Achieving a Decarbonized Society

Efforts to Achieve a Decarbonized Society

Hitachi has set out a target to achieve carbon neutrality throughout its value chain by fiscal 2050 among its long-term environmental targets called Hitachi Environmental Innovation 2050 in order to help build a decarbonized society.

In fiscal 2022, we have put in place two green strategies—GX for GROWTH and GX for CORE—and are working to accelerate measures aimed at achieving the target. Under GX for GROWTH, we contribute to decarbonization efforts by our customers and society through the provision of products and services with a low environmental burden. Further, under GX for CORE, we accelerate measures aimed at achieving carbon neutrality at Hitachi business sites (factories and offices) by fiscal 2030.

The majority of our value-chain emissions result from the use of our products and services after they are sold, making this stage of our value chain the key to reducing CO2 emissions.

Environmental Strategy for Achieving a Decarbonized Society

1. Achieve carbon neutrality at our own business sites and production activities (by fiscal 2030)
   - Introduce energy-saving and renewable energy equipment.
   - Procure 100% non-fossil electricity across all business sites.

2. Achieve the world’s highest level of energy conservation in products
   - Achieve energy conservation by developing products that take the environment into consideration from the design stage.

3. Support businesses that contribute to the carbon neutrality of society as a whole
   - Power grids business to support the expansion of renewable energy.
   - Provision of EV systems and related infrastructure and energy-efficient high-speed trains and storage battery hybrid trains for the spread of carbon-free mobility.
   - Provide Lumada solutions that support the realization of a decarbonized society through digitalization.

4. Develop technologies to realize the transition to a decarbonized society
   - Development of high-efficiency products, energy management systems and hydrogen-related technologies.

5. Work with procurement partners toward a decarbonized society
   - Raise awareness, by distributing our Sustainable Procurement Guidelines and Green Procurement Guidelines, and requesting 70% of our procurement partners (procurement spending basis, excluding publicly listed subsidiaries) to formulate CO2 reduction plans.
Expanding the Decarbonization Business

**Approach**  
To help achieve a decarbonized society as set out in Hitachi’s Environmental Vision, Hitachi provides value to customers and society by pursuing a decarbonization business that contributes to the reduction of CO₂ emissions, leveraging collaborative creation with our partners. Hitachi has three major sectors—Green Energy & Mobility, Digital Systems & Services, and Connective Industries—as well as the Hitachi Astemo, automotive business area. We are developing the following businesses that contribute to decarbonization:

- Businesses that help to accelerate the energy shift aimed at realizing decarbonization
- Businesses that provide safe, comfortable, and clean mobility
- Businesses that help to reduce CO₂ emissions by using cutting-edge digital technologies to improve the efficiency of systems that underpin society
- Businesses that help to decarbonize industries and cities by creating a resilient supply chain
- Businesses that contribute to the electrification and autonomous driving of vehicles

We will work to expand our decarbonization business through the provision of these varied solutions, thereby helping the world to mitigate and adapt to climate change.

**Activities**  
- Enhancing energy efficiency of transformers, high voltage products, and power transmission/distribution
- Advancing smart grid control, etc.
- Promoting power generation systems using wind and other non-fossil energy sources
- Enabling energy-saving features of rolling stock
- Developing maintenance service efficiency through rolling stock monitoring
- Enhancing energy-saving features of servers and storage
- Developing smart data centers
- Enhancing energy-saving features of medical devices
- Reducing CO₂ by improving operational efficiency through AD/ADAS solutions

Examples of Decarbonization Business: A Hitachi Focus

- **Power grid solutions**
  - Enhancing efficiency of transformers, high voltage products, and power transmission/distribution
- **Grid automation**
  - Advancing smart grid control, etc.
- **Power generation**
  - Promoting power generation systems using wind and other non-fossil energy sources
- **Railways**
  - Enhancing energy-saving features of rolling stock
  - Developing maintenance service efficiency through rolling stock monitoring
- **Finance and public-oriented solutions**
  - Promoting digital solutions
- **Data centers**
  - Developing smart data centers
- **Servers/storage**
  - Enhancing energy-saving features of servers and storage
- **Smart logistics**
  - Improving energy-saving features through fully IT-enhanced logistics
- **Factory automation**
  - Enhancing energy efficiency through shorter lead times
- **Water business**
  - Enhancing efficiency of water and sewage systems
- **Industrial products**
  - Enhancing efficiency of industrial products
- **Smart cities**
  - Reducing CO₂ through Comprehensive urban energy management solutions
- **Home appliances**
  - Enhancing energy efficiency of home appliances
  - Promoting connected home appliances
- **Smart therapies**
  - Enhancing energy-saving features of medical devices
- **Elevators**
  - Enhancing energy-saving features of elevators and escalators through replacement
  - Enhancing energy efficiency through total building solutions
- **Vehicle electrification**
  - Promoting electrification through electric powertrain systems
- **AD/ADAS (Automatic Driving, Advanced Driver-Assistance Systems)**
  - Reducing CO₂ by improving operational efficiency through AD/ADAS solutions
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Efforts to Reduce CO₂ Emissions During the Use of Products and Services

