

# Response to Climate Change (TCFD)

The Group recognizes that climate-related issues are one of the important management issues and, in December 2019, we announced its support for the Task Force on Climate-related Financial Disclosures (TCFD) recommendations and are working on climate-related information disclosure based on the TCFD framework. In fiscal 2021, we launched a project to integrate climate-related risks and opportunities into our future business plans. The climate change scenarios used in the analysis are 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 2050) time axes.



## Governance

Environmental issues (including climate change) are positioned as important management issues for the Group, and the CSR Committee, which is chaired by the director in charge of CSR, formulates and deliberates on environment-related policies, targets, and important topics. The details of deliberations are reported to the Executive Conference, which is headed by the president and has the relevant officers as members.

Topics determined in the Executive Conference to be of material significance are discussed by the Management Meeting and then approved by the Board of Directors. In addition, the status of responses to formulated environmental policies and objectives is reported to individual bodies, which monitor and manage progress.

### [Governance structures relating to climate-related issues]



### [Examples of Matters Discussed by or Reported to the Board of Directors and Management Meeting]

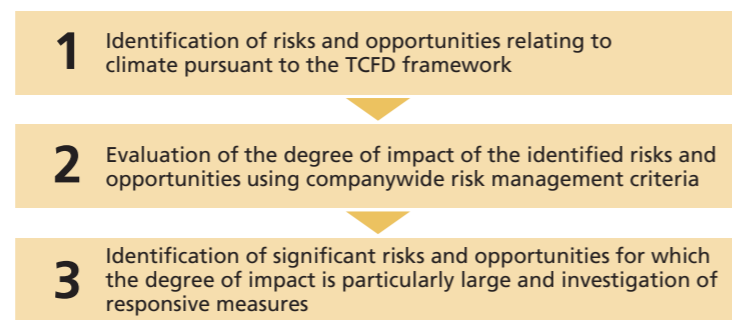
- Formulation of environmental targets on the Fifth Mid-Term Management Plan
- Endorsement of the recommendations of the TCFD
- Formulation of the Fundamental Environmental Policy
- Formulation of long-term environmental target (GY 2030 Long-Term Greenhouse Gas Target) and others

## Risk management

Risks and opportunities are identified and evaluated through the process described on the right.

Identified risks and opportunities and the responses to them are managed under the governance structures including the CSR Committee.

In fiscal 2021, each business division and the Head Office Corporate Management Division established a project team to conduct companywide analysis of scenarios and formulation of strategies.



## Strategy

### <Assumed conditions>

[Time Axis]

	Short term	Medium term	Long term
End year	2025	2030	2050
Reason for adoption	Periods of the Fifth (FY2019–2022) and the Sixth (FY2023–2025) Mid-Term Management Plans	Period of the GY 2030 Long-Term Greenhouse Gas Target and achievement of SDGs	1.5°C target achievement period

### [Main Scenarios Used in Scenario Analysis\*1]

Temperature increase	Main scenarios used	Overview
1.5°C	IEA*2 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*3 RCP*4 2.6 Scenario and SSP*5 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

\*1 Scenario analysis uses the scenarios of public agencies and may differ from actual future social conditions.  
\*2 International Energy Agency  
\*3 Intergovernmental Panel on Climate Change  
\*4 Representative Concentration Pathways  
\*5 Shared Socioeconomic Pathways

### [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%	
		Carbon price	\$75 / t-CO <sub>2</sub>	\$130 / t-CO <sub>2</sub>	\$250 / t-CO <sub>2</sub>	
	Automotive related business	Changes in the automobile market	<ul style="list-style-type: none"> <li>Expansion of automobile electrification</li> <li>Structural changes in the automobile industry in conjunction with electrification</li> </ul>	Ratio of EVs, PHEVs, and FCVs*6 in passenger vehicles (global) <ul style="list-style-type: none"> <li>Sales volume: 64% (1.3 times)</li> <li>Ownership: 20% (1.6 times)</li> </ul>	Ratio of EV two-wheeled and three-wheeled vehicles (global) <ul style="list-style-type: none"> <li>Sales volume: 85%</li> <li>Ownership: 54%</li> </ul>	<ul style="list-style-type: none"> <li>Sales volume: 100%</li> <li>Ownership: 86% (2.1 times)</li> </ul>
		Development of alternative technologies to replace lead-acid batteries	<ul style="list-style-type: none"> <li>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</li> </ul>			
	Industrial battery and power supply related business	Changes in energy-related markets	<ul style="list-style-type: none"> <li>In conjunction with the rapid expansion of solar and wind power generation, demand for batteries used for electric power will expand</li> <li>Batteries for storing excess power from renewable energy sources will increasingly be converted to use for backup applications</li> </ul>			
		Development of alternative technologies to replace lead-acid batteries	<ul style="list-style-type: none"> <li>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</li> </ul>			
	Supply chains R&D	Raw materials	<ul style="list-style-type: none"> <li>Demand for lithium, nickel, and other resources will increase rapidly as demand for lithium-ion batteries increases for use with energy storage technologies and renewable energy</li> <li>Competition to sustainably secure raw materials will intensify</li> </ul>			
		Acceleration of the circular economy*7	<ul style="list-style-type: none"> <li>Needs for products adapted to a recycling-oriented society will increase year-by-year</li> </ul>			
		Emergence and spread of alternative technologies to replace lithium-ion batteries	<ul style="list-style-type: none"> <li>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</li> </ul>			
	3°C scenario	Operations	Storm and flood damage, storm surges			<ul style="list-style-type: none"> <li>The frequency of flooding will more than double compared to now in Japan and other regions</li> <li>Sea levels will rise about approximately 0.3 m</li> <li>The frequency of intense storms in the vicinity of Japan will increase</li> </ul>
Industrial battery and power supply related business		Storm and flood damage, storm surges			<ul style="list-style-type: none"> <li>Expansion of business relating to disaster countermeasures</li> </ul>	

