

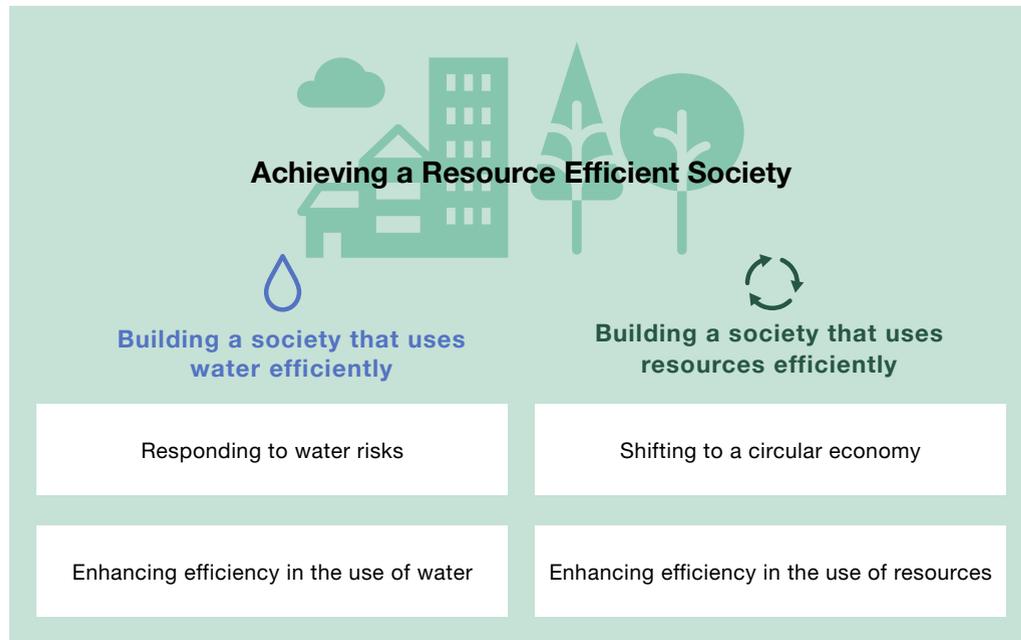
Achieving a Resource Efficient Society

Efforts to Achieve a Resource Efficient Society

Approach

The issues of water and resource scarcity, triggered by rising water demand and population growth—resulting in higher volumes of resources collected, extracted, used, and eventually emitted as waste—are common concerns for the entire world. Hitachi’s business operations will respond to these issues by working with our customers and society to help build a society that uses water and other resources efficiently. We have set a fiscal 2050 target of improving the usage efficiency of water and other resources by 50% compared to fiscal 2010 levels. We will create higher economic value using less water and other resources and pursue production activities with a low environmental burden.

■ Initiatives to Achieve a Resource Efficient Society



Building a Water Efficient Society

Hitachi's Approach to Water Risks

Approach

303-2 | 303-5

Embracing the importance of developing region-specific risk measures that take the respective water stress*1 levels into account, Hitachi strives to better understand the water issues faced by some 200 business sites around the world, which are classified as category A in our environmental management classification. To this end, we identify water risks at each site by using our Environmental Data Collection System (Eco-DS) and such globally recognized tools for water risk assessment as the Aqeduct, developed by the World Resources Institute (WRI); the Water Risk Filter, developed by the World Wide Fund for Nature (WWF) and the German development finance institution DEG; and the Flood Hazard Map of the World produced by the European Union. To identify water risks, we analyze and evaluate water risks for each business unit and Group company, per country and region, and for the entire Group using approximately 50 assessment items, including physical risks like water stress that may affect water resources and quality or cause water damage; regulatory risks leading to higher water and discharge costs or new taxes; and reputation risks that can negatively affect communication with stakeholders, thereby implementing measures based on the nature and characteristics of each region and business.

