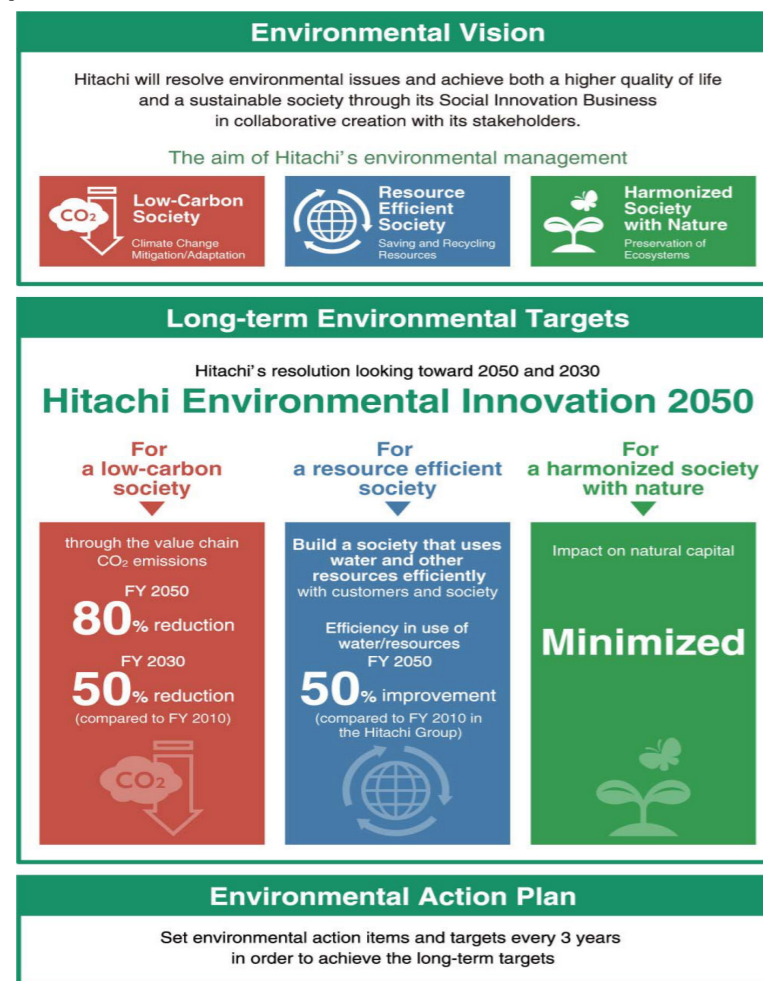


Initiative for Climate Change

1 Environmental Vision/Basic Environmental Policies

The Hitachi Metals Group promotes a low-carbon society, resource efficient society, and harmonized society with nature as the three key pillars of the Hitachi Group's Environmental Vision. We aim to realize both higher quality lifestyles and a sustainable society by resolving environmental issues through the social innovation business in collaboration with our stakeholders. In addition, we will fulfill our required role to achieve Hitachi's long-term environmental targets called Hitachi Environmental Innovation 2050.

The Hitachi Group's Environmental Vision



Hitachi Metals Group Basic Environmental Protection Policies

- Philosophy** Hitachi Metals' Corporate Creed is to "contribute to society by being the best enterprise." In line with this, we regard it as crucial to ensure that humanity's shared environmental resources can be passed down to future generations in the best possible condition. Accordingly, throughout our operations we treat environmental considerations as an issue of the highest importance and strive actively to promote environmental protection efforts on both the global and local community levels.
- Slogans**
- With a deep awareness that environmental protection is a major issue for all humanity, fulfill social responsibilities by striving to establish a sustainable society in harmony with the environment regarding it as one of the essential aspects of corporate activity.
 - Contribute to society by developing highly reliable technologies and products in response to needs for environmental protection and the limited natural resources.