Approach
Activities
To reduce CO₂ emissions from the use of our products and services, which make up the largest proportion of emissions in our value chain, we have established target reduction rates of CO₂ emissions per unit based on fiscal 2010. For each product or service subject to this initiative, we calculate the reduction rate with CO₂ emissions as the numerator and function size*¹ as the denominator. We will also help our customers and society to reduce CO₂ emissions through the products and services we sell. Hitachi aims to lead the world in decarbonization by making a reduction contribution of approximately 100 million metric tons/year in fiscal 2024 through enhancing power grid resilience and promoting the adoption of renewable energy and advancement of energy conservation throughout society in our aim of realizing a sustainable society.

Approach to Calculating CO₂ Emission Reductions
The Guidelines on Calculating CO₂ Emission Reductions for Hitachi Group Products and Services² specify the following three methods for calculating different types of CO₂ emission reductions. Figures considered reductions for products and services while in use under the GHG Protocol, a standard for calculation and reporting of GHG emission, are calculated using method (1). Methods (2) and (3) are for avoided emissions.

(1) Energy-saving feature enhancements
Set a reduction rate of CO₂ emissions per unit (compared to fiscal 2010) based on efficiency enhancements such as energy-saving feature enhancement in products and services. Every year, calculate reductions in CO₂ emissions considering the production volume of the relevant year.

(2) Reduction through new systems and solutions based on technological innovation
Calculate avoided emissions as reductions in CO₂ emissions due to the dissemination of new systems and solutions that emit less CO₂ while providing equivalent value to existing products, services, and solutions.

(3) Reduction through the deployment of non-fossil energy systems
Calculate avoided emissions as reductions in CO₂ emissions due to the introduction of renewable and other non-fossil energy systems, as compared to existing grid-supplied electricity (using the average emissions factor of the base year, fiscal 2010).

*¹ Major functions of products correlated with CO₂ emissions, such as their output and volume
² The Guidelines are based on various standards, including the Guidance on Quantifying Greenhouse Gas Emission Reductions from the Baseline for Electrical and Electronic Products and Systems (IEC TR62726) issued by the International Electro-technical Commission (IEC), and calculation methods established by governments or industrial associations.

Achieving CO₂ Emission Reductions During the Use of Products and Services

Target Activities
GRI 305-4/305-5
Hitachi set a target for fiscal 2021 of a 21% reduction in CO₂ emissions per unit from products and services compared to the base year of fiscal 2010 and achieved a 28% reduction. The achievement of this target was driven by the introduction of new models of high-energy-saving equipment used in industrial equipment and social infrastructure.

Environmental Action Plan for 2021 Management Values

Reduction in CO₂ Emissions per Unit (Hitachi Group)

FY 2010 (base year)
FY 2021

Reduction in CO₂ emissions from use of products

100%
72%

Function size*¹

From base year 28% reduction
FY 2021 reduction target rate: 21%
Improving the Environmental Performance of Products and Services Through Eco-designs

System | Activities

For all products and services involving a design process, Hitachi promotes eco-designs by applying our Environmentally Conscious Design Assessments to steadily improve environmental performance throughout the Group. We identify 30 environmental impact items that may cause climate change, resource depletion, and ecosystem degradation across the entire life cycle of products and services, assess the level of environmental burden reduction across our business activities in multifaceted ways, and strive to achieve further reductions.

Initiatives for Improving Environmental Performance of Products and Services

- Promoting environmentally conscious processes: In accordance with the IEC 62430*¹ criteria, promote environmentally conscious processes in designing and developing products and services including by meeting environmental regulatory requirements and ascertaining the environment-related needs of our stakeholders within our existing management system.
- Implementing Life Cycle Assessments (LCAs): For our main, priority products, quantitatively evaluate their global environmental burden in such areas as the consumption of mineral resources, fossil fuels, and water resources, as well as their impact on climate change and air pollution, disclose the results to our stakeholders, and utilize them in improving the design of next-generation products.

*¹ The standard developed by the International Electrotechnical Commission (IEC) concerning environmentally conscious design for electrical and electronic products.

[Case studies of Reducing CO₂ Emissions Throughout the Value Chain](https://www.hitachi.com/environment/casestudy/index.html#case01)
Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

In working toward realizing a decarbonized society, Hitachi has set the goal of realizing carbon neutrality by fiscal 2030 at all business sites (factories and offices) as part of its long-term environmental targets called Hitachi Environmental Innovation 2050.

Our roadmap to achieving this goal sets targets of reducing CO₂ emissions by 50%, compared to the base year, by fiscal 2024 and 80% by fiscal 2027 toward realizing carbon neutrality by fiscal 2030.