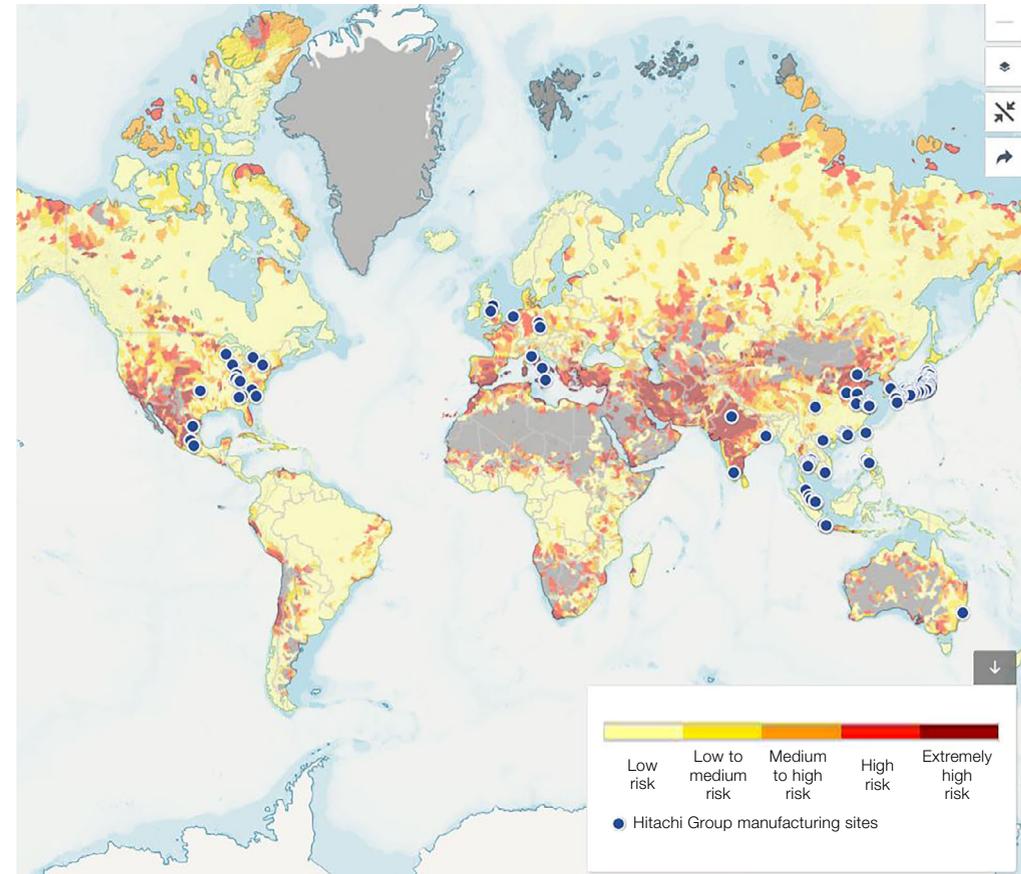
Achievements in FY 2019

In December 2019, we released the Water Risk Guidelines, which stipulate policies on how to identify and respond to water risks at each region and business area, taking into consideration the impacts of water risks on our business. The guidelines were developed with reference to *Setting Site Water Targets Informed by Catchment Context*,*2 published in August 2019, and are shared among the Hitachi Group together with the checklist to identify water risks and case studies of measures taken at our business sites.

*1 Water stress occurs when demand for water outpaces availability. The maximum volume of available water supply per capita is used as an index to measure levels of scarcity. The minimum volume of water required for living, agriculture, industry, energy, and the environment is considered to be 1,700 cubic meters per person per year, and regions below this level are said to experience water stress. According to the WRI Aqeduct risk analysis, when the ratio of total annual water withdrawn to average annual water supply within an area is 80% or more, it is defined as extremely high risk.

*2 A guide created by members of UN Global Compact, CEO Water Mandate, Pacific Institute, WRI, WWF, and other global institutions with the aim of helping companies set effective site water targets.

Water Stress Levels at Manufacturing Sites



Created based on Aqeduct data.

WRI/Aqeduct
<https://www.wri.org/aqeduct/about>

Enhancing Our Environmental Management System

Actions and Achievements

Activities

In fiscal 2019, we set a target of a 23% reduction (over the base year of fiscal 2010) for water usage per unit and achieved a 26% reduction. The volume of water used declined by 20.9 million cubic meters, or 40% from the base year. Our measures to reduce water usage include more stringent management of water intake using flowmeters, leakage control by installing above-ground water pipes, circular use of cooling water, and reuse of purified waste water.