2 Hitachi Metals Group Action Plan

The Hitachi Metals Group advances activities based on three-year medium-term environmental plans. We largely achieved the targets of our Medium-Term Environmental Plan for fiscal 2016 to fiscal 2018. Our new Medium-Term Environmental

Plan for fiscal 2019 to fiscal 2021 includes some revisions relating to a low-carbon society, resource-efficient society, and harmonized society with nature.

Results of Fiscal 2018 Initiatives and Fiscal 2021 Plans

FY2018 Measures (Planned)	FY2018 Measures (Results)	Measures Planned for FY2021
• Conduct environmental education at the Head Office and each company (ongoing)	• Conduct environmental e-learning (100% of employees) and environmental auditor development training (once)	• Conduct environmental e-learning (100% of employees) and environmental auditor development training (once)
• Increase the sales ratio of key environmentally conscious products (21% or more)	• Increase the sales ratio of key environmentally conscious products (21%)	• Increase the sales ratio of key environmentally conscious products (25%)
• Reduce energy consumption ratio per production unit (13.0% compared to base year FY2005)	• Reduce energy consumption ratio per production unit (6.6% compared to base year FY2005)	• Reduce CO ₂ emissions per unit (7% compared to base year FY2010)
• Improvement ratio of waste and valuables generated per production unit (8.0% compared to base year FY2005)	• Improvement ratio of waste and valuables generated per production unit (12.0% compared to base year FY2005)	• Improvement ratio of waste generation per production unit (14% compared to base year FY2010)
• Increase the recycling rate (74.0%)	• Increase the recycling rate (78.2%)	• Improve waste landfill rate (12%)
• Improvement ratio of water usage per production unit (14% compared to base year FY2006)	• Improvement ratio of water usage per production unit (28% compared to base year FY2006)	• Improvement ratio of water usage per production unit (26% compared to base year FY2010)
• Implement activities to conserve ecosystems (1,600/year)	• Implement activities to conserve ecosystems (1,601/year)	• Contribute to preservation of ecosystem (cumulative total of 12 projects to be implemented)

3 Environmental Consideration in Products and Services

The "Business Conduct Guidelines" in the Hitachi Metals Group Basic Environmental Policies call for the promotion of global *monozukuri* that takes environmental impact into account throughout the product life cycle. In line with this, the Hitachi Metals Group carries out activities aimed at reducing environmental impact at each stage, including product R&D and design, production, distribution, sale, use, and disposal.

In particular, for our next-generation flagship products, we are pushing forward the development of new products with a focus on the environment and energy sectors. What is more, for the development and design of new products, we promote environmentally friendly product development based on the "Hitachi Group Eco-Design Management Guidelines" (revised version), which consider product life cycles.

R&D Case Studies

Sector	Environmental key words
Energy	Renewable energy
	Highly efficient power generation
	Energy-saving/electricity storing/electricity transforming/smart grids
Automobiles	Material recycling
	Exhaust gas
	Reduced weight and low fuel consumption
Rolling stock	Hybrid and electric vehicles
	Material recycling
Electronics	More efficient and lighter weight
	More efficient, compact, and lighter weight
	Energy-saving (household appliances, semiconductors, LCD panels)
Industry/Infrastructure	Reducing substances for environmental effect
	Long-life products
Medical	High heat resistance and high corrosion resistance
	Energy-saving and high precision

Increasing sales of key environmentally conscious products

We select "key environmentally conscious products" from among products expected to grow in sales, which make a significant contribution to resolving environmental issues such as climate change and effective use of resources.

