

3

Environmental

Environmental

Executive Summary

Advancing Our Environmental Vision and Long-Term Environmental Targets

Environmental Governance

➤ **Achieving a Decarbonized Society**

– Efforts to Achieve a Decarbonized Society

Contributing to a Decarbonized Society Through the Decarbonization Business

Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

Achieving a Resource Efficient Society

Achieving a Harmonized Society with Nature

Environmental Data

// Achieving a Decarbonized Society

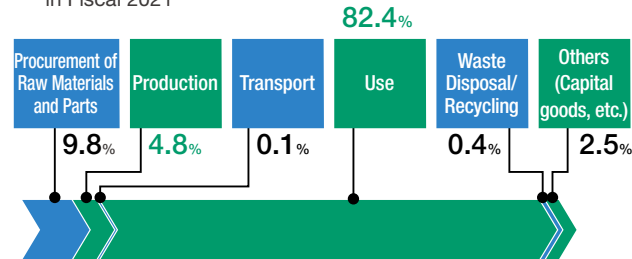
Efforts to Achieve a Decarbonized Society Approach

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.

▶ Ratio of CO₂ Emissions at Each Stage of Hitachi Value Chain in Fiscal 2021



* Percentages may fluctuate due to changes in our business portfolios

Note: Hitachi normally refers to its suppliers (including vendors or providers) as “procurement partners” who build business together on an equal footing.

Environmental Strategy for Achieving a Decarbonized Society

Target Activities

Toward a Decarbonized Society

- Achieve carbon neutrality by fiscal 2050 through the value chain and reduce CO₂ emissions by 50% by fiscal 2030 (compared to fiscal 2010)
- Achieve carbon neutrality at business sites (factories and offices) by fiscal 2030

Initiatives 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

P042 Expanding the Decarbonization Business

P045 CO₂ Emission Reduction at Business Sites (Factories and Offices) and Hitachi Carbon Neutrality 2030

P132 Responsible Procurement

[Hitachi Integrated report 2022 / Green Strategy \(P29-33\)](#)

<https://www.hitachi.com/IR-e/library/integrated/>

3

Environmental

Environmental

Executive Summary

Advancing Our Environmental Vision and Long-Term Environmental Targets

Environmental Governance

➤ **Achieving a Decarbonized Society**

Efforts to Achieve a Decarbonized Society

– Contributing to a Decarbonized Society Through the Decarbonization Business

Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

Achieving a Resource Efficient Society

Achieving a Harmonized Society with Nature

Environmental Data

Contributing to a Decarbonized Society Through the Decarbonization Business

Expanding the Decarbonization Business

Approach	Activities
	<p>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:</p> <ul style="list-style-type: none"> • 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 <p>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.</p>

▶ Examples of Decarbonization Business: A Hitachi Focus

<p>Green Energy & Mobility</p>	<p>Power grid solutions</p> <ul style="list-style-type: none"> • Enhancing efficiency of transformers, high voltage products, and power transmission/distribution
	<p>Grid automation</p> <ul style="list-style-type: none"> • Advancing smart grid control, etc.
	<p>Power generation</p> <ul style="list-style-type: none"> • Promoting power generation systems using wind and other non-fossil energy sources
<p>Digital Systems & Services</p>	<p>Railways</p> <ul style="list-style-type: none"> • Enhancing energy-saving features of rolling stock • Developing smart operating systems • Enhancing maintenance service efficiency through rolling stock monitoring
	<p>Finance and public-oriented solutions</p> <ul style="list-style-type: none"> • Promoting digital solutions
	<p>Data centers</p> <ul style="list-style-type: none"> • Developing smart data centers
<p>Connective Industries</p>	<p>Servers/storage</p> <ul style="list-style-type: none"> • Enhancing energy-saving features of servers and storage
	<p>Smart logistics</p> <ul style="list-style-type: none"> • Improving energy-saving features through fully IT-enhanced logistics
	<p>Factory automation</p> <ul style="list-style-type: none"> • Enhancing energy efficiency through shorter lead times
<p>Hitachi Astemo (Automotive business)</p>	<p>Water business</p> <ul style="list-style-type: none"> • Enhancing efficiency of water and sewage systems
	<p>Industrial products</p> <ul style="list-style-type: none"> • Enhancing efficiency of industrial products
	<p>Smart cities</p> <ul style="list-style-type: none"> • Reducing CO₂ through comprehensive urban energy management solutions
	<p>Home appliances</p> <ul style="list-style-type: none"> • Enhancing energy efficiency of home appliances • Promoting connected home appliances
	<p>Smart therapies</p> <ul style="list-style-type: none"> • Enhancing energy-saving features of medical devices
	<p>Elevators</p> <ul style="list-style-type: none"> • Enhancing energy-saving features of elevators and escalators through replacement • Enhancing energy efficiency through total building solutions
	<p>Vehicle electrification</p> <ul style="list-style-type: none"> • Promoting electrification through electric powertrain systems
	<p>AD/ADS (Automatic Driving, Advanced Driver-Assistance Systems)</p> <ul style="list-style-type: none"> • Reducing CO₂ by improving operational efficiency through AD/ADAS solutions

