

# Environment

## Message from Director in Charge of Environment

### Toward achievement of the GY 2050 Carbon Neutrality Target, a top priority of management

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#### Announcement of the GY 2050 Carbon Neutrality Target and aim to reach goal

As moves toward the realization of a sustainable society become increasingly lively on a global scale, we recognize that the achievement of carbon neutrality is one of the top priorities of management for the Company too. As well as setting the target of "Renewable—Making a genuine contribution to carbon neutrality," in Vision 2035, we have announced the GY 2050 Carbon Neutrality Target with the aim of realizing carbon neutrality in Scope 1 and 2 by 2050. As intermediary targets, we are aiming to achieve the Sixth Mid-Term Management Plan and the GY 2030 Long-Term Greenhouse Gas Target.

As well as carbon neutrality, the GS Yuasa Group is endeavoring to conserve the environment in consideration of the impact of our business activities, products, and services on the global environment, and continuous improvements are being made.

#### Promotion of efforts on four priority issues based on our Environmental Mid- to Long-Term Plans

By including environmental targets in the Mid-Term Management Plan since fiscal 2019, the Group is promoting environment-related initiatives as a business strategy responding to an important management issue.

Furthermore, top management is engaging in repeated discussions on sustainable battery development in consideration of resource and environmental problems, and through early application we will contribute to the realization of a circular economy.

The Group recognizes that biodiversity conservation is important to maintain the natural environment in its present state. In the Sixth Mid-Term Management Plan, which started in fiscal 2023, we revised our Fundamental

Environmental Policy and clearly stated that we will strive for biodiversity conservation. Going forward, based on the revised Fundamental Environmental Policy, I hope that we can spread activities contributing to biodiversity conservation throughout the Group.

In addition, we are tackling the following four issues as important environment-related targets:

#### ● Reduction of own CO<sub>2</sub> emissions

As a top priority topic of management, we are discussing and tackling how to reduce the CO<sub>2</sub> emitted in our business activities and how to allocate those resources. As an initiative to reduce CO<sub>2</sub>, in fiscal 2023 we have launched a dedicated organization, the Carbon Neutral Promotion Group, to promote energy-saving measures and further promote the installation of solar power generation equipment and strategic renewable energy procurement at our plants.

#### ● Reduction of water use

We use a lot of water in the manufacturing process for cooling batteries. We recognize that water is an important resource for the continuation of business, and we have set the target of reducing water use by 15% compared with the fiscal 2018 level. We are actively tackling the recycled use of water.

#### ● Expanded sale of environmentally considered products

Positioning products that can contribute to the electrification of automobiles, the expanded introduction of renewable energy, and so on as environmentally considered products, we are endeavoring to promote their sale with the target of boosting their sales ratio to 45% or more.

#### ● Increased usage rate of recycled lead

Since lead, the raw material for lead-acid batteries, which are our mainstay product, is highly recyclable, its recycled use is important. Our aim is to raise the ratio of recycled lead in the lead material of lead-acid batteries to 70% or more by fiscal 2025.

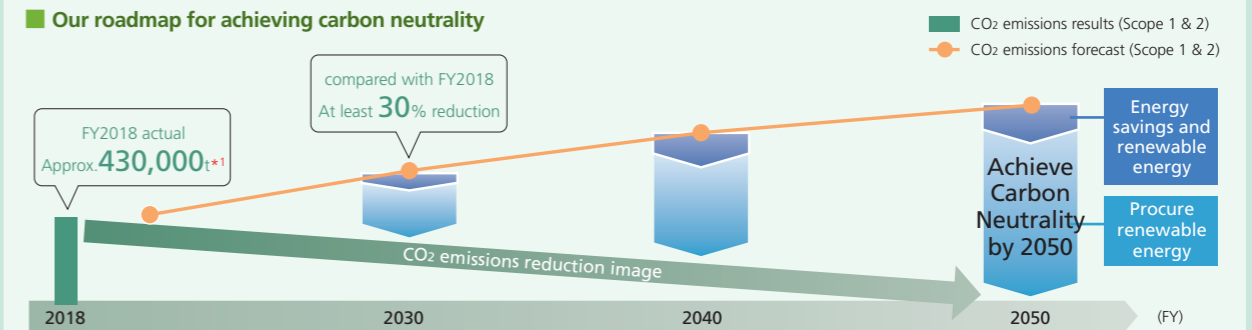
#### Fundamental Environmental Policy

We are committed to people, society, and the global environment through the "Innovation and Growth" of our employees and business entities. We will apply the advanced energy technologies we have built up through battery research and development work to deliver comfort and peace of mind to customers around the world, and aim to realize a sustainable society and increase corporate value.

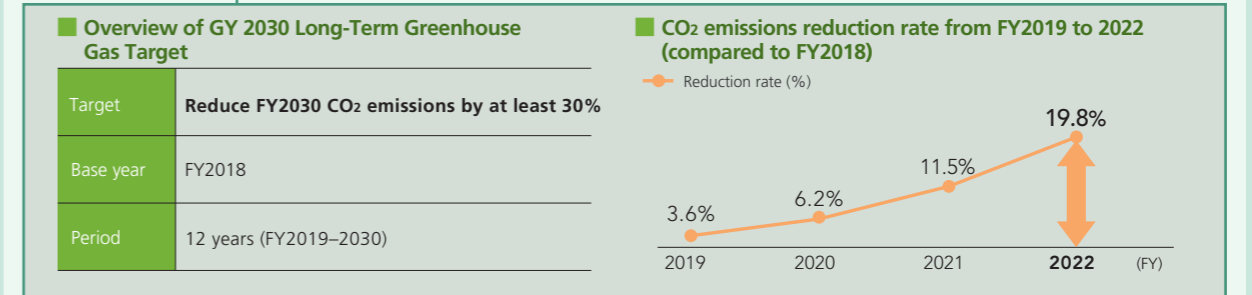
Note: The entire text of our Fundamental Environmental Policy is available on our website: [https://www.gs-yuasa.com/en/csr/env\\_policy.php](https://www.gs-yuasa.com/en/csr/env_policy.php)