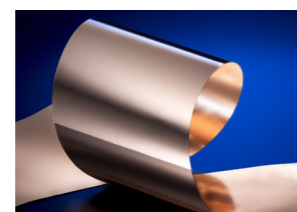
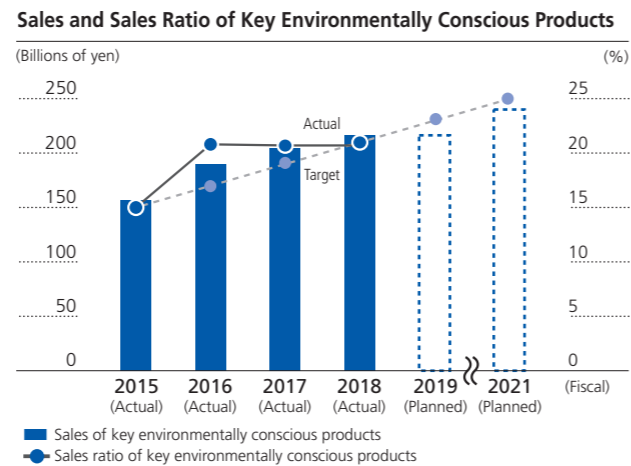
In fiscal 2018, we achieved our target sales ratio of 21% for key environmentally conscious products. While sales of some key environmentally conscious products have grown, sales of others have decreased, due to factors including discontinuation of the business. Accordingly, the sales ratio increased slightly compared with the previous fiscal year. We will continue to help resolve the environmental issues facing society by expanding sales of key environmentally conscious products based on our management strategy.

Introducing products contributing to reduced environmental loads



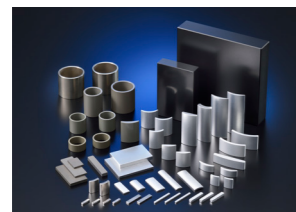
DAC-i™

Next-generation general-purpose steel for die-cast molds with high toughness and high strength at elevated temperatures through innovations in component design and processes using 10,000-ton forging press.



Clad materials for batteries

Achieved optimal composite characteristics for a battery electrode material, including electric resistance, weldability, and material strength, by combining dissimilar metals such as copper, nickel, aluminum, and stainless steel.



Rare earth magnets for xEVs

They are used in the drive motors of electric vehicles and hybrid electric vehicles. We have established a technology to reduce the use of heavy rare earth elements (scarce rare metals), which are used to improve heat resistance. We reduce the use of elements with a limited supply, as well as help improve motor performance and make motors more compact by improving heat resistance and magnetic force.



Magnet wires for xEV inverter-fed motors

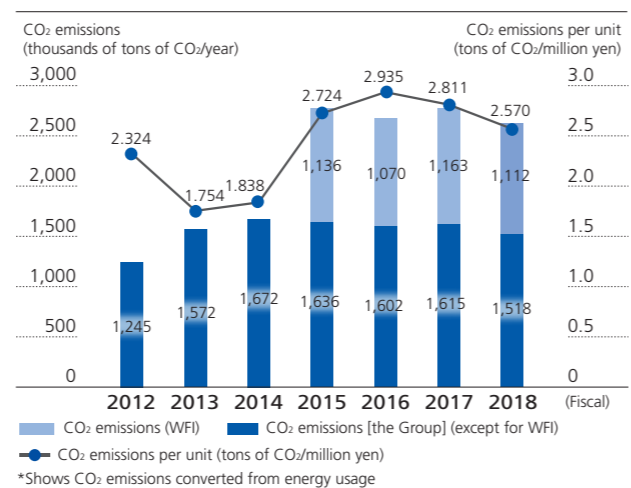
Lifetime of inverter-fed motors, greatly improve reliability.

4 Initiatives for a Low Carbon Society

In fiscal 2018, CO₂ emissions from the Hitachi Metals Group's business activities decreased by 148 thousand tons (5.3%) from the previous fiscal year, to 2,630 thousand tons. In terms of CO₂ emissions per sales unit compared to revenues, we improved by approximately 8.6% from the previous fiscal year, from 2.811 tons of CO₂/million yen to 2.570 tons of CO₂/million yen, due in part to a year-on-year increase of 3.6% in sales. Factors behind the reduction of CO₂ emissions and improvement in per unit include the effects of energy-saving activities, increased sales, and fuel conversion.

The Hitachi Metals Group carries out energy-saving activities linked to *monozukuri* in order to reduce CO₂ emissions, including shortening processes, improving efficiency, improving yields, promoting the introduction of energy-saving equipment, and fuel conversion. We will promote the initiatives aiming to improve CO₂ emissions per unit as set forth in our Medium-Term Environmental Action Plan for fiscal 2019 to fiscal 2021.

Trends in CO₂ Emissions and CO₂ Emissions Per Unit



Energy Saving Initiatives by Waupaca Foundry, Inc.

Waupaca Foundry, Inc. ("Waupaca," located in Wisconsin, USA) spends about ¥19.8 billion per year on energy, and it is essential to reduce its energy usage through efforts to continually improve its environmental sustainability. Waupaca thus worked on initiatives including conversion to energy-efficient LED lighting and compressors in its factories, offices, and other work spaces, use of waste heat for indoor heating in winter, installation of a system enabling real-time monitoring of energy use, and reduction of coke usage through the use of alternative carbon materials. Through these measures, Waupaca reduced its costs by about ¥63 million in fiscal 2017.

Waupaca is currently advancing measures including a 25% reduction in energy usage (baseline fiscal 2009, compared to BAU*¹) and introducing the best available pollution-prevention technologies, in order to reduce its environmental impact by 2020.

*1. Comparison against "business as usual" case where no measures are taken



Energy Management System Certification (Energy management under ISO 14001)

5 Effective Use of Resources toward a Resource-Efficient Society

(1) Effective Use of Resources (Waste)

The Hitachi Metals Group is working to create a resource-efficient society through in-house reuse and recycling through intermediate processing, in order to achieve the "thorough circulation of resources throughout the life cycle of goods and services" in the 4th Fundamental Plan for Establishing a Sound Material-Cycle Society.

In fiscal 2018, the resource recycling rate rose slightly from the previous fiscal year, to 78.2%, in part because more materials are difficult to recycle into resources in Japan.

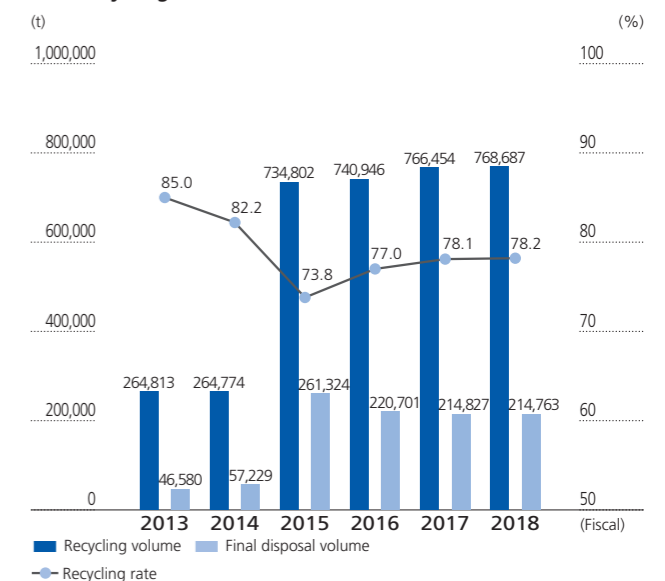
Going forward, we plan to raise the bar overall through initiatives at overseas offices, where we believe that many recyclable items remain.

Furthermore, in fiscal 2018 we achieved zero emissions*² at 14 business offices.

In order to advance initiatives to both reduce waste generation and to recycle resources under our Medium-Term Environmental Plan for fiscal 2019 to fiscal 2021, we will promote activities by setting target values for waste generation per production unit and landfill rates as management indicators.

*2. As of fiscal 2011, the definition of "zero emissions" is a final disposal rate under 0.5%.

Trends in Recycling Volume, Final Disposal Volume, and Recycling Rate



Initiatives to Recycle Amorphous Metal Materials

The amorphous metal manufactured by the Company contributes significantly to energy saving, delivering excellent soft magnetic properties with high permeability and low loss, while having high saturation magnetic flux density, and having just about one-fifth the no-load loss (iron loss) of conventional soft magnetic materials like silicon steel sheets.

Our Metglas Yasugi Works is working to use resources efficiently by recovering and recycling the amorphous metal

scraps generated by the Hitachi Group's transformer manufacturing process and amorphous cores extracted from used transformers.