Approaches to reducing CO₂ emissions include installing energy-saving and renewable energy equipment (including PPAs*) and purchasing electricity from renewable sources, renewable energy certificates,*² and high-quality credits for neutralization (environmental value obtained by removing carbon from the atmosphere). Among these, installing energy-saving and renewable energy equipment is expected to incur high costs relative to the amounts of reduction. However, it will also lead to reduced risks associated with factors including anticipated sharp rises in energy pricing and increased costs from carbon taxes and the expansion of carbon tax transactions. It also aligns with our Corporate Mission—"To contribute to society through the development of superior, original technology and products"—and for this reason as well, we are placing a priority focus on this approach. Currently, we have set the target at a 33% reduction to be made by fiscal 2030, however we are working to increase that level to 50%.

Concrete efforts to achieve carbon neutrality at business sites, categorized by location type (factories, offices), can be outlined as shown below.

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* Power Purchase Agreement (PPA): An arrangement in which a company (PPA provider) that owns and manages solar power generation equipment installs a solar power generation system in a space furnished by a facility owner, such as a lot or rooftop, and the electricity generated by it is supplied to the facility for a fee.

* Renewable energy certificates: Accredits the environmental value associated with electricity generation from renewable energy sources. Unlike the purchase of renewable electricity, acquisition of this environmental value, which is separate from the electricity itself, is regarded as equivalent to reducing CO₂ emissions.
The Hitachi Internal Carbon Pricing Framework

**System**
To promote CO2 reduction at its business sites (factories and offices), in fiscal 2019 Hitachi introduced the Hitachi Internal Carbon Pricing (HICP) framework.

Specifically, with reference to emissions trading and carbon taxes globally, we establish company-interval carbon prices, convert into monetary value the effect of CO2 reductions due to investment in equipment that contributes to decarbonization, add this to the value of energy reduction effects, and use the result to evaluate the effect of our investment. By applying incentives like these, we aim to further expand our investment in equipment that contributes to decarbonization.

Initially, we set the HICP rate at 5,000 yen/t-CO2 in consideration of 2025 carbon taxes and carbon trading prices (ETS*1). Subsequently, looking ahead to 2030, we increased the rate to 14,000 yen/t-CO2 in August 2021 in consideration of anticipated carbon taxes and carbon trading prices. We will leverage this framework to provide early responses to future risks such as carbon taxes as well as to actively promote the installation of energy-saving and renewable energy equipment, our highest priority initiative aimed at achieving carbon neutrality.

Increased burdens from carbon taxes and new emission regulations can be anticipated in the future. Taking such risk factors into account from the stage of equipment investment considerations and making investments that contribute to decarbonization a higher priority will help minimize the impacts of future climate change risks and make our company more resilient. The introduction of the HICP framework is instrumental in this process.

### Achievements in FY 2021
As a result of Hitachi’s creation and implementation of the HICP framework, we have made additional investments in equipment that was previously judged to be effective in reducing CO2 emissions for projects that had not originally received sufficient investment due to their lower levels of investment efficiency.

In fiscal 2021, we invested in 59 cases of energy-saving equipment with a total investment of 1.460 billion yen. These investments contributed to an annual reduction of 1,230 metric tons of CO2 emissions. The annual amount of CO2 emission reductions from our business sites improved 2% compared to the previous fiscal year.

With factors including the revised rate of 14,000 yen/t-CO2, 33% of overall investments contributing to decarbonization were selected through the HICP framework. The scope of investments broadened to include categories such as reducing energy use in production facilities in addition to conventional categories like upgrading to high-efficiency equipment.

### Actions and Achievements
At Hitachi, the achievement of environmental targets for individual business sites (factories and offices) set by the Environmental Action Plan for 2021 is measured by CO2 emissions per unit. Because we conduct business in various sectors, the KPI of CO2 emissions per unit for each business site is calculated using the site’s CO2 emissions as the numerator and its activity amount*1 as the denominator.

In fiscal 2021, which was also the final year of the Environmental Action Plan for 2021, the reduction rate of CO2 emissions per unit was 6% against a target of 9% (compared to the base year of fiscal 2010). Reasons for not reaching the target include an increase in the operation of equipment with high energy consumption in factories and lower production efficiency due to the inability stemming from COVID-19 to procure certain components.

Also, total CO2 emissions increased by approximately 2.6%, or 88 kt-CO2,*2 compared to fiscal 2020. This was influenced by an increase in operations by materials divisions.

*1 Activity amount is a value closely related to CO2 emissions at each business site (for example, production quantity, output, building floor space, and number of employees).