## GY 2050 Carbon Neutrality Target

GS Yuasa is pursuing carbon neutrality by FY2050



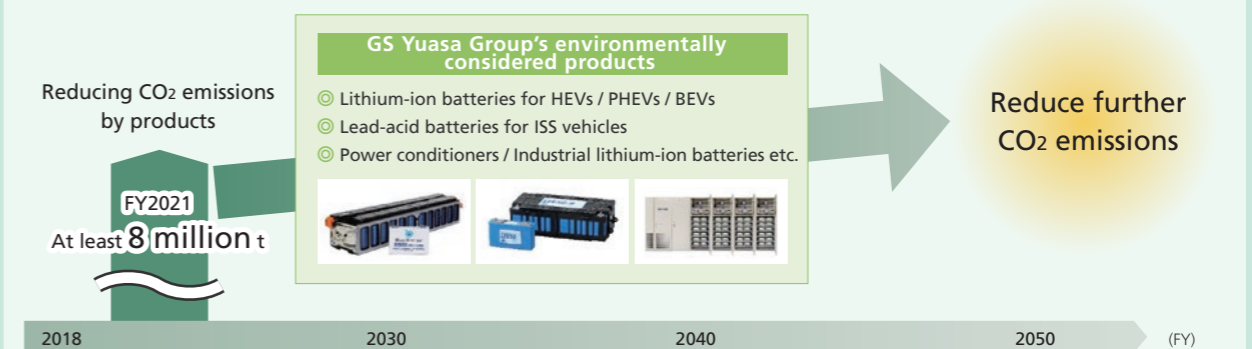
\*1 Since adoption of the Sixth Mid-Term Management Plan, the GS Yuasa Group's CO<sub>2</sub> emissions aggregation standards were changed, and we are undergoing third-party re-verification for FY2018.  
(1) Recalculated using the 2018 emission coefficient obtained from the Ministry of the Environment and IEA  
(2) Adopted the control standard as the calculation standard, and consolidated subsidiaries that can be directly influenced are included in the scope of calculation.



#### Efforts through achieving carbon neutrality → p. 67 Contribution to Realization of Low-carbon Society

<b>Promote energy-saving measures</b> <ol style="list-style-type: none"> <li>1 Install energy-saving equipment</li> <li>2 Develop prescriptions for efficient charging methods and develop new ones</li> </ol>	<b>Promote of generating renewable energy</b> <ol style="list-style-type: none"> <li>1 Maximize introduction in all offices and plants in Japan and overseas</li> <li>2 Introduce our own products including Energy Storage Systems (ESS) and conduct a demonstration experiment</li> </ol>	<b>Procure renewable energy</b> <ol style="list-style-type: none"> <li>1 Purchase electric power that uses renewable energy</li> <li>2 Procure reports of renewable energy</li> </ol>
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#### Contribute to reducing CO<sub>2</sub> emission by expanding sales of environmentally considered products → p. 65 Developing and Popularizing Environmentally Considered Products



# Response to Climate Change (TCFD)

The GS Yuasa Group recognizes that climate-related issues are one of our important management issues. In December 2019 we announced our support for the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), and we are working on climate-related information disclosure based on the TCFD framework.

In fiscal 2021, we launched a project to examine climate-related risks and opportunities in accordance with the TCFD framework. The major scenarios adopted for our analysis of risks and opportunities were the 1.5°C scenario and the stated policies scenario (equivalent to the 3°C scenario). We devised strategies based on the short-term (fiscal 2025), medium-term (fiscal 2030), and long-term (fiscal 2040 and fiscal 2050) time axes.

In fiscal 2023 we disclosed quantitative financial impact assessments for each business for some climate-related risks and opportunities.



## Governance

GS Yuasa International Ltd., our core operating company, plans and implements responses to climate change in the Group. The company's Board of Directors supervises the entire Group, receiving regular progress reports from GS Yuasa International Ltd. and providing guidance as necessary.

Policies, targets, and important topics related to the environment are formulated and deliberated upon by the Sustainability Promotion Committee\* and reported to the Management Meeting and the Executive Conference, which is headed by the president.

### Governance Structures Relating to Climate Issues

<b>Board of Directors</b> <Engages in deliberation and discussion at least once every three months> Approves proposed responses to environmental issues (including climate change), receives status reports, and monitors and oversees progress Directors and auditors	<b>Management Meeting</b> <Engages in deliberation and discussion several times annually> Discusses proposed responses to environmental issues (including climate change) Directors and auditors
<b>Executive Conference</b> <Meets once every six months> Receives reports on proposed responses to environmental issues (including climate change) and manages the progress of responses President, director in charge of the environment, and relevant directors	<b>Sustainability Promotion Committee*<sup>1</sup></b> <Meets once every two months> Formulates and discusses proposed responses to environmental issues (including climate change) and manages the progress of responses Director in charge of sustainability promotion, sustainability promotion managers of each division and each business office

\*1 The CSR Committee was reorganized as the Sustainability Promotion Committee in FY2023.