\*6 EV: Electric Vehicle; PHEV: Plug-in Hybrid Electric Vehicle; FCV: Fuel Cell Vehicle  
\*7 An economic mechanism for the circulation of resources without waste. Positioned as a medium- to long-term economic growth policy, particularly in European countries.

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## <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>Under 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. Cost increases are expected due to the introduction of energy-saving equipment and renewable energy to reduce CO<sub>2</sub> emissions in order to achieve carbon neutrality.</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 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 the 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 while demand for batteries for auxiliary equipment is expected to increase. Also, a shift of a certain number of lead-acid batteries to lithium-ion batteries is expected.</p>
	Industrial battery and power supply related business	<p><b>Batteries for HEVs***, PHEVs, and EVs</b></p> <p><b>Opportunity</b> Higher demand for batteries used in EVs and PHEVs</p> <p><b>Opportunity 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 ratio 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> <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.</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>Due to increased storm and flooding damage, there is a risk of greater impact including property damage to facilities and machinery at the company's plants, loss of profit from business suspension, and the inability of workers to report to work. Interruption of supply chains is also anticipated.</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.  
 \*\* 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 12 V lead-acid or lithium-ion batteries for auxiliary equipment used in electric vehicles as well (for new automobiles and for replacement)</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>
	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>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>
	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>Apply automotive lithium-ion battery know-how to industrial applications</b></p> <p>Establish a lineup that includes both lead-acid batteries and lithium-ion batteries for industrial applications according to market needs</p>
	Operations	<p><b>Countermeasures against intensifying disasters</b></p> <ul style="list-style-type: none"> <li>Evaluate future risks including climate risks, implement countermeasures as necessary</li> <li>Undertake BCP including supply chains</li> </ul>	<p><b>Focus on the renewable energy and energy management fields</b></p> <ul style="list-style-type: none"> <li>Strengthen operation, maintenance and inspection services</li> <li>Develop more price-competitive batteries</li> <li>Introduce products and services aligned customer needs to capture demand for renewable energy</li> <li>Capture demand for peak cutting, peak shifting, and other energy management services for business sites</li> </ul>
3°C scenario	Industrial battery and power supply related business	<p><b>Conduct R&amp;D of and commercialize rare metal-free batteries</b></p> <p>Promote R&amp;D on and commercialize rare metal-free batteries such as sulfur cathode batteries</p>	<p><b>Conduct R&amp;D of and commercialize post-lithium-ion batteries</b></p> <p>Promote R&amp;D of all-solid-state batteries and put them into practical application, promote R&amp;D of and commercialize silicon anode batteries, lithium metal anode batteries, and sulfur cathode batteries</p>
	Operations	<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

### [Fifth Mid-Term Management Plan (FY2019–FY2022)]

<p><b>CO<sub>2</sub> emissions</b></p> <p>Reduce by at least <b>6%</b> (compared with FY2018)</p>	<p><b>Water consumption</b></p> <p>Reduce by at least <b>8%</b> (compared with FY2018)</p>
<p><b>Percentage of environmentally considered products in total sales of all products</b></p> <p><b>35.0%</b> or more</p>	<p><b>Ratio of recycled lead used as lead raw materials in lead-acid batteries</b></p> <p><b>35.0%</b> or more</p>

### [GY 2030 Long-Term Greenhouse Gas Target]

<p><b>CO<sub>2</sub> emissions</b></p> <p>Reduce CO<sub>2</sub> emissions by at least <b>30%</b> (compared with FY2018)</p>	<p><b>[Internal Carbon Pricing (ICP)]</b></p> <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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