*2 The CO2 electrical power conversion factor for total CO2 emissions is market-based.
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CO₂ emissions reduction rate per unit (Hitachi Group)

FY 2010 (base year) 100%

FY 2021 94%

CO₂ emissions reduction rate per unit at Business Sites (Factories and Offices)

From base year 6% reduction

FY 2021 reduction target: 9%

Notes:
- As with the CO₂ electrical power conversion factor in calculations of CO₂ emissions per unit, a unified factor of 0.530 kg-CO₂/kWh is applied across the entire Hitachi Group.
- The Environmental Action Plan’s management values do not include amounts for our power plants in fiscal 2010 (base year) or fiscal 2021. Emissions, which provide the basis for intensity metrics, are calculated according to the boundary of environmental performance aggregation data for fiscal 2021.
- 1) CO₂ emitted from the organization (SCOPE 1 and 2).
- 2) Activity amount is a value closely related to CO₂ emissions at each business site (for example, production quantity, output, building floor-space, and number of employees).

Achievements in FY 2021

- At ten sites in the United States, Europe, and Japan all the electricity used came from renewable sources.
- Moreover, three Hitachi High-Tech Group sites and one Hitachi Industrial Equipment Systems Group site have achieved carbon neutrality by promoting further enhanced energy-saving and purchasing high-quality credits for neutralization.

Introducing Renewable Energy
Activities

Hitachi is promoting the generation of power through solar, wind, and other forms of renewable energy at its business sites. We are advancing related efforts with the aim of raising the share of this power in our total electricity consumption to 5% by fiscal 2030.

As well, for electricity we purchase, we are also offsetting any CO₂ emissions that cannot be reduced through energy-saving and renewable energy equipment by adopting the use of electricity from renewable sources. Going forward, we plan to reduce the total amount of electricity acquired by promoting even greater energy-saving. Renewable electricity used will be based on the standards set by the GHG Protocol.

Renewable energy generation across the Hitachi Group in fiscal 2021 increased by 36% compared to fiscal 2020, accounting for 0.7% of the electricity consumed by the entire Hitachi Group. Also, the amount of purchased renewable electricity used by the Hitachi Group in fiscal 2021 increased by 36% compared to fiscal 2020, accounting for 3.4% of the electricity consumed by the entire Hitachi Group.

Together, generated and purchased renewable electricity accounted for 4.1% of the electricity consumed by the entire Hitachi Group in fiscal 2021.

At ten sites in the United States, Europe, and Japan all the electricity used came from renewable sources. Moreover, three Hitachi High-Tech Group sites and one Hitachi Industrial Equipment Systems Group site have achieved carbon neutrality by promoting further enhanced energy-saving and purchasing high-quality credits for neutralization.
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Business Sites Fully Powered by Renewable Electricity

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Number of Sites</th>
<th>Renewable Energy Use (MWh)</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hitachi Computer Products (US)</td>
<td>1 site</td>
<td>11,263 (wind power)</td>
<td>—</td>
</tr>
<tr>
<td>Hitachi Rail Italy</td>
<td>3 sites</td>
<td>31,635 (hydroelectric power, etc.)</td>
<td>—</td>
</tr>
<tr>
<td>Hitachi Astemo (UK)</td>
<td>1 site</td>
<td>3,954 (hydroelectric power, etc.)</td>
<td>—</td>
</tr>
<tr>
<td>Hitachi High-Tech Group (Japan)</td>
<td>3 sites</td>
<td>11,104 (hydroelectric and wind power)</td>
<td>carbon neutrality</td>
</tr>
<tr>
<td>Hitachi Industrial Equipment Systems Group (US)</td>
<td>1 site</td>
<td>11,171 (wind power)</td>
<td>carbon neutrality</td>
</tr>
<tr>
<td>Hitachi Construction Machinery Group (Japan)</td>
<td>1 site</td>
<td>11,702 (wind and solar power)</td>
<td>—</td>
</tr>
<tr>
<td>Total</td>
<td>10 sites</td>
<td>80,829</td>
<td></td>
</tr>
</tbody>
</table>

Reducing Transportation Energy Consumption

As part of its efforts to reduce energy output during transportation as well as at its business sites (factories and offices), Hitachi has established targets for the reduction of transportation energy use per unit for each business unit and Group company in Japan.

Outside Japan these targets are voluntary. Our business sites are promoting a modal shift to highly efficient transportation methods by improving truck loading ratios, taking other measures to reduce transportation energy consumption and switching to the use of eco-cars for in-house operations.

Eco Rail Mark Certification and Initiatives

Considering a modal shift from truck to rail transportation a high priority, we are working toward “Eco Rail Mark company” and “Eco Rail certified product” certifications from the Ministry of Land, Infrastructure, Transport, and Tourism.

Transitioning from truck to railway transportation is expected to reduce CO2 emissions per unit to one-thirteenth of its current level, and we plan to continue expanding our use of railways for long-distance transportation.

Eco Rail Mark Initiatives

<table>
<thead>
<tr>
<th>Company</th>
<th>Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hitachi, Ltd.</td>
<td>Eco Rail Mark company<em>1, Eco Rail certified product</em>2</td>
</tr>
<tr>
<td>Hitachi Channel Solutions</td>
<td>Eco Rail Mark company*1</td>
</tr>
<tr>
<td>Hitachi Industrial Equipment Systems</td>
<td>Eco Rail certified product*2</td>
</tr>
</tbody>
</table>

*1 A mark conferred on companies using railways for more than 15% of freight land transportation covering 500 km or more; for 15,000 metric tons or more in volume per year; or for more than 15 million ton-kilometers in volume x distance per year.