3

Environmental

Environmental

Executive Summary

Advancing Our Environmental Vision and Long-Term Environmental Targets

Environmental Governance

➤ **Achieving a Decarbonized Society**

Efforts to Achieve a Decarbonized Society

– Contributing to a Decarbonized Society Through the Decarbonization Business

Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

Achieving a Resource Efficient Society

Achieving a Harmonized Society with Nature

Environmental Data

Efforts to Reduce CO₂ Emissions During the Use of Products and Services

Approach	Activities
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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 Services*² 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

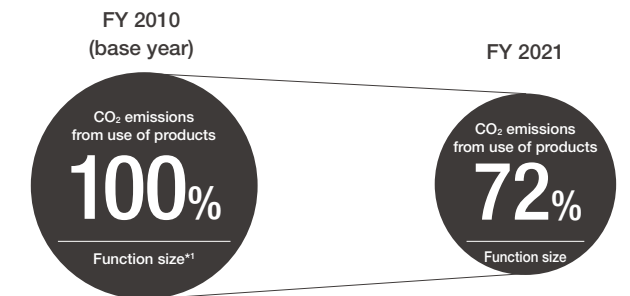
Target	Activities
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GRI 305-4/305-5

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)



Reduction in CO₂ emissions per unit (Hitachi Group)

From base year **28% reduction**
 FY 2021 reduction target rate: 21%

3

Environmental

Environmental

Executive Summary

Advancing Our Environmental Vision and Long-Term Environmental Targets

Environmental Governance

➤ Achieving a Decarbonized Society

Efforts to Achieve a Decarbonized Society

– Contributing to a Decarbonized Society Through the Decarbonization Business

Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

Achieving a Resource Efficient Society

Achieving a Harmonized Society with Nature

Environmental Data

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)

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3

Environmental

Environmental

Executive Summary

Advancing Our Environmental Vision and Long-Term Environmental Targets

Environmental Governance

Achieving a Decarbonized Society

Efforts to Achieve a Decarbonized Society

Contributing to a Decarbonized Society Through the Decarbonization Business

Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

Achieving a Resource Efficient Society

Achieving a Harmonized Society with Nature

Environmental Data

Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

CO₂ Emission Reductions at Business Sites (Factories and Offices) and Hitachi Carbon Neutrality 2030

Policy | **Activities**

GRI 305-4/305-5

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.

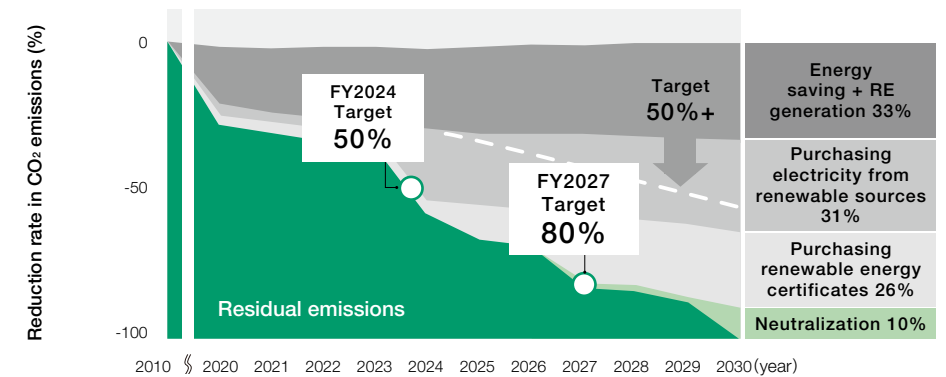
Our roadmap to achieving this goal sets targets of reducing CO₂ emissions by 50%, compared to the base year, by fiscal 2024 and 80% by fiscal 2027 toward realizing carbon neutrality by fiscal 2030.

