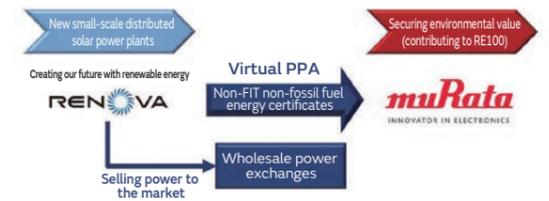
In fiscal 2022, Murata installed new on-site power generation facilities using solar panels and storage batteries into its four domestic plants. Combined with the one installed at Kanazu Murata Manufacturing (Fukui Prefecture) in fiscal 2021, the systems bring the cumulative annual CO₂ emissions reduction to a total of 2,265 tons. The system consists of large-scale solar panels and power storage unit that utilizes the strength of Murata's rechargeable battery technology, enabling it to operate stably over a long period. By analyzing and accumulating knowledge on how the system is operating under conditions that vary greatly from site to site, such as weather conditions and items produced, we aim to expand the system to even more offices and plants in the future. By making these plants operate on 100% renewable energy in the future, we expand the use of renewable energy for power consumed in the business activities across the Group and contribute to reducing the environmental burden on local communities, thereby helping to create a more sustainable society.



Expanding renewable energy sourcing—Offsite PPA

We are also actively procuring renewable energy from outside our offices and plants. In June 2022, Murata and Mitsubishi Corporation agreed on a cooperative framework for working toward a carbon-neutral society, through which Murata procures 70,000 kW of power derived from renewable energy sources under a virtual PPA by fiscal 2025. We aim of expanding the amount procured to approximately 300 million kWh in the future. In May 2023, Murata entered into a virtual PPA with Renova to purchase power derived from renewable energy source. Under the terms of this agreement, Murata will purchase non-FIT non-fossil fuel energy certificates derived from the electricity generated at new solar power plants

(estimated annual power generation: approx. 100 GWh) Renova will develop exclusively for Murata. This will help Murata to contribute to Japan's carbon neutrality goals through renewable energy procurement with additionality.



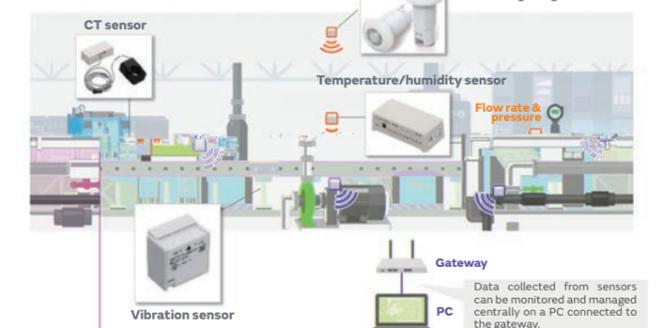
Promoting energy conservation

Continued energy conservation is essential to Murata's efforts to reduce GHG emissions. We installed an energy-saving system combining AI energy-saving controls manufactured by Mutron and Murata's containerized storage batteries at our head office, aiming to achieve an energy-saving rate of 20%. Murata's unique storage battery control technology will enable more flexible energy-saving control, contributing to reducing electricity consumption.

At Minato Mirai Innovation Center (Kanagawa Prefecture), we use IoT for maintenance of our building facility on site using wireless sensors developed by Murata, and manage data, including temperature, humidity, and current values of equipment, on the cloud to visualize the status of the facility. By utilizing IoT tools to analyze data acquired by sensors and for troubleshooting, we achieved a 25% energy saving in air conditioning and a 50% labor saving in patrolling. The project was awarded Excellent FM Award at the 17th Japan Facility Management Association (JFMA) Award. Going forward, we will

expand the introduction of advanced energy-saving measures utilizing IoT at the Group's global operation sites, while also promoting initiatives that we view as business opportunities.

Example of introduction of IoT-based energy-saving measures



Initiatives in the supply chain

Scope 3 accounts for 76% of Murata's total GHG emissions, of which more than half are attributable to Category 1 (purchased goods and services). Believing that the cooperation of suppliers is therefore vital to promoting our efforts to reduce GHG emissions, we communicate Murata's goals and initiatives through interviews to more than ten suppliers of various sizes and business types on the status of their decarbonization efforts and briefing sessions attended by approximately 200 companies. We will not simply demand that suppliers implement decarbonization initiatives, but will provide them with support to assist in reducing GHG emissions. In the future, we are also considering proposing renewable energy and energy-saving systems for which we have a track record of internal use, along with energy management systems, etc., that use Murata sensors.

Topics Challenges for using hydrogen energy

Anticipating the arrival of a hydrogen-based society, we will take on the challenge of creating value only possible with Murata. Preparations are underway to introduce hydrogen-related equipment at Yasu Division (Shiga Prefecture). We are also considering connecting to our inhouse renewable energy systems. We aim for technology development from a needs perspective by using the features of our Yasu Division, where our manufacturing and development departments are located. Aiming to promote innovation through collaboration with outside (third-party) companies and organizations, we made an agreement in June 2022 to collaborate with Mitsubishi Corporation on production and use of hydrogen at our plants.