*2 A mark conferred on products using railways for more than 30% of freight land transportation covering 500 km or more in terms of volume x distance.

Achievements in FY 2021

To reduce CO2 emissions in fiscal 2021, we focused on improving efficiency when loading products for transportation, increasing the use of coordinated transportation, and optimizing transport vehicles. However, due to increased production by our materials divisions and construction machinery divisions, CO2 emissions from transportation within Japan totaled 74.3kt-CO2, an increase of 5.4kt-CO2, or 7%, compared to fiscal 2020.
Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

In June 2018, Hitachi announced its endorsement of the recommendations by the Financial Stability Board’s (FSB) Task Force on Climate-related Financial Disclosures (TCFD). The following contains key climate-related financial information in line with the TCFD’s recommendations.

**Governance**

Hitachi sees climate change and other environmental issues as important management issues. Important matters concerning the Group’s sustainability strategy, including climate change measures, are discussed and decided on by the Senior Executive Committee and are presented to the Board of Directors according to necessity.

Hitachi’s long-term environmental targets called Environmental Innovation 2050, which include reducing CO2 emissions, were reviewed and approved by the Board of Directors when they were established and revised, and then shared with the public.

In addition, the Audit Committee of independent directors conducts an audit of sustainability-related operations once a year, and Hitachi executive officers report on climate-related issues to the committee during the audit.

As for TCFD initiatives outside the company, since 2019 Hitachi has participated in the TCFD Study Group on Green Finance and Corporate Disclosures arranged by Japan’s Ministry of Economy, Trade and Industry (METI). In addition, we have participated in the TCFD Consortium, which holds discussions on efforts to link companies’ effective information disclosure and the information they disclose with appropriate investment decisions by financial institutions and others, as a Steering Committee member and contributed to their guidance formulation.

**Strategy**

We are responding to climate change by fulfilling our responsibilities as a global company by helping to achieve a decarbonized society. Under the RCP 2.6*1 and RCP 8.5*2 scenarios of the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), we established long-term environmental targets called Hitachi Environmental Innovation 2050—as a transition plan to a decarbonized society—in fiscal 2016 under our Environmental Vision. Moreover, in order to help limit the global temperature rise to 1.5°C as recommended in the IPCC Global Warming of 1.5°C report, in fiscal 2020 we revised our target to achieve carbon neutrality at Hitachi factories and offices by fiscal 2030. And then in fiscal 2021 we revised our target again to achieve carbon neutrality in our value chain by fiscal 2050.

Our aim is to help create a decarbonized society, and we work to achieve the ambitious targets to realize that goal.

As for TCFD initiatives outside the company, since 2019 Hitachi has participated in the TCFD Study Group on Green Finance and Corporate Disclosures arranged by Japan’s Ministry of Economy, Trade and Industry (METI). In addition, we have participated in the TCFD Consortium, which holds discussions on efforts to link companies’ effective information disclosure and the information they disclose with appropriate investment decisions by financial institutions and others, as a Steering Committee member and contributed to their guidance formulation.

**Identification and Assessment of Climate-related Risks and Opportunities**

The Hitachi Group operates a broad array of businesses around the world with each business having its own set of risks and opportunities. We are responding to the impact of climate change by assessing climate-related risks and opportunities in accordance with TCFD classifications. We make sector-specific assessments of risks and opportunities for important business sectors that have a relatively high likelihood of being affected by climate change. Our assessments are also categorized according to time span, namely short term, medium term, and long term as defined below.

**Time Spans for Assessing Climate-related Risks and Opportunities**

<table>
<thead>
<tr>
<th>Time span</th>
<th>Reason for adoption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short term</td>
<td>Corresponds to the three-year management period covered by the Environmental Action Plan for 2024 established in line with the 2024 Mid-term Management Plan</td>
</tr>
<tr>
<td>Medium term</td>
<td>Time span of our fiscal 2030 long-term environmental targets</td>
</tr>
<tr>
<td>Long term</td>
<td>Time span of our fiscal 2050 long-term environmental targets</td>
</tr>
</tbody>
</table>

**Degrees of Impact**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major</td>
<td>Has an impact sufficient to disrupt business or cause it to substantially decrease or increase</td>
</tr>
<tr>
<td>Medium</td>
<td>Part of the business is impacted</td>
</tr>
<tr>
<td>Minor</td>
<td>There is little impact</td>
</tr>
</tbody>
</table>
Responding to Climate Scenario Risks and Opportunities for Each Business

Hitachi operates a broad array of businesses with each business having its own set of risks and opportunities. We therefore selected businesses that have a relatively high likelihood of being affected by climate change and conducted scenario analyses on them. In selecting the businesses, we took into account the factors of, high sales volume within the Group, and relatively high need for fossil fuels when products and services are used, as well as high CO2 emissions.