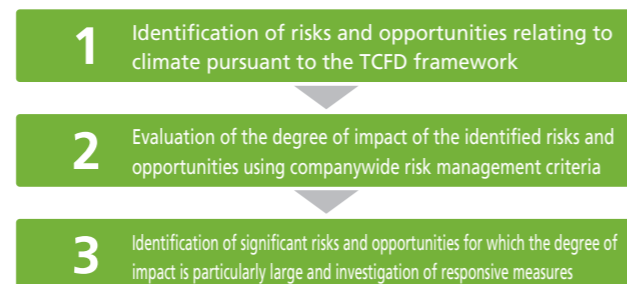
### Examples of past reports and agenda items related to climate change (FY2019–2022)

Meeting entity	Topics reported and discussed
Board of Directors	<ul style="list-style-type: none"> <li>Formulation of the Fundamental Environmental Policy</li> <li>Establishment of the GY 2030 Long-Term Greenhouse Gas Targets</li> <li>Disclosure of business strategies based on the TCFD</li> <li>Renewable energy procurement policy</li> <li>Setting of carbon neutrality targets</li> </ul>
Management Meeting, Executive Conference, Sustainability Promotion Committee* <sup>1</sup>	<ul style="list-style-type: none"> <li>Endorsement of TCFD recommendations and membership of the TCFD Consortium</li> <li>Launch of the Energy Saving and Renewable Energy Project to reduce CO<sub>2</sub> emissions</li> <li>Progress report on the Energy Saving and Renewable Energy Project</li> <li>Introduction of internal carbon pricing (ICP)</li> <li>Introduction of in-house solar power generation</li> <li>Formulation of environmental targets in the Sixth Mid-Term Management Plan</li> </ul>

## Risk Management

Risks and opportunities are identified and evaluated through the process described below. Identified risks and opportunities, and the responses to them, are managed under our governance structures including the Sustainability Promotion Committee.

In fiscal 2021, each business division and management division established a project team to conduct companywide analysis of scenarios and examine countermeasures.



## Strategy

### Assumed Conditions / Main Scenarios

#### Main Scenarios Used in Scenario Analysis\*<sup>2</sup>

Temperature increase	Main scenarios used	Overview
1.5°C	IEA* <sup>3</sup> Net Zero Emissions by 2050 Scenario (NZE)	A scenario indicating what the world (policies, technologies, markets, etc.) needs to look like in order to achieve net zero global greenhouse gas (GHG) emissions by 2050 (assumed through a backcasting method)
	IPCC* <sup>4</sup> RCP* <sup>5</sup> 2.6 Scenario and SSP* <sup>6</sup> 1-2.6 Scenario	RCP2.6: A scenario that assumes future temperature rise to be limited to less than 2°C used in the IPCC Fifth Assessment Report SSP1-2.6: A scenario for the introduction of climate policies to limit future temperature increases to less than 2°C under sustainable development used in the IPCC Sixth Assessment Report
3°C	IEA Stated Policies Scenario (STEPS)	A scenario based on energy and climate policies previously implemented and individual policies that are currently being implemented by individual governments
	IPCC RCP 8.5 Scenario and SSP 5-8.5 Scenario	RCP8.5: A scenario with maximum GHG emissions used in the IPCC Fifth Assessment Report SSP5-8.5: A scenario with no climate policies used in the IPCC Sixth Assessment Report

\*<sup>2</sup> Scenario analysis uses the scenarios of public agencies and may differ from actual future social conditions. \*<sup>3</sup> International Energy Agency  
\*<sup>4</sup> Intergovernmental Panel on Climate Change \*<sup>5</sup> Representative Concentration Pathways  
\*<sup>6</sup> Shared Socioeconomic Pathways

#### Time Axis

	Short term	Medium term	Long term
End year	2025	2030	2050
Reason for adoption	Periods of the Fifth (FY2019–FY2022) and the Sixth (FY2023–FY2025) Mid-Term Management Plans	Achievement period of the GY 2030 Long-Term Greenhouse Gas Targets and SDGs	Achievement period of the GY 2050 Carbon Neutrality Target

### Assumed social conditions based on scenario analysis

Social conditions under scenario		Through 2025 (short term)	Through 2030 (medium term)	Through 2050 (long term)	
1.5°C scenario	Operations	Social demand for emissions reduction	-20%	-40%	-100%
	Automotive related business	Carbon price	\$75 / t-CO <sub>2</sub>	\$130 / t-CO <sub>2</sub>	\$250 / t-CO <sub>2</sub>
		Changes in the automobile market	Expansion of automobile electrification Structural changes in the automobile industry in conjunction with electrification	Passenger cars (Global)	
				Number of vehicles (compared to present) Sales: 1.3 times Ownership: 1.6 times Percentage of EVs, PHEVs, and FCVs* <sup>7</sup> Sales: 64% Ownership: 20%	Number of vehicles (compared to present) Ownership: 2.1 times Sales: 100% Ownership: 86%
	Development of alternative technologies to replace lead-acid batteries	In conjunction with increasing demand for batteries for applications relating to transportation and electric power, prices will decline for alternative technologies, such as lithium-ion batteries, to take the place of lead-acid batteries	Motorcycles and three-wheel vehicles (global)		
	Industrial battery and power supply related business	Changes in energy-related markets	Percentage of EVs Sales: 85% Ownership: 54%		Percentage of EVs Sales: 100% Ownership: 100%
Supply chains R&D	Development of alternative technologies to replace lead-acid batteries	In conjunction with the rapid expansion of solar and wind power generation, demand for batteries used for electric power will expand Batteries for storing excess power from renewable energy sources will increasingly be converted to use for backup applications			
	Raw materials	Demand for lithium, nickel, and other resources will increase rapidly as demand for lithium batteries increases for use with energy storage technologies and renewable energy Competition to sustainably secure raw materials will intensify			
	Acceleration of the circular economy* <sup>8</sup>	Needs for products adapted to a recycling-oriented society will increase year-by-year			
3°C scenario	Operations	Storm and flood damage, storm surges	As battery demand for transportation and electric power related applications expands, the development and spread of battery technologies with higher added value in terms of safety, energy density, cost, charging speed, and life span will progress		
			The frequency of flooding will more than double compared to now in Japan and other regions Sea levels will rise about approximately 0.3 m The frequency of intense storms in the vicinity of Japan will increase		
	Industrial battery and power supply related business	Storm and flood damage, storm surges	Expansion of business relating to disaster countermeasures		

\*<sup>7</sup> EV: Electric Vehicle; PHEV: Plug-in Hybrid Electric Vehicle; FCV: Fuel Cell Vehicle

\*<sup>8</sup> An economic mechanism for the circulation of resources without waste. Positioned as a medium- to long-term economic growth policy, particularly in European countries.