Approaches to reducing CO₂ emissions include installing energy-saving and renewable energy equipment (including PPAs^{*1}) 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%.

^{*1} 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.

^{*2} Renewable energy certificate: 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.

CO₂ reduction roadmap (as of Mar. 2022)



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

Major Initiatives for Reducing CO₂ Emissions at Business Sites (Factories and Offices)

Factories	<ul style="list-style-type: none"> Improve equipment efficiency by introducing and upgrading to high-efficiency equipment (Determine priority measures and manage introduction and upgrade rates) Improve production efficiency and energy use efficiency during production through use of the Lumada platform and production technologies cultivated from our long years of experience Optimize equipment operations and reduce wasted energy by installing smart meters Review product designs and processes Optimize control of equipment operations in response to production conditions
Offices	<ul style="list-style-type: none"> Build/move to new facilities with high energy efficiency Combine and integrate existing facilities Install energy-saving equipment and optimize equipment operations in collaboration with building owners
Factories and offices	<ul style="list-style-type: none"> Install renewable energy systems Use electricity from renewable sources Adopt renewable energy certificate systems Introduce off-balance-sheet solar power generation for self-consumption Promote investment in carbon-reduction equipment through adoption of the Hitachi Internal Carbon Pricing (HICP) framework

3

Environmental

- Environmental
- Executive Summary
- Advancing Our Environmental Vision and Long-Term Environmental Targets
- Environmental Governance

➤ Achieving a Decarbonized Society

- Efforts to Achieve a Decarbonized Society
- Contributing to a Decarbonized Society Through the Decarbonization Business
- Contributing to a Decarbonized Society at Business Sites (Factories and Offices)
- Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

Achieving a Resource Efficient Society

Achieving a Harmonized Society with Nature

Environmental Data

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*¹ (HICP) framework.

Specifically, with reference to emissions trading and carbon taxes globally, we establish company-internal 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 (ETS²). 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.

*1 Internal carbon pricing: An in-house tool for assessing in monetary terms the amount of carbon generated or reduced in order to voluntarily make investment decisions and conduct risk management.

*2 Emission Trading Scheme

Achievements in FY 2021

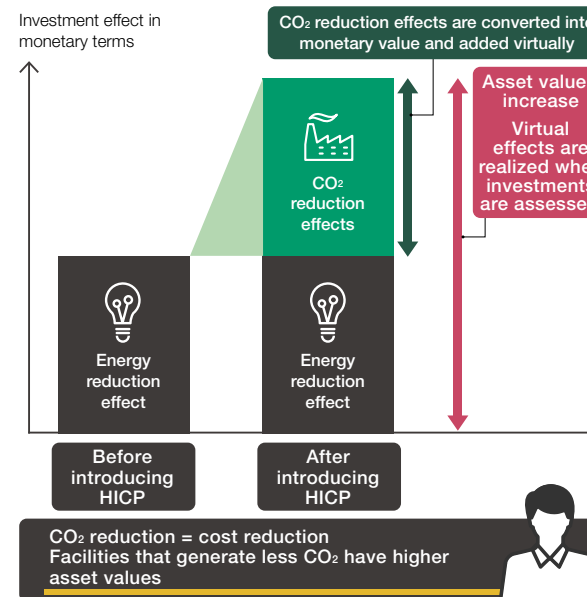
As a result of Hitachi's creation and implementation of the HICP framework, we have made additional investments in equipment that was previously judged to be effective in reducing CO₂ emissions for projects that had not originally received sufficient investment due to their low levels of investment efficiency.

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.

Hitachi Internal Carbon Pricing (HICP) Framework

Approach to Assessing Investment Effectiveness with HICP



Actions and Achievements

Activities

GRI 302-1/305-4/305-5

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 amount¹ 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