The businesses we selected were railway systems, power generation and power grids, IT systems, industrial equipment, automotive systems, and construction machinery. For each of these businesses, we considered the business environment under the 1.5°C and 4°C scenarios and how we would respond.

### 1.5°C scenario

As projected by the IPCC’s RCP 2.6 climate model, the IEA 450 Scenario, and other scenarios, we are anticipating a world where stringent measures and regulations will be implemented to help realize a decarbonized society. Therefore, we investigated risks and opportunities on the premise of carbon neutrality by fiscal 2050.

### 4°C scenario

We focused on there being increased climate-induced natural disasters as a result of lax regulations as projected by the IPCC’s RCP8.5 scenario and other scenarios.

Our assessment of the major risks and opportunities for the selected businesses are outlined in the following table.

<table>
<thead>
<tr>
<th>Target businesses</th>
<th>Railway systems</th>
<th>Power generation and power grids</th>
<th>IT systems</th>
<th>Industrial equipment</th>
<th>Automotive systems</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risks</strong></td>
<td>Competitiveness will decline if there are delays in the development of innovative emission-reducing technologies including those to improve the efficiency of railway services through digital utilization such as dynamic headway (flexible operations in response to passenger demand) and new mobility services like Moa.</td>
<td>Delays in the construction of power networks that emit less CO2 per distance covered will grow with tighter CO2 emission regulations in each country and region.</td>
<td>Business environment will decline if there are delays in the development of high-efficiency, low-loss products.</td>
<td>Competitiveness will decline if there are delays in the development of high-efficiency, low-loss products.</td>
<td>Delay transition to a new business environment caused by rapidly development of internal combustion engine vehicles will potentially decline sales.</td>
</tr>
<tr>
<td><strong>Opportunities</strong></td>
<td>Business opportunities will grow with rising demand for renewable energy—the key to a decarbonized future—and with the provision of grid solutions, digital service solutions, and energy platforms that can accommodate the decarbonization of energy suppliers.</td>
<td>Demand for electricity generated from renewable energy, nuclear power, and other non-fossil sources will grow with tighter CO2 emission regulations in each country and region. Power networks will increasingly accommodate natural energy produced through distributed generation.</td>
<td>Business opportunities will grow with rising demand for energy-saving and high-efficiency IT solutions and also if decarbonized measures for energy-intensive data centers are delayed.</td>
<td>Competitiveness will decline if there is a lack of technological and human resource development to provide energy-saving and highly efficient IT solutions and also if decarbonized measures for energy-intensive data centers are delayed.</td>
<td>Expanding market for electric, hydrogen, and biofuel vehicles including motorcycles to replace internal combustion engine vehicles.</td>
</tr>
<tr>
<td><strong>Introduction</strong></td>
<td>Global demand for transport systems that emit less CO2 per distance covered will grow with tighter CO2 emission regulations in each country and region.</td>
<td>Global demand for electricity generated from renewable energy, nuclear power, and other non-fossil sources will grow with tighter CO2 emission regulations in each country and region.</td>
<td>Global demand for energy-saving, high-efficiency IT solutions will grow with tighter CO2 emission regulations in each country and region.</td>
<td>Global demand for energy-saving, high-efficiency IT solutions will grow with tighter CO2 emission regulations in each country and region.</td>
<td>Global demand for electric automobiles will rapidly spread with tighter laws and regulations on fuel efficiency and environmental standards, and increases in fossil fuel prices. Markets for alternative non-fossil technologies like hydrogen and biofuel vehicles will expand. The number of countries and regions with near-zero sales of internal combustion engine vehicles will increase.</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>Climate-related Financial Information Disclosure (Based on TCFD Recommendations)</td>
<td>Contributing to a Decarbonized Society Through the Decarbonization Business</td>
<td>Contributing to a Decarbonized Society at Business Sites (Factories and Offices)</td>
<td>Achieving a Resource Efficient Society</td>
<td>Achieving a Harmonized Society with Nature</td>
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- Non-environmental market factors (neither the 1.5°C nor 4°C scenario)
  - Economic growth will lead to urbanization and population growth around the world which will drive the railway business globally as an efficient form of public transport for large numbers of passengers regardless of climate conditions. Market size in Japan will remain flat, but the Asian market overall will see substantial growth.
  - Long-distance transport will decline going forward as the global pandemic restricts travel and encourages remote work. Although the decline in demand will not be as severe as that for air transport, competition will grow as major railway manufacturers in various countries will expand their businesses to meet global demand.
  - Economic growth, urbanization, and population growth will push up demand for energy, especially electricity, in developing countries.
  - Energy supply and demand will diversify due to various factors, such as CO2 emissions, the environmental burden, economic performance, safety, and supply stability.
  - Digital technology will be further applied to enhance the stability and efficiency of the power supply.
  - Further digitalization globally will exponentially increase the volume of data circulated, accumulated, and analyzed. Experience with the global pandemic will prompt a shift to remote, noncontact, and online formats, both in our life and work and will boost demand for digital solutions that facilitate such a shift.
  - New services and businesses utilizing big data, IoT, AI, and other digital technology will expand.
  - Digitalization, infrastructure renewal, population decline, and worker shortages will expand the automation market in industrial countries.
  - As the global pandemic forces people to stay at or work from home, demand will grow for factory automation enabling a handful of workers to operate a factory.
  - The industrial market in emerging economies will grow due to a rise in production plants.