### Risks and Opportunities

1.5°C scenario	Operations	<p><b>Introduction of carbon tax and renewable energy</b></p> <p><b>Risk</b> Increased costs for energy saving and renewable energy to reduce CO<sub>2</sub> emissions</p> <p><b>Risk</b> Increased carbon costs for the company's emissions in conjunction with the introduction of a carbon tax</p> <p><b>Risk</b> Increased carbon costs for emissions in upstream segments of supply chains</p> <p>In the case of the 1.5°C scenario, targets for a major reduction of CO<sub>2</sub> will be required and carbon taxes will be introduced to achieve carbon neutrality. On the other hand, by implementing CO<sub>2</sub> reduction measures through the introduction of energy-saving equipment and renewable energy, it will be possible to reduce the carbon tax burden to a certain extent. Results of a scenario-based estimate of the financial impact indicated a risk that the introduction of a carbon tax will increase costs by about 3-4 billion yen over the medium to long term. By thorough energy saving and the planned introduction of renewables, however, the cost increase could be reduced to about 2 billion yen.</p>
	Automotive related business	<p><b>Opportunity</b> Higher demand for batteries in conjunction with increased sales and ownership of passenger vehicles</p> <p><b>Starting batteries and batteries for auxiliary equipment</b></p> <p><b>Opportunity</b> Higher demand for batteries for auxiliary equipment used in EVs and PHEVs</p> <p><b>Opportunity</b> <b>Risk</b> Replacement of lead-acid batteries with lithium-ion batteries</p> <p><b>Risk</b> Declining demand for starting batteries used in internal combustion engine vehicles</p> <p>In conjunction with expansion of the market for EVs, PHEVs, and other such vehicles, demand for starting batteries used in internal combustion engine vehicles is expected to decline, but demand for batteries for auxiliary equipment is expected to increase. Also, the shift from a certain number of lead-acid batteries to lithium-ion batteries is expected to advance. As a result of our estimate of the financial impact, based on the establishment of certain conditions with reference to a scenario-based market, we concluded that while sales of starting batteries will decline sharply, overall sales could increase by 35-55 billion yen over the medium to long term due to a substantial increase in the demand for batteries for auxiliary machinery.</p>
	Industrial battery and power supply related business	<p><b>Batteries for HEVs*9, PHEVs, and EVs</b></p> <p><b>Opportunity</b> Higher demand for batteries used in EVs and PHEVs</p> <p><b>Opportunity</b> <b>Risk</b> Changes in demand for batteries used in HEVs and PHEVs (higher demand over the short to medium term and declining demand over the long term)</p> <p>It is expected that over the short to medium term, sales of HEVs and PHEVs will increase, but in the long term, as sales of EVs increase substantially and account for approximately 100% of sales in 2050, the battery market will change.</p>
	Supply chains R&D	<p><b>Lead-acid batteries for backup applications and forklifts</b></p> <p><b>Opportunity</b> Higher demand for batteries</p> <p><b>Risk</b> Replacement of lead-acid batteries with lithium-ion batteries</p> <p>Demand for batteries used in transportation and electric power related applications is expected to increase, but as technological innovation progresses, it is expected that prices for lithium-ion batteries and other such products will fall and that a certain number of lead-acid batteries will be replaced by lithium-ion batteries.</p>
3°C scenario	Operations	<p><b>Raw materials procurement and circular economy</b></p> <p><b>Opportunity</b> Improvement in the superiority of recyclable lead in a recycling-oriented society</p> <p><b>Risk</b> Difficulty procuring and rising price for metal resources</p> <p><b>Risk</b> Difficulty sustainably procuring and rising price for sustainable raw materials</p> <p>Risks such as rising resource prices and difficult securing resources are expected over the short to medium term. On the other hand, with the development of alternative technologies, it is expected that tight supply and demand situations will be alleviated over the long term. It is also expected that competition relating to sustainable procurement of raw materials will intensify in terms of the environment and society.</p>
	Industrial battery and power supply related business	<p><b>Energy storage systems (ESS) for renewable energy</b></p> <p><b>Opportunity</b> Higher demand for batteries and peripheral systems and devices</p> <p>It is expected that in conjunction with the increased introduction of solar, wind, and other renewable energy generation, demand for batteries and peripheral systems and devices for electricity load leveling and the like will increase. As a result of our estimate of the financial impact, setting certain conditions with reference to a scenario-based market, we concluded that sales could increase by 7-22 billion yen over the medium to long term due to an expansion of the market for energy storage systems for renewable energy in Japan.</p>
	Supply chains R&D	<p><b>Technological innovation</b></p> <p><b>Opportunity</b> <b>Risk</b> Increased business opportunities as a result of leading development of next-generation batteries technologies (all-solid-state batteries, etc.)</p> <p>It is expected that the development and spread of higher added value battery technologies (all-solid-state batteries, metal-air batteries, sulfur batteries, etc.) for transportation and electric power related applications will advance. In cases where the company can lead the development of new technologies, business opportunities will arise.</p>
3°C scenario	Operations	<p><b>Natural disasters and temperature rise</b></p> <p><b>Risk</b> Increased damage to facilities due to storm and flooding disasters and increased loss of profit due to business suspension</p> <p><b>Risk</b> Business suspension due to damage to supply chains</p> <p><b>Risk</b> Increased costs for air conditioning and cooling processes</p> <p>There is a risk of greater impact due to increased storm and flooding damage, including property damage to facilities and machinery at the company's plants, loss of profits from business suspension, and the inability of workers to report to work. The interruption of supply chains is also anticipated. As a result of an examination of flood and storm surge risks based on future climate change impacts using natural disaster simulations, five sites and subsidiaries (two in Japan and three overseas) were evaluated as high-risk. In the event of a 100-year disaster at the Kyoto Plant, where the estimated scale of damage would be large, there could be a potential loss in sales of 9-13 billion yen over the medium to long term.</p>
	Industrial battery and power supply related business	<p><b>Emergency power supplies</b></p> <p><b>Opportunity</b> Increased demand for emergency power supplies as countermeasures against severe disaster</p> <p>It is expected that demand for emergency power supplies will increase out of concern regarding intensification of natural disasters due to climate change.</p>