As a result of this initiative, approximately 120 tons of waste amorphous was used to manufacture amorphous metal materials in fiscal 2018.



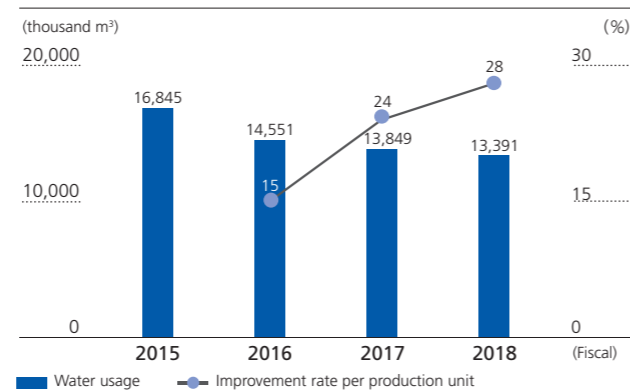
(2) Effective Use of Water Resources

Since fiscal 2016, the Hitachi Metals Group has been advancing activities using the improvement rate of water usage per production unit*³ as an indicator, in order to promote the effective use of water resources. Although activities to raise awareness of water conservation were the initial focus, we subsequently ameliorated our water usage in production processes, and when we upgrade equipment, we introduce equipment with high water efficiency. In fiscal 2018, the improvement rate per production unit reached 28%, while we also reduced our water usage by 458 thousand m³ from the previous fiscal year, to 13,391 thousand m³. Our Medium-Term Environmental Plan for fiscal 2021 similarly establishes the improvement rate of water usage per production unit*⁴ as an indicator, and we will push forward even more effective use of water.

*³ Calculated based on per production unit in fiscal 2005

*⁴ Calculated based on per production unit in fiscal 2010

Trends in Improvement Rate of Water Usage per Production Unit



* We have used the improvement rate of water usage per production unit as a management indicator since fiscal 2016.

Reducing Water Usage through Introduction of Closed-Loop Cooling Water Systems (Waupaca)

Waupaca Plant 1 produces a wide range of castings, totaling more than 3,000 different kinds of products including automotive parts.

Foundries use large amounts of water to cool operating machinery and cupolas used in melting processes. Waupaca Plant 1 introduced closed-loop cooling water systems, which resulted in a reduction in water usage in fiscal 2018 by approximately 120 million gallons compared to fiscal 2015. While the company formerly used cooling water one time before discharging it as wastewater, the closed-loop cooling water systems repeatedly use non-contact cooling water, greatly improving water usage efficiency. Dramatic effects are expected from the closed-loop cooling water systems, which might be able to reduce water withdrawal by 80% or more, and under certain conditions can reduce wastewater from non-contact cooling water to nearly zero.

Waupaca is advancing activities aimed at reducing companywide water withdrawal by 80% from fiscal 2010 levels. In fiscal 2018, it reduced water withdrawal by 65.5% from fiscal 2010 levels.



Closed-loop cooling water systems

7 Harmonized Society with Nature: Consideration for the Preservation of Ecosystem

The Hitachi Metals Group promotes ecosystem preservation measures that include tree planting and forest conservation activities, cleanup activities in areas surrounding factories, and environmental education.

In fiscal 2018, we carried out 1,601 projects, compared to our target of 1,600.

(A) Examples of major tree planting and forest conservation activities

HMY, Ltd. participated in the Harmony Forest corporate participation forestation program in Shimane Prefecture, planting sawtooth oak trees to reduce CO₂.

(B) Ecosystem preservation activities

Our Moka Works participated in a group cleanup activity at Shiroyama Park to protect ecosystems by removing trash. We will continue to work to protect ecosystems in our local communities.



Participation in Harmony Forest activities
Activities to reduce CO₂ in the corporate participation forestation program in Shimane Prefecture (HMY, Ltd.)



Participation in Shiroyama Park group cleanup activity
(Moka Works of Hitachi Metals, Ltd.)