- Power generation and power grids
  - Demand for electric-powered transport will gradually increase even without tighter energy regulations. Damage from typhoons, floods, and other natural disasters caused by climate change will rise sharply.
  - The high frequency of natural disasters will exacerbate damage to production facilities, women working environments, and disrupt supply chains leading to delays in deliveries and the procurement of parts.
  - The high frequency of natural disasters will increase damage to power generation and transmission/distribution facilities, hamper efforts to restore power transmission/distribution, and disrupt supply chains leading to delays in deliveries and the procurement of parts.
  - Natural disasters will exacerbate damage to production facilities, women working environments, and disrupt supply chains leading to delays in deliveries and the procurement of parts.
  - Natural disasters will exacerbate damage to production facilities, women working environments, and disrupt supply chains leading to delays in deliveries and the procurement of parts.

- Railway systems
  - Demand for new, high-efficiency technology will expand as multiple IT systems in response to natural disaster BCPs will result in increased energy consumption. Demand will also grow for social and public systems to reduce damage from natural disasters.
  - Natural disasters will exacerbate damage to production facilities, women working environments, and disrupt supply chains leading to delays in deliveries and the procurement of parts.
  - Natural disasters will exacerbate damage to production facilities, women working environments, and disrupt supply chains leading to delays in deliveries and the procurement of parts.

- IT systems
  - Energy demand will grow as warmer weather leads to increased use of air conditioning. Demand will increase for disaster-resistant power generation and transmission/distribution technologies.
  - Energy demand will increase for social and public systems that help reduce damage from natural disasters and for IT systems required as part of BCP.

- Industrial equipment
  - Natural disasters will exacerbate damage to production facilities, women working environments, and disrupt supply chains leading to delays in deliveries and the procurement of parts.

- Automotive systems
  - Natural disasters will exacerbate damage to production facilities, women working environments, and disrupt supply chains leading to delays in deliveries and the procurement of parts.

- Environmental
  - Fuel efficiency laws and regulations will remain in effect globally, and internal combustion engine vehicles will remain a major mode of transport. The modal shift will be slow as conventional automobiles and motorcycles will remain predominant. Typhoons, floods, and other natural disasters caused by climate change will rise sharply.

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<table>
<thead>
<tr>
<th>Financial information (sales volume of each target sector)</th>
<th>Target businesses</th>
<th>Railway systems</th>
<th>Power generation and power grids</th>
<th>IT systems</th>
<th>Industrial equipment</th>
<th>Automotive systems</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental</strong></td>
<td><strong>Response to future business risks (business opportunities)</strong></td>
<td><strong>Response to business risks under 1.5°C or 4°C scenarios</strong></td>
<td><strong>Response to business risks under 1.5°C or 4°C scenarios</strong></td>
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<td><strong>Response to business risks under 1.5°C or 4°C scenarios</strong></td>
</tr>
<tr>
<td><strong>Financial information (sales volume of each target sector)</strong></td>
<td><strong>Partial impact on the revenue of the railway systems business, which accounted for approximately 6.1% of Hitachi’s revenue at 638.9 billion yen in fiscal 2021</strong></td>
<td><strong>Partial impact on the revenue of the Energy Sector, which accounted for approximately 14.1% of Hitachi’s revenue at 1,447.9 billion yen in fiscal 2021</strong></td>
<td><strong>Partial impact on the revenue of the IT Sector, which accounted for approximately 21.0% of Hitachi’s revenue at 2,153.6 billion yen in fiscal 2021</strong></td>
<td><strong>Partial impact on the revenue of the IT Sector, which accounted for approximately 4.0% of Hitachi’s revenue at 409.4 billion yen in fiscal 2021</strong></td>
<td><strong>Partial impact on the revenue of the automotive business (Hitachi Autos), which accounted for approximately 15.6% of Hitachi’s revenue at 1,597.7 billion yen in fiscal 2021</strong></td>
<td><strong>Partial impact on the revenue of the automotive business (Hitachi Autos), which accounted for approximately 15.6% of Hitachi’s revenue at 1,597.7 billion yen in fiscal 2021</strong></td>
</tr>
</tbody>
</table>

Note: The above scenario analyses are not future projections but attempts to examine our resilience to climate change. How the future unfolds may be quite different from any of these scenarios.
Climate-related Risks (Hitachi Group)

Based on a business-by-business review, Hitachi did not find any significant climate change-related risks that were difficult to respond to.