Note: Those items that were determined in the risk assessment to be of particular importance in the short to long term are listed.  
 \*9 HEV: Hybrid Electric Vehicle

### Direction of Business Strategies

		Now	2050
1.5°C scenario	Operations	<p><b>Reduce CO<sub>2</sub> emissions by at least 30% by 2030</b></p> <p>Implement measures for energy conservation and use of renewable energy</p>	<p><b>Further accelerate measures for achieving carbon neutrality</b></p> <p>Further implement measures for energy conservation and procurement of renewable energy</p>
	Automotive related business	<p><b>Securing profits from lead-acid batteries for internal combustion engine vehicles</b></p> <p>Introduce differentiated products, strengthen our sales capabilities, and increase sales of high-value-added products with a focus on regions where internal combustion engine business remains such as ASEAN</p>	<p><b>Capture demand for batteries for auxiliary equipment used in electric vehicles</b></p> <p>Capture demand for 12V lead-acid or lithium-ion batteries for auxiliary equipment used in electric vehicles as well (for new automobiles and for replacement)</p>
	Industrial battery and power supply related business	<p><b>Expand production of lithium-ion batteries for HEVs and PHEVs</b></p> <p>Production will increase, particularly for Japanese automakers, but will decline in the future</p>	<p><b>Capture demand for redundant batteries used in electric vehicles</b></p> <p>Capture demand for lithium-ion batteries used for backup of self-driving vehicles</p>
	Supply chains R&D	<p><b>Develop the market for lead-acid batteries with high recycling rates</b></p> <p>Commercialize lead-acid batteries compatible with the needs of a recycling-oriented society</p>	<p><b>Full-scale entry into EV lithium-ion battery market</b></p> <p>Invest development resources to enter the market for lithium-ion batteries used in EVs, which are used under demanding environments and must be highly reliably</p>
3°C scenario	Operations	<p><b>Countermeasures against intensifying disasters</b></p> <ul style="list-style-type: none"> <li>Evaluate future risks including climate risks and implement countermeasures as necessary</li> <li>Undertake BCP including supply chains</li> </ul>	
	Industrial battery and power supply related business	<p><b>Contribute to countermeasures against intensifying disasters using backup power supplies</b></p> <p>Focus on market expansion conditions and respond to needs</p>	

### Metrics and Targets

● Sixth Mid-Term Management Plan (FY2023-2025)

<p><b>CO<sub>2</sub> emissions</b></p> <p>Reduce by at least <b>15%</b> (compared to FY2018)</p>	<p><b>Water consumption</b></p> <p>Reduce by at least <b>15%</b> (compared to FY2018)</p>
<p><b>Percentage of environmentally considered products in total sales of all products</b></p> <p><b>45%</b> or more</p>	<p><b>Ratio of recycled lead used as lead raw materials in lead-acid batteries</b></p> <p><b>70%</b> or more</p>

● Target for reduction of CO<sub>2</sub> emissions (Scope 1 and 2)

<p><b>2030</b></p> <p>Reduce by at least <b>30%</b> (compared to FY2018)</p>	<p><b>2050</b></p> <p><b>Carbon neutrality</b></p>
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● Internal Carbon Pricing (ICP)

<p>The price will be set at <b>¥8,600</b> / t-CO<sub>2</sub></p> <p>Use as reference information when making investment decisions regarding energy-saving and renewable energy measures</p>
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# Environmental Initiatives

## Developing and Popularizing Environmentally Considered Products

The GS Yuasa Group announced GY 2050 Carbon Neutrality Target, which seeks to eliminate CO<sub>2</sub> emissions from the Group's business activities by 2050. We believe that the Group's products should play a major role in achieving carbon neutrality. By increasing sales of environmentally considered products, we will reduce CO<sub>2</sub> emissions and contribute to the global environment and society.

### Environmental assessment items

- 1 Energy conservation
- 2 Volume reduction
- 3 Recyclability
- 4 Ease of disassembly
- 5 Ease of separation processing
- 6 Safety and environmental conservation
- 7 Material selection
- 8 Ease of maintenance
- 9 Energy efficiency
- 10 Reusability (life extension)

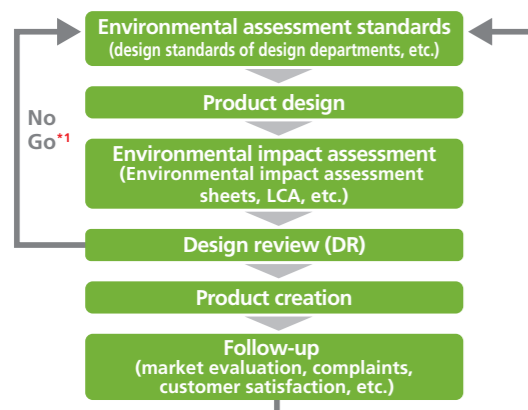
### Designing environmentally considered products

The Group's products have some impact on the environment during every stage of the product life cycle, from procurement and manufacturing to transportation, use and disposal. In order to reduce the environmental burden throughout the product life-cycle caused by the consumption of resources and the generation of greenhouse gases and waste, the Group is committed to improving the product performance through designing that considers selection of raw materials, ease of disassembly and segregation, energy conservation, and appropriate labelling.