3

Environmental

Environmental

Executive Summary

Advancing Our Environmental Vision and Long-Term Environmental Targets

Environmental Governance

➤ Achieving a Decarbonized Society

Efforts to Achieve a Decarbonized Society

Contributing to a Decarbonized Society Through the Decarbonization Business

– Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

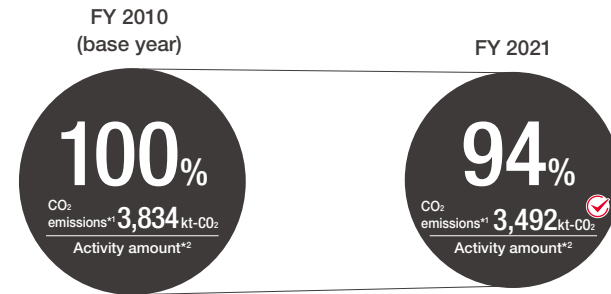
Achieving a Resource Efficient Society

Achieving a Harmonized Society with Nature

Environmental Data

Environmental Action Plan for 2021 Management Values

CO₂ emissions reduction rate per unit (Hitachi Group)



CO₂ emissions reduction rate per unit at Business Sites (Factories and Offices) **6% reduction** From base year
 FY 2021 reduction target: 9%

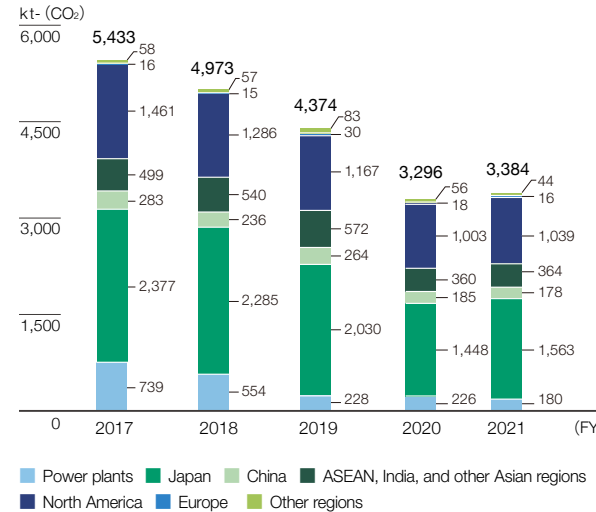
Notes: • As with the CO₂ electrical power conversion factor in calculations of CO₂ emissions per unit, a unified factor of 0.530 kg-CO₂/kWh is applied across the entire Hitachi Group.

• 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 base 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).

CO₂ Emissions (Hitachi Group's factories, offices, and power plants)



Notes: • Regarding CO₂ electrical power conversion factors: in Japan (including power plants), adjusted conversion factors for individual power businesses based on the Act on Promotion of Global Warming Countermeasures are used; outside of Japan, the latest values for each fiscal year supplied by the International Energy Agency (IEA) for individual countries and by power supply companies are used.

• Energy-related CO₂ emissions in fiscal 2021 were 1,245 kt-CO₂ (SCOPE 1) and 2,139 kt-CO₂ (SCOPE 2, market-based).

• In addition to this figure, the fiscal 2021 CO₂ emissions of an energy-related company and automotive business companies, which became consolidated subsidiaries in fiscal 2020, were 175 kt-CO₂ and 601 kt-CO₂, respectively. The companies' CO₂ emissions will be incorporated into the Hitachi Group's CO₂ emissions from fiscal 2022.

• 3.2 kt-CO₂ through the use of carbon-neutral city gas*1 and 3.6 kt-CO₂ achieved with credits for neutralization are excluded from SCOPE 1.

*1 Carbon-neutral city gas: A type of liquefied natural gas for which greenhouse gases generated through processes from the extraction to the combustion of the natural gas are offset with carbon neutralization credits so that it can be regarded as equivalent to generating no CO₂ on a global scale.

P067 Calculating GHG Emissions Throughout the Value Chain (Fiscal 2021)

P069 Environmental Load from Operations

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.

Achievements in FY 2021

Renewable electricity generation across the Hitachi Group in fiscal 2021 increased by 56% 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.

3

Environmental

Environmental

Executive Summary

Advancing Our Environmental Vision and Long-Term Environmental Targets

Environmental Governance

Achieving a Decarbonized Society

Efforts to Achieve a Decarbonized Society

Contributing to a Decarbonized Society Through the Decarbonization Business

Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

Achieving a Resource Efficient Society

Achieving a Harmonized Society with Nature

Environmental Data

Business Sites Fully Powered by Renewable Electricity

Hitachi Computer Products (US)	1 site	11,263 MWh (wind power)	—
Hitachi Rail Italy	3 sites	31,635 MWh (hydroelectric power, etc.)	—
Hitachi Astemo (UK)	1 site	3,954 MWh (hydroelectric power, etc.)	—
Hitachi High-Tech Group (Japan)	3 sites	11,104 MWh (hydroelectric and wind power)	carbon neutrality
Hitachi Industrial Equipment Systems Group (US)	1 site	11,171 MWh (wind power)	carbon neutrality
Hitachi Construction Machinery Group (Japan)	1 site	11,702 MWh (wind and solar power)	—
Total	10 sites	80,829 MWh	

Case studies of Energy Savings in Eco-Factories & Offices

<https://www.hitachi.com/environment/casestudy/index.html#case02>

Reducing Transportation Energy Consumption

Activities

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.