Improving Water Use Efficiency

Case Study

Project	Department, Group company	Activity
Reducing groundwater use by recycling cupola furnace cooling water	Hitachi Metals	About 40% reduction in groundwater use by installing new water tanks and cooling towers to cool the furnaces
Reducing water use by visualizing groundwater flow	Hitachi Global Life Solutions	Water conservation efforts including the introduction of a power-monitoring system that automatically measures the flow of groundwater

<https://www.hitachi.com/environment/casestudy/2019/case06.html>

<https://www.hitachi.com/environment/casestudy/2019/case07.html>

Products and Services that Contribute to Resolving Water Issues

Activities

Hitachi will provide customers with a wide range of water-related products and services, thereby contributing to resolving water issues through its global business operations.

Achievements in FY 2019

The Republic of South Africa (South Africa) suffers from a serious water shortage. Hitachi is engaged in a demonstration project of RemixWater,*1 an integrated seawater desalination and water reuse system in the city of Durban in cooperation with the New Energy and Industrial Technology Development Organization (NEDO). In fiscal 2019, we started operating the system at the demonstration site of a wastewater treatment plant in the city. In this demonstration project, we construct desalination facilities aiming to produce 6,250 tons*2 of product water meeting potability standards from seawater and treated and discharged wastewater every day, while saving 30% more energy*3 compared to conventional seawater desalination systems*4 and reducing the impact on the nearby marine environment. We plan to introduce this technology in South Africa and to other regions with serious water shortages, thus contributing to the development of water infrastructure and industry.

*1 RemixWater is a registered trademark of Hitachi in Japan.
 *2 This corresponds to a water supply population of about 25,000.
 *3 Hitachi estimates for RemixWater in case of converting 100,000 m³/day at 3.5% seawater salinity.
 *4 Conventional systems desalinate by filtrating seawater through a reverse osmosis (RO) membrane. High pressure is needed to permeate the RO membrane, leading to high energy consumption.

Environmental Action Plan for 2021 Management Values >>>

Reduction in Water Usage*1 per Unit (Hitachi Group)

FY 2010 (base year)

$$\frac{\text{Amount used } 52.75 \text{ million m}^3}{\text{Activity amount}^*2} = 100\%$$

From base year
26% reduction
 FY 2019 reduction target: 23%

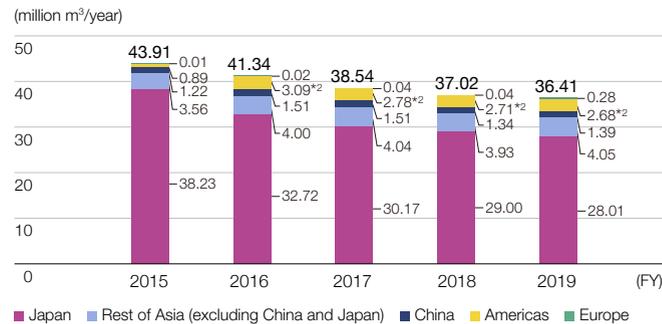
FY 2019

$$\frac{\text{Amount used } 31.90 \text{ million m}^3}{\text{Activity amount}} = 74\%$$

*1 Amount of water used in the production process.

*2 Activity amount is a value closely related to water use at each business site (for example, output, sales, and production weight).

Water Usage*1 (Hitachi Group)



*1 The total amount of water used in manufacturing processes and for other purposes, such as in offices.

*2 Includes water used by a materials company that became a reporting company in fiscal 2016 (2.12 million m³/year in fiscal 2016, 1.91 million m³/year in fiscal 2017, 1.92 million m³/year in fiscal 2018, and 1.63 million m³/year in fiscal 2019).