### Environmental assessment

For an environmental assessment of product design, design departments employ design standards and then evaluate the suitability of products in design review (DR) meetings based on environmental impact assessments of every stage of the product life cycle. When environmental impact standards are not met, we review the design standards and redesign the product. We use the expertise of several departments in addition to design departments, including engineering, marketing, procurement, quality and the environment, to make sure that the results of Design for the Environment (DfE) are communicated widely, which also maximizes their effectiveness.

### Flow of environmental assessment

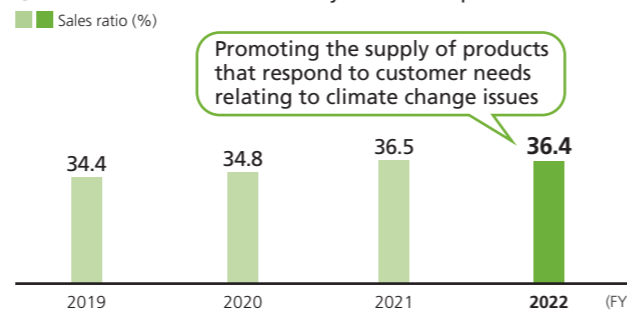


\*\*1 If the environmental assessment standards are not met, assessment will be conducted again from the beginning.

### Popularizing environmentally considered products

The Group defines environmentally considered products as those products that help mitigate global warming, and we are actively working to develop and popularize such products. We incorporate into the Mid-Term Management Plan sales targets for environmentally considered products, making it part of our business strategy to work on climate change through the products we provide to customers.

### Sales ratio of environmentally considered products



### Examples of environmentally considered products

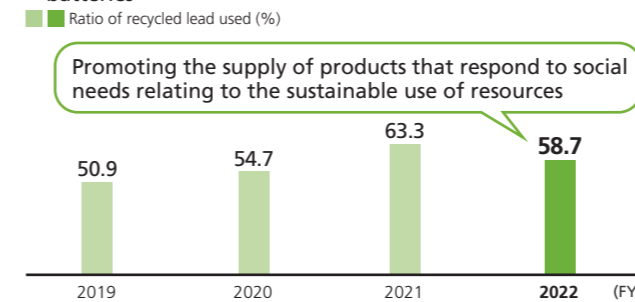
Business sector	Examples of Product
Automotive batteries	<ul style="list-style-type: none"> <li>● Lead-acid batteries for vehicles with start-stop systems (ISS: idling stop systems)</li> </ul> <p>Batteries for ISS vehicles for improving gas mileage by allowing the engine to stop instead of idling to reduce fuel consumption</p>
Industrial batteries and power supplies	<ul style="list-style-type: none"> <li>● Power conditioners</li> <li>● Lithium-ion batteries</li> </ul> <p>Effectively utilizing renewable energy</p>
Automotive lithium-ion batteries	<ul style="list-style-type: none"> <li>● Lithium-ion batteries for HEVs</li> <li>● Lithium-ion batteries for BEVs and PHEVs</li> </ul> <p>Batteries for HEVs, BEVs and PHEVs installed in electric vehicles and that contribute significantly to reducing greenhouse gases</p>

### Increasing usage rate of recycled lead in products

The Group is working to increase the usage rate of recycled lead—the primary material used in lead-acid batteries, one of our core products. We take action to work toward a recycling-oriented society as part of our business strategy by incorporating into the Group's Mid-Term Management Plan targets for the usage rate of recycled lead contained in our lead-acid batteries.

We have been taking action to recycle our post-use products by building and operating a recycling system based on extended producer responsibility (EPR). Going forward, we also plan to strengthen our efforts to promote the use of recycled materials in our products.

### Ratio of recycled lead used as lead raw material in lead-acid batteries



### Management of chemical substances contained in products

The Group takes steps to provide products with minimal environmental burden based on the Chemical Substance Management Guidelines, which clarify the standards for chemical substances in products.

These guidelines are part of initiatives to examine chemical substances contained in materials delivered as stipulated in the GS Yuasa Group green procurement criteria. With these guidelines, we classify chemicals contained in our main materials, as well as the secondary

materials and the parts used in the products that the Group makes and sells as either prohibited substances or managed substances.

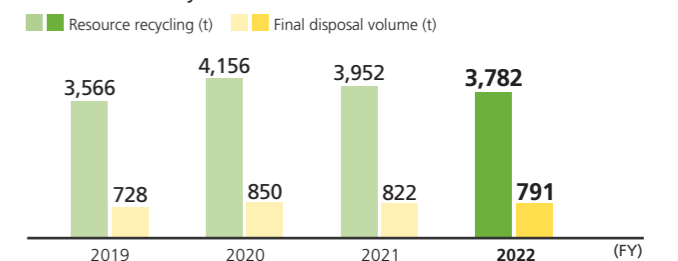
We work with our suppliers who supply main materials, auxiliary materials, and components to identify and definitively manage the substances covered by the guidelines.

### Resource recycling pursuant to wide-area certification system

The Group believes in the importance of creating and operating a system for recycling resources from used products to help create a recycling-oriented society. To achieve this goal, we are promoting initiatives for processing used products and resource recycling by using the wide-area certification system<sup>\*2</sup>. In January 2008, we acquired wide-area certification from the Ministry of the Environment for industrial batteries and power supplies, and we commenced operation of a recycling system based on this certification starting with orders received in January 2009. Even following the start of operations, we continue to make improvements such as expanding the scope of covered products and reviewing operational rules to create mechanisms for the reliable and proper disposal of used industrial batteries.