When considering whether existing businesses will be viable when a decarbonized society is realized, many businesses that use electricity as their energy source would be able to adapt to a decarbonized society by replacing the electricity they use with electricity derived from non-fossil energy sources. On the other hand, it is expected that businesses that currently use fossil fuels will need to adapt to a decarbonized society by adopting new technologies such as hydrogen and biomass, as well as various measures to offset CO2 emissions. Since many of Hitachi’s businesses use electricity, it is clear that there is little significant risk arising from the unavailability of fossil fuels.

Below is a summary of Hitachi’s overall risks under the 1.5°C scenario and the 4°C scenario. Given Hitachi’s business form, we have determined that these risks related to climate change can be addressed.

<table>
<thead>
<tr>
<th>(1) Risks related to the transition to a decarbonized economy (applying mostly to the 1.5°C scenario)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category</strong></td>
</tr>
<tr>
<td>Policy and legal</td>
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<tr>
<td></td>
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<tr>
<td>Technology</td>
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<td></td>
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<tr>
<td>Market and reputation</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>(2) Risks related to the physical impacts of climate change (4°C scenario)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category</strong></td>
</tr>
<tr>
<td>Acute and chronic physical risks</td>
</tr>
</tbody>
</table>
Climate-related Opportunities (Hitachi Group)

To achieve the CO2 reduction targets set forth in our long-term environmental targets and 2024 Mid-term Management Plan, it is important not only to decarbonize our business sites (factories and offices) but also to reduce CO2 emissions from the use of products and services sold, which account for a large portion of emissions in the entire value chain. Developing and providing products and services that emit zero or very little CO2 during their use will not only satisfy customer needs but also help meet society’s demands for reduced emissions. This represents a business opportunity for us in the short, medium, and long term and constitutes a major pillar of the Social Innovation Business that we are promoting as a management strategy.

<table>
<thead>
<tr>
<th>Category</th>
<th>Major risks</th>
<th>Impact</th>
<th>Main initiatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute and chronic physical risks</td>
<td>Increased corporate value and revenue from expanded sales of products and services with innovative technology that can contribute to the mitigation and adaptation of climate change</td>
<td>Medium</td>
<td>• Expand business areas that contribute to decarbonization;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Promote decarbonized solutions and services through collaborative initiatives with customers;</td>
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<td></td>
<td></td>
<td></td>
<td>• Focusing on the fields of energy, mobility, and industry, we are promoting greater utilization of digital technology (Green by Digital) and developing products that offer world-class efficiency.</td>
</tr>
<tr>
<td>Resilience</td>
<td>Provision of solutions to address climate-related natural disasters</td>
<td>Medium</td>
<td>• Providing disaster prevention solutions such as high-performance firefighting command systems</td>
</tr>
</tbody>
</table>

Based on the various reviews, Hitachi did not find any significant climate change-related risks that were difficult to respond to.

Hitachi believes that it has high resilience in the transition to a decarbonized society in the medium- to long-term, as it closely monitors market trends and will develop its business flexibly and strategically under both the 1.5°C and 4°C scenarios.
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**Risk Management**

Hitachi evaluates and monitors climate-related risks for each business unit and Group company as part of a process of assessing risks and opportunities. The results are tabulated by the Sustainability Promotion Division of Hitachi, Ltd., and those risks and opportunities perceived as being particularly important for the Group as a whole are deliberated and decided by the Senior Executive Committee and, if necessary, deliberated by the Board of Directors.

**Metrics and Targets**

Hitachi defines medium- to long-term metrics and targets in the Hitachi Environmental Innovation 2050 long-term environmental targets. It also establishes and manages short-term metrics and targets in detail every three years through the Environmental Action Plan.

Metrics for climate change mitigation and adaptation use total CO2 emissions and the reduction rate in CO2 emissions per unit. Total CO2 emissions from the use of sold products in SCOPE 3, which account for most of our emissions given the nature of Hitachi’s business, fluctuate greatly due to changes in sales volumes and our business portfolio. This has the disadvantage of making it difficult to see the results of energy saving and efficiency improvements. Therefore, we have established CO2 emissions per unit as a metric for providing customers and society with products and services that emit less CO2 for those featuring equivalent value. We also set and manage a metric for avoided emissions that contribute to the realization of a decarbonized society as a whole.

We continue to reduce CO2 emissions generated at our own business sites (factories and offices) by utilizing the Hitachi Internal Carbon Pricing (HICP) system, which provides incentives for capital investments that contribute to CO2 reductions. The carbon price for HICP is set at 14,000 yen per ton-CO2.

In addition, in April 2021, Hitachi, Ltd., introduced evaluations that take environmental value into account in the executive compensation system with a view to accelerating the creation of environmental value toward achievement of its long-term environmental targets. In addition, we plan to put approximately 500 billion yen toward the energy shift, the electrification of vehicles, and so on over the next three years from now to fiscal 2024 as R&D investments to create green value.