About the Eco Rail Mark

<https://www.mlit.go.jp/tetudo/ecorailmark/ecorailmark-english.html>

Eco Rail Mark Initiatives

Company	Certification
Hitachi, Ltd.	Eco Rail Mark company* ¹ Eco Rail certified product* ²
Hitachi Channel Solutions	Eco Rail Mark company* ¹
Hitachi Industrial Equipment Systems	Eco Rail certified product* ²



*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 × 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 × 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 (with a checkmark icon), an increase of 5.4kt-CO₂, or 7%, compared to fiscal 2020.

3

Environmental

Environmental

Executive Summary

Advancing Our Environmental Vision and Long-Term Environmental Targets

Environmental Governance

➤ Achieving a Decarbonized Society

Efforts to Achieve a Decarbonized Society

Contributing to a Decarbonized Society Through the Decarbonization Business

Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

– Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

Achieving a Resource Efficient Society

Achieving a Harmonized Society with Nature

Environmental Data

Climate-related Financial Information Disclosure (Based on TCFD Recommendations) GRI 102-12

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

Structure

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.

P018 Framework for Promoting Sustainability Strategy

P036 Framework for Promoting Environmental Governance

Strategy

Approach GRI 102-11/102-15/102-29/201-2

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.

*1 A Representative Concentration Pathway (RCP) scenario under which, at the end of the 21st century, the increase in global temperatures from preindustrial levels is kept below 2°C.

*2 An RCP scenario that assumes that emissions will continue to rise resulting in an approximately 4°C rise in global temperatures compared to preindustrial levels.

P031 The Environmental Vision and Hitachi Environmental Innovation 2050

P041 Environmental Strategy for Achieving a Decarbonized Society

P045 CO₂ Emission Reductions at Business Sites (Factories and Offices) and Hitachi Carbon Neutrality 2030

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

	Time span	Reason for adoption
Short term	Over the next three years from fiscal 2022 to 2024	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
Medium term	Through fiscal 2030	Time span of our fiscal 2030 long-term environmental targets
Long term	Up to fiscal 2050	Time span of our fiscal 2050 long-term environmental targets

▶ Degrees of Impact

Impact	Definition
Major	Has an impact sufficient to disrupt business or cause it to substantially decrease or increase
Medium	Part of the business is impacted.
Minor	There is little impact.

3

Environmental

Environmental

Executive Summary

Advancing Our Environmental Vision and Long-Term Environmental Targets

Environmental Governance

➤ Achieving a Decarbonized Society

Efforts to Achieve a Decarbonized Society

Contributing to a Decarbonized Society Through the Decarbonization Business

Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

– Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

Achieving a Resource Efficient Society

Achieving a Harmonized Society with Nature

Environmental Data

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 using these criteria 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.

📌 The Business Environment, Major Risks and Opportunities, and Strategies under the 1.5°C and 4°C Scenarios

Note: This table is divided into the following three pages.