<sup>\*2</sup> A wide-area certification system aims to involve the manufacturers of a product in the product's recycling and disposal once it reaches the end of its useful life. These systems make possible more efficient recycling and provide feedback on product design leading to easier disposal and reuse, while ensuring that discarded goods are disposed of properly.

### Status of resource recycling pursuant to wide-area certification system



## Contribution to Realization of Low-carbon Society (Promoting Environmental Protection)

In order to reliably promote our initiatives for achieving carbon neutrality, we have reviewed the companies subject to our Environmental Mid- to Long-Term Plans so that we can exert appropriate control and concentrate our management resources within the Group. In addition, CO<sub>2</sub> emission conversion factors for Scope 2 have also been changed to improve the suitability of greenhouse gas emission calculation results.

The reviewed scope of application (new standards) has been enforced since fiscal 2022; however, since the

medium-term environmental goals within our Fifth Mid-Term Management Plan which ended in fiscal 2022 had been set under the scope of application before this review (old standards), the calculation results found through the old standards were used to evaluate the goal achievement status. Regarding the medium- to long-term environmental goals in our Sixth Mid-Term Management Plan, starting from fiscal 2023, we will continue to contribute to the realization of a sustainable society by promoting effective action plans for Group companies under the new standards.

### Review of scope of application in our Environmental Mid- to Long-Term Plans

Scope of application	Old standards (prior to review)	New standards (after review)	Remarks
Scope	Group companies with key production sites (7 domestic plants, 20 overseas companies)	Consolidated target companies with production sites for which annual CO <sub>2</sub> emissions of 1,000 tons or more (8 domestic plants, 16 overseas companies)	New standards include production sites with CO <sub>2</sub> emissions under 1,000 tons that are expecting increased emissions in the future
CO <sub>2</sub> emission conversion factors for Scope 2	<span style="color: red;">D</span> Factors for fiscal 2016 released by the Electric Power Council for a Low Carbon Society	Factors for each fiscal year released by each electric power company in accordance with the Act on Promotion of Global Warming Countermeasures	CO <sub>2</sub> emission conversion factors related to the usage of renewable energy derived electric power is set at zero
	<span style="color: blue;">O</span> Factors of each country released by GHG Protocol	Factors of each fiscal year issued in "Emissions Factors" by the IEA (International Energy Agency)	

D Domestic O Overseas




Reduction of CO<sub>2</sub> emissions

The Group believes that it is important to continuously improve the energy management system associated with its business activities and promotes the reduction of greenhouse gas emissions in order to respond to the social changes accompanying the transition to a decarbonized society (such as requests from stakeholders to reduce greenhouse gas emissions, addition of carbon prices to the use of fossil fuels, and shift from fossil fuels to renewable energy).

In fiscal 2023, the Group established an organization dedicated to promoting group-wide energy saving and renewable energy use in order to achieve our Carbon Neutrality Declaration targeted at fiscal 2050 and our long-term environmental goals (30% or higher reductions by fiscal 2030 compared to fiscal 2018). This organization promotes activities to formulate specific action plans for business divisions in order to continuously engage in company-wide project activities carried out in fiscal 2021 and fiscal 2022.

Note: The Group manages CO<sub>2</sub> emissions in totality and not on a basis of intensity, with the aim of reducing greenhouse gas emissions consistent with the Paris Agreement.

Measures to achieve our CO<sub>2</sub> emissions reduction targets

Classification	Items	Main initiatives
Promoting measures to save energy	Review of facility renewal standards	● Formulate an effective facility renewal plan (utilization of facility management ledger)
	Improvement of production processes	● Improvement of storage battery charging process ● Examining for improvement of charging facilities
	Efficient use of production facilities	● Thorough periodic inspections of capacity utilization status
Introduction of solar power generation facility in our own factories	Implementation of and examining for the plan to introduce solar power generation facility	● Installation of a solar power generation system at the Ritto Plant (rating capacity: 2.2MW; estimated reduction: 700t-CO <sub>2</sub> /year) ● Examining for the introduction of mega solar power generation facility at business sites and Group companies in Japan 
	Survey on the introduction of solar power generation facility	● Survey the feasibility of introducing equipment at all 11 business sites and Group companies in Japan
Procuring renewable energy from the market	Procuring electricity derived from renewable energy	● Switching to 100% renewable energy for electricity used at the Kyoto Plant (Procured 100 GWh equivalent per year from November 2021; fiscal 2022 reduction volume: 28,612t-CO <sub>2</sub> )
	Procurement of electricity through renewable energy certificates	● Acquisition of domestic and overseas renewable energy certificates (20 GWh equivalent; fiscal 2022 reduction volume: 9,250t-CO <sub>2</sub> )

TOPIC

Energy conservation activities at our Gunma Plant

The Group has continued to promote initiatives for the rational utilization of energy in order to reduce greenhouse gas emissions. The Gunma Plant has engaged in the cyclic utilization of hot air emitted from electric hot-air generators used in the battery manufacturing process. These activities are expected to reduce electric power consumption by 28.2% (15 tons of CO<sub>2</sub> emission reductions per year) compared to previous levels.