Hitachi's Water-related Products and Services

Activity field	Products or services (implementation to date)
Creating water resources	Wastewater recycling systems
	Seawater desalination systems
Developing water infrastructure	Water and sewage treatment, etc. (over 200 sites in about 40 countries and regions)
	Water purification plants (approximately 700 plants in Japan)
	Sewage treatment plants (approximately 900 plants in Japan)
	Comprehensive digital solutions for water and sewage treatment operators

Building a Society That Uses Resources Efficiently

Hitachi's Approach to Transition to a Circular Economy

Approach

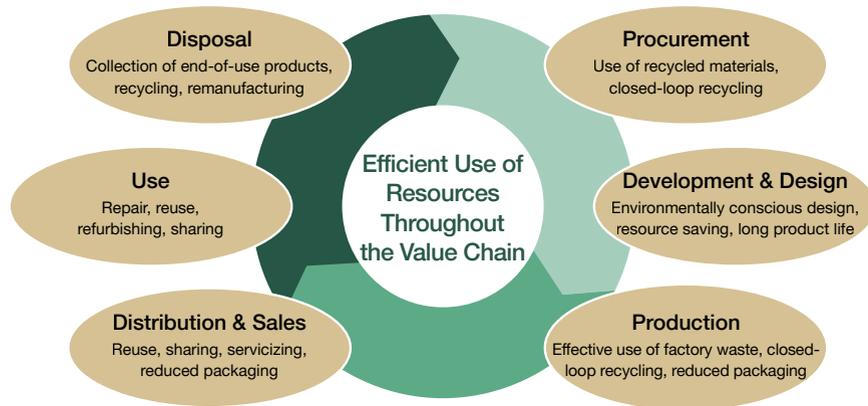
To help build a recycling-oriented society, Hitachi will advance a shift from the conventional linear economy to a circular economy. We will develop closed-loop recycling and servicizing*1 business models through utilization of recycled materials, manufacturing that is oriented to resource saving and long product life, reduction and recycling of factory waste, refurbishing*2 and remanufacturing,*3 and recycling of end-of-life products. These are advanced at each stage of the value chain, namely, procurement, development and design, production, distribution and sales, use, and disposal.

*1 Servicizing: Providing customers with the function of a product rather than selling them the product itself.

*2 Refurbishing: Servicing end-of-use products to a condition conforming to new-product standards.

*3 Remanufacturing: Restoring end-of-use products through disassembly, washing, component replacement, and other work to a condition equivalent to new products.

Efficient Use of Resources Throughout the Value Chain



Activities Related to Use and Disposal of Products

Activities

301-1 | 301-2 | 301-3

In Japan, Hitachi has built its own product recycling network providing services near our customers to collect and recycle such end-of-life products as supercomputers, mainframes, and other computing machines; communication equipment like network devices and telephone switchboards; and information equipment like ATMs, though collecting and recycling of these products are voluntary and not legally required of manufacturers.

Achievements in FY 2019

We collected a total of 15 tons of end-of-life personal computers and monitors, including all-in-one computers, of which 12 tons were recycled, achieving a resource recycling rate of 80%. The total weight of recyclable materials*1 recovered from four types of end-of-life home appliances collected was approximately 86 kt, of which some 77 kt were recycled. By product type, the recycling rate for refrigerators and freezers was 80%, exceeding by 10% point the legal requirement of 70% and that for washing machines and dryers was 93%, exceeding by 11% point the legal requirement of 82%.

*1 Recyclable materials: Parts and materials recovered from the four types of end-of-life home appliances (air conditioners, TVs, refrigerators and freezers, and washing machines and dryers) and recycled by putting them to use in house or by selling them or transferring them free of charge to others who will use them. The data is aggregated from Hitachi Global Life Solutions and Hitachi-Johnson Controls Air Conditioning.

By-Product Recycling Activities

- Large-capacity storage unit**
 Clean, check, and refurbish parts of the used device replaced by a new one for use as our warranty-backed maintenance parts (US)
- Construction machinery**
 Remanufacture used units at recycling plants as high-function, reasonably priced units which have functions equivalent to those of new ones (Japan, China, Australia, and six other countries)
- Electric components for automobiles**
 After collecting malfunctioning components from dealers and repair shops, disassemble, check, clean and restore, reassemble, and inspect those components and market them as products featuring the same performance as new ones (Japan)
- Industrial equipment (pumps, motors, distribution boards, transformers, refrigeration equipment, and air conditioners)**
 Collect and reuse end-of-life products as resources (Japan)
- Home appliances**
 Recycle the four types of end-of-use home appliances (air conditioners, TVs, refrigerators and freezers, and washing machines and dryers) at our 19 recycling plants as part of cooperative efforts among five companies*1 in response to the 2001 Home Appliance Recycling Law (Japan)

*1 Hitachi Global Life Solutions; Sharp Corp.; Sony Corp.; Fujitsu General Ltd.; and Mitsubishi Electric Corp.

Plastic Recycling Activities

Activities

Hitachi Global Life Solutions, the major consumer of plastic in the Hitachi Group, uses plastic in parts for washing machines and refrigerators and packing materials for ceiling lights. The company procures recycled plastic materials produced within the Hitachi Group using plastic parts recovered from end-of-life home appliances and plastic containers as well as purchasing recycled plastics from materials manufacturers.

Achievements in FY 2019

During fiscal 2019, a total of 1,163 tons of recycled plastic materials from end-of-life home appliances were used as parts for home appliances and packing materials.

Actions and Achievements

Activities

306-2

For fiscal 2019, we set a target of a 10% reduction (from a base year of fiscal 2010) for waste and valuables*¹ generated per unit, bettering this by achieving a 14% reduction. The amount of waste and valuables generated was reduced by 208 kt or 14% compared to the base year. We strived to reduce waste by installing recycling facilities within our business sites as well as through closed-loop recycling, whereby the by-products and scrap from the production process are reused as resources by other business sites, and repeated use of packing and cushioning materials during transport. Under the Zero Emission*² initiative, which seeks to minimize landfill disposal, 67 business sites out of 167 target business sites achieved their zero waste emissions goal*³ in fiscal 2019.

*1 Waste and valuables: Materials generated through business activities. Each country has a legal definition of waste, and in Japan, the term refers to refuse, bulky refuse, ashes, sludge, excreta, waste oil, waste acid and alkali, carcasses, and other filthy and unnecessary matter, which are in solid or liquid state according to the Waste Management and Public Cleansing Law. Valuables, meanwhile, are those materials left over after business activities other than waste, and can be sold or transferred free of charge to other parties as items of value.

*2 Zero emissions: The principles and methods advanced by United Nations University in 1994 aimed at eliminating waste from human activity as much as possible while maximizing the use of resources and achieving sustainable economic and manufacturing activities.

*3 Zero waste emissions goal: Defined as a final disposal rate (landfill disposal/waste and valuables) of less than 0.5% in any given fiscal year.

Environmental Action Plan for 2021 Management Values >>>

Reduction in Waste and Valuables Generation*¹ per Unit (Hitachi Group)

FY 2010 (base year)

$$\frac{\text{Amount generated } 1,434 \text{ kt}}{\text{Activity amount}^{*2}} = 100\%$$

From base year
14% reduction
FY 2019 reduction target: 10%

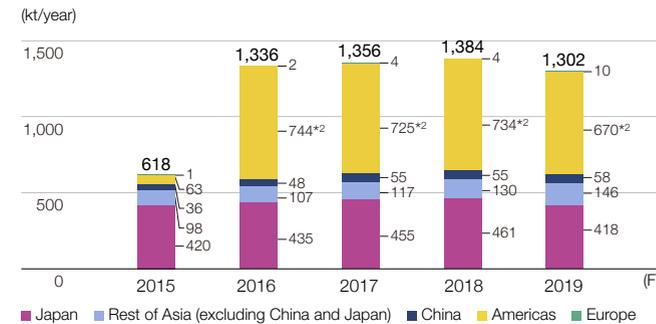
FY 2019

$$\frac{\text{Amount generated } 1,226 \text{ kt}}{\text{Activity amount}} = 86\%$$

*1 Amount of waste and valuables generated from the production process.

*2 Activity amount is a value closely related to waste and valuables generation at each business site (for example, output, sales, and production weight).

Waste and Valuables Generation*¹ (Hitachi Group)



*1 The total amount of waste and valuables generated in manufacturing processes plus that generated in offices and other nonmanufacturing business.

*2 Includes 675 kt (fiscal 2016), 675 kt (fiscal 2017), 689 kt (fiscal 2018), and 601 kt (fiscal 2019) of a materials company that became a reporting company in fiscal 2016