Target businesses	Railway systems	Power generation and power grids	IT systems	Industrial equipment	Automotive systems
The business environment and major risks and opportunities under the 1.5°C scenario	<p>Business environment Global demand for transport systems that emit less CO₂ per distance covered will grow with tighter CO₂ emission regulations in each country and region.</p>	<p>Business environment 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. Power networks will increasingly accommodate natural energy produced through distributed generation.</p>	<p>Business environment Demand for energy-saving, high-efficiency IT solutions will grow with tighter CO₂ emission regulations in each country and region. There will also be increased demand for data centers and data analysis systems to accommodate the expansion of financial services such as investments and loans for decarbonization businesses, green bond issues, and data utilization businesses.</p>	<p>Business environment Global demand for energy-saving industrial equipment will grow with tighter CO₂ emission regulations in each country and region.</p>	<p>Business environment Electric vehicles 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.</p>
	<p>Risks 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 MaaS.</p>	<p>Risks Delays in the construction of power networks that would enable the mass introduction of renewable energy with large output fluctuations.</p>	<p>Risks 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.</p>	<p>Risks Competitiveness will decline if there are delays in the development of high-efficiency, low-loss products.</p>	<p>Risks Delay transition to a new business environment caused by rapidly development of internal combustion engine vehicles will potentially decline sales.</p>
	<p>Opportunities Demand will grow for railways, which emit less CO₂ per distance covered. There will be a shift to energy-saving railcars from conventional models, and the efficiency of railway services will be improved through digital utilization. Data usage will also boost demand for new mobility services.</p>	<p>Opportunities 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 diversification of energy suppliers.</p>	<p>Opportunities Demand will grow for energy-saving and high-efficiency information systems that contribute to zero-emissions. There will also be increased demand for environment-related financial services as investments and loans for decarbonization businesses and green bond issues.</p>	<p>Opportunities Utilization of IoT, digitalization, and connected systems to develop innovative products and solutions that contribute to CO₂ emission reductions without relying on the energy-saving features of individual products.</p>	<p>Opportunities Expanding market for electric, hydrogen, and biofuel vehicles including motorcycles to replace internal combustion engine vehicles.</p>

3

Environmental

Environmental

Executive Summary

Advancing Our Environmental Vision and Long-Term Environmental Targets

Environmental Governance

➤ **Achieving a Decarbonized Society**

Efforts to Achieve a Decarbonized Society

Contributing to a Decarbonized Society Through the Decarbonization Business

Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

– Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

Achieving a Resource Efficient Society

Achieving a Harmonized Society with Nature

Environmental Data

Target businesses	Railway systems	Power generation and power grids	IT systems	Industrial equipment	Automotive systems
The business environment and major risks and opportunities under the 4°C scenario	<p>Business environment 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.</p>	<p>Business environment The cost competitiveness of non-fossil energy will increase, and demand for renewable, nuclear, and other non-fossil energy will increase as the expansion of energy consumption pushes up the price of fossil fuels. Natural disasters caused by climate change will rise sharply.</p>	<p>Business environment Demand for new, high-efficiency technology will expand as multiplex 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.</p>	<p>Business environment Typhoons, floods, and other natural disasters caused by climate change will rise sharply.</p>	<p>Business environment Fuel efficiency laws and regulations will remain lax 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.</p>
	<p>Risks The high frequency of natural disasters will exacerbate damage to production facilities, worsen working environments, and disrupt supply chains leading to delays in deliveries and the procurement of parts.</p>	<p>Risks 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.</p>	<p>Risks Natural disasters will exacerbate damage to production facilities, worsen working environments, and disrupt supply chains leading to delays in deliveries and the procurement of parts.</p>	<p>Risks Natural disasters will exacerbate damage to production facilities, worsen working environments, and disrupt supply chains leading to delays in deliveries and the procurement of parts.</p>	<p>Risks Natural disasters will exacerbate damage to production facilities, worsen working environments, and disrupt supply chains leading to delays in deliveries and the procurement of parts.</p>
	<p>Opportunities Transport systems more resilient to natural disasters can be developed. Competitiveness can be enhanced by providing added value in such forms as energy-saving railcars and adaptability to new technologies.</p>	<p>Opportunities Energy demand will grow as warmer weather leads to increased use of air conditioning. Demand will increase for disaster-resilient power generation and transmission/distribution technologies.</p>	<p>Opportunities Demand will increase for social and public systems that help reduce damage from natural disasters and for IT systems required as part of BCP.</p>	<p>Opportunities Efforts to accommodate IoT products will lead to higher demand for remote control and remote maintenance during natural disasters.</p>	<p>Opportunities Demand will grow for technologies to enhance the efficiency of internal combustion engines.</p>
Non-environmental market factors (neither the 1.5°C nor 4°C scenario)	<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● Economic growth, urbanization, and population growth will push up demand for energy, especially electricity, mainly 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. 	<ul style="list-style-type: none"> ● Further digitization 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. 	<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● Economic growth, urbanization, population growth, and infrastructure development like road construction will expand the global market for automobiles and motorcycles as a flexible and personal means of transport. ● The global pandemic may temporarily dampen passenger vehicle sales due to restrictions on people's movements, but commercial vehicle sales appear to be rising as the need for the delivery of goods increases. ● Businesses that offer greater safety, security, and comfort, such as those developing autonomous driving and advanced safety devices, will become increasingly important. ● Technological innovations in the connected industries will create new mobility service markets.

3

Environmental

Environmental

Executive Summary

Advancing Our Environmental Vision and Long-Term Environmental Targets

Environmental Governance

➤ **Achieving a Decarbonized Society**

Efforts to Achieve a Decarbonized Society

Contributing to a Decarbonized Society Through the Decarbonization Business

Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

– Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

Achieving a Resource Efficient Society

Achieving a Harmonized Society with Nature

Environmental Data

Target businesses	Railway systems	Power generation and power grids	IT systems	Industrial equipment	Automotive systems
Response to future business risks (business opportunities)	<p>Response to business risks under 1.5°C or 4°C scenarios</p> <ul style="list-style-type: none"> Continue to strengthen the railway business as global demand for railways will increase under either scenario. Specifically, develop and market more energy-saving railcars and battery-powered railcars for non-electrified sections. Strengthen railway services through digital utilization such as dynamic headway (flexible operations in response to passenger demand) and new mobility services like MaaS. Given the increasing frequency of natural disasters, take risk aversion into account when deciding the location and equipment layout of a new plant. Keep an eye on the supply chain in strengthening our ability to respond to business disruption risks in accordance with our BCPs. 	<p>Response to business risks under 1.5°C or 4°C scenarios</p> <ul style="list-style-type: none"> Continue to enhance the response to relevant markets in view of expected higher demand for non-fossil energy under either scenario. Strengthen the provision of grid solutions, digital service solutions, and energy platforms that can accommodate the increased use of renewable energy and diversification of energy supply and demand management. Given the increasing frequency of natural disasters, develop technologies for disaster-resilient renewable energy systems and disruption-resistant power transmission/distribution systems. Take risk aversion into account when deciding the location and equipment layout of a new production plant. Keep an eye on the supply chain in strengthening our ability to respond to business disruption risks in accordance with our BCPs. 	<p>Response to business risks under 1.5°C or 4°C scenarios</p> <ul style="list-style-type: none"> Continue to develop innovative digital technologies, nurture necessary human capital, and enhance digital service solutions that generate new value in view of the expected growth in demand for digital services and the subsequent market expansion under either scenario. Specifically, enhance competitiveness by providing energy-saving and high-efficiency IT solutions that contribute to the following: zero-emissions; environment-related financial services for decarbonization businesses; social and public systems to prevent natural disasters, reduce damage, and enhance resilience; and IT systems for BCPs. Given the increasing frequency of natural disasters, strengthen our ability to respond to business disruption risks in accordance with our BCPs. Ensure competitiveness by decarbonizing data centers actively. 	<p>Response to business risks under 1.5°C or 4°C scenarios</p> <ul style="list-style-type: none"> Under either scenario, continue developing energy-saving, high-efficiency products that use IoT technology. Focus particularly on connected products with communication features. Miniaturized, high-efficiency, low-loss products can also help reduce CO₂ emissions. Given the increasing frequency of natural disasters, take risk aversion into account when deciding the location and equipment layout of a new plant. Keep an eye on the supply chain in strengthening our ability to respond to business disruption risks in accordance with our BCPs. 	<p>Response to business risks under the 1.5°C scenario</p> <ul style="list-style-type: none"> Promote R&D of electrification technology and other alternative technologies to enhance the response to new markets such as electric vehicles.
	<p>Response to business risks under the 4°C scenario</p> <ul style="list-style-type: none"> Promote R&D and product development in existing technologies, including internal combustion engines, to not only improve energy efficiency but also non-environmental issues like safety, security, and comfort. Given the increasing frequency of natural disasters, take risk aversion into account when deciding the location and equipment layout of a new plant. Keep an eye on the supply chain in strengthening our ability to respond to business disruption risks in accordance with our BCPs. 				
Financial information (sales volume of each target sector)	Partial impact on the revenue of the railway systems business, which accounted for approximately 6.1% of Hitachi's revenue at 628.3 billion yen in fiscal 2021	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	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	Partial impact on the revenue of the Industry Sector, which accounted for approximately 4.0% of Hitachi's revenue at 409.4 billion yen in fiscal 2021	Partial impact on the revenue of the automotive business (Hitachi Astemo), which accounted for approximately 15.6% of Hitachi's revenue at 1,597.7 billion yen in fiscal 2021

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.

3

Environmental

Environmental

Executive Summary

Advancing Our Environmental Vision and Long-Term Environmental Targets

Environmental Governance

➤ **Achieving a Decarbonized Society**

Efforts to Achieve a Decarbonized Society

Contributing to a Decarbonized Society Through the Decarbonization Business

Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

– Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

Achieving a Resource Efficient Society

Achieving a Harmonized Society with Nature

Environmental Data

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.

(1) Risks related to the transition to a decarbonized economy (applying mostly to the 1.5°C scenario)				
Category	Major risks	Time span	Impact	Main initiatives
Policy and legal	Increased business costs from the introduction of carbon taxes, fuel/energy consumption taxes, emissions trading systems, and other measures	Short to long term	Medium	<ul style="list-style-type: none"> Shift from fossil fuel-using to non-fossil fuel-using businesses. Promote activities aimed at achieving carbon neutrality Avoid increases in business costs by further enhancing production and transport efficiency and promoting the use of non-fossil fuel-based energy Promote energy-saving equipment by introducing Hitachi Internal Carbon Pricing (HICP)
Technology	Loss of sales opportunities due to delays in technology development for products and services for a decarbonized society	Short to long term	Medium	<ul style="list-style-type: none"> Contribute to reducing CO₂ emissions by developing and marketing innovative products and services that lead to the achievement of long-term environmental targets and expanding the decarbonization business Promote the development of energy-saving and low-carbon products by implementing Environmentally Conscious Design Assessments when designing products and services
Market and reputation	Impact on sales due to changes in market values or assessment of our approach to climate issues	Medium to long term	Minor	<ul style="list-style-type: none"> Established a goal of carbon neutrality in the Hitachi Environmental Innovation 2050 long-term environmental targets; participated in COP26 and communicated to the world advanced technologies and initiatives that support the realization of a decarbonized society

(2) Risks related to the physical impacts of climate change (4°C scenario)				
Category	Major risks	Time span	Impact	Main initiatives
Acute and chronic physical risks	Climate-related risks to business continuity including increased severity of typhoons, floods, and droughts (acute risks), as well as rising sea levels and chronic heat waves (chronic risks)	Short to long term	Medium	<ul style="list-style-type: none"> Taking into account the possibility of flood damage when deciding on the location or equipment layout of a new plant. Measures tailored to the water risks of each manufacturing site will be strengthened in the future based on the results of a water risk assessment now being conducted

3

Environmental

Environmental

Executive Summary

Advancing Our Environmental Vision and Long-Term Environmental Targets

Environmental Governance

➤ **Achieving a Decarbonized Society**

Efforts to Achieve a Decarbonized Society

Contributing to a Decarbonized Society Through the Decarbonization Business

Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

– Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

Achieving a Resource Efficient Society

Achieving a Harmonized Society with Nature

Environmental Data

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.

Category	Major risks	Impact	Main initiatives
Acute and chronic physical risks	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	Medium	<ul style="list-style-type: none"> Expand business areas that contribute to decarbonization. Promote decarbonized solutions and services through collaborative initiatives with customers. 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.
Resilience	Provision of solutions to address climate-related natural disasters	Medium	<ul style="list-style-type: none"> Providing disaster prevention solutions such as high-performance firefighting command systems

P042 Expanding the Decarbonization Business

P057 Responding to Water Risks



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.

3

Environmental

Environmental

Executive Summary

Advancing Our Environmental Vision and Long-Term Environmental Targets

Environmental Governance

➤ Achieving a Decarbonized Society

Efforts to Achieve a Decarbonized Society

Contributing to a Decarbonized Society Through the Decarbonization Business

Contributing to a Decarbonized Society at Business Sites (Factories and Offices)

– Climate-related Financial Information Disclosure (Based on TCFD Recommendations)

Achieving a Resource Efficient Society

Achieving a Harmonized Society with Nature

Environmental Data

Risk Management

Structure

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

Target

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.

- 📄 P031 The Environmental Vision and Hitachi Environmental Innovation 2050
- 📄 P033 Environmental Action Plan
- 📄 P041 Achieving a Decarbonized Society
- 📄 P042 Expanding the Decarbonization Business
- 📄 P045 Contributing to a Decarbonized Society at Business Sites (Factories and Offices)
- 📄 P067 Calculating GHG Emissions Throughout the Value Chain (Fiscal 2021)
- 📄 P166 Reflecting Sustainability Targets in Executive Compensation Evaluation