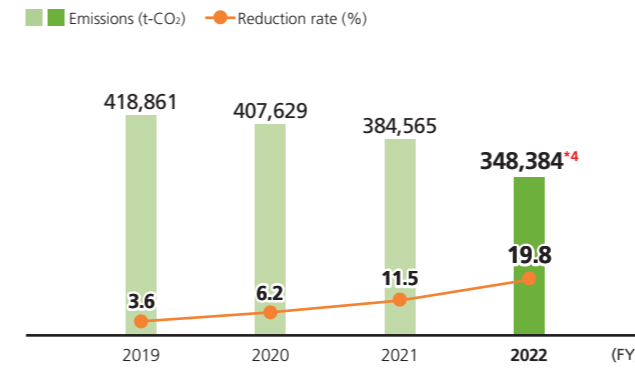


Electric hot-air generator

Usage status of renewable energy at our factories by region (FY2022)

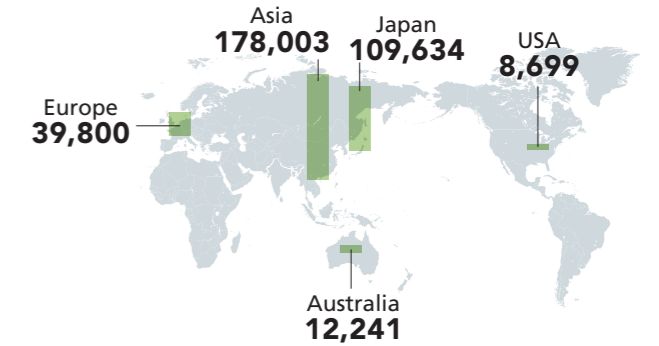
Country	Production sites	Classification		Electric power (MWh)
		In-house	External	
Japan	GS Yuasa International Ltd. Kyoto Office	In-house		110
		External		92,001
	GS Yuasa International Ltd. Osadano Office	External		304
	GS Yuasa International Ltd. Ritto Office	In-house		377
UK	GS Yuasa Battery Manufacturing UK Limited	External		856
		External		2,555
Thailand	Siam GS Battery Co., Ltd.	In-house		1,569
	Yuasa Battery (Thailand) Pub. Co., Ltd	In-house		2
	GS Yuasa Siam Industry Ltd.	In-house		1,231
Vietnam	GS Battery Vietnam Co., Ltd.	In-house		156
Total				99,161

Changes in the Group's CO<sub>2</sub> emissions and the reduction rate\*



\*3 Compared to fiscal 2018.  
\*4 The amount of CO<sub>2</sub> emissions in fiscal 2022 is provisional.  
Note: The scope of application was changed in fiscal 2018.

Group's CO<sub>2</sub> emissions by region (FY2022) (t-CO<sub>2</sub>)



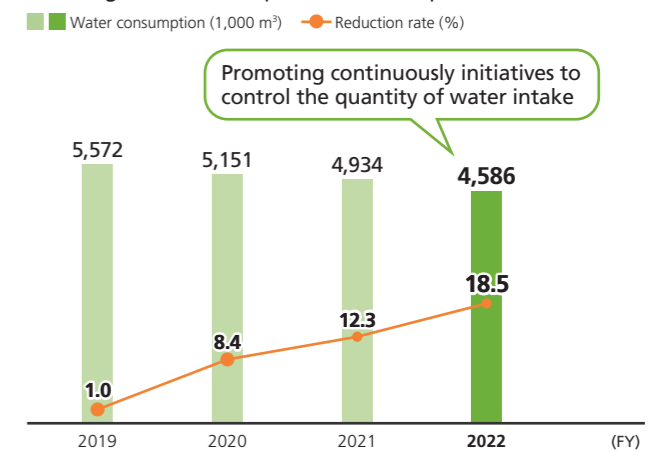
Promotion of Effective Use of Water Resources (Promoting Environmental Protection)

The Group uses a large amount of quality fresh water for applications such as dilution of electrolytes, which are storage battery materials, and cooling of storage batteries in the charging process. Since water resources are important natural resources for the continuation of business activities, we believe it is important to work on ensuring quality freshwater and reducing water consumption. In addition, in the production process of lead-acid batteries, water containing harmful substances (such as lead) is discharged. We recognize the importance of properly treating wastewater so that such wastewater does not adversely affect the surroundings of our business sites.

Reducing water use

The Group is working to improve the efficiency of water use in conjunction with our business strategy by incorporating the target for reducing water consumption in production activities worldwide (reduction of water consumption by 15% or more by fiscal 2025 compared with the fiscal 2018) in its Mid-Term Management Plan.

Changes in the Group water consumption and the reduction rate\*



\*5 Compared to fiscal 2018.  
Note: The scope of application was changed in fiscal 2018.

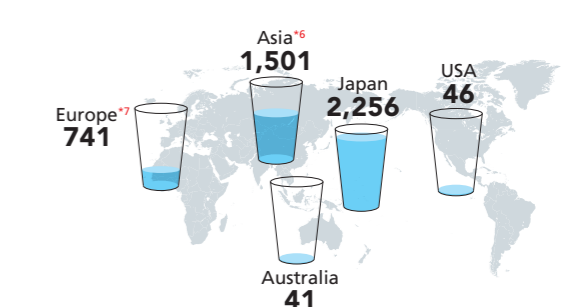
Responding to water risks

By securing water necessary for business activities and through an appropriate response to water risks such as environmental pollution around business sites due to wastewater, the Group aims to promote water security initiatives as well as realize the sustainable use of water resources. To that end, we are working to prevent water risks from surfacing by taking measures such as efficient use of water and appropriate wastewater treatment. Further, we are responding to climate change-related risks based on the TCFD recommendations with respect to risks of damage due to floods (such as the shutdown of our factories due to flooding and disruptions in the supply chain).

Examples of a water risk initiative

Category	Item	Example of Initiative
Water consumption	Reusing water	Recycling water used in the production process
	Wastewater management	Thorough implementation and management based on voluntary management standards that are stricter than regulatory standards; regular maintenance and management of wastewater treatment facilities
Treatment of wastewater	Preventing under seepage	Installation of dikes at wastewater treatment facilities and impermeability of floor surfaces
	Responding to emergency situations	Establishing response procedures and training for emergency situations in case of water leakage

Group's water consumption by region (FY2022) (1,000m<sup>3</sup>)



\*6 Total of China, Taiwan, Vietnam, Malaysia, Indonesia, and Thailand  
\*7 Total of UK, Hungary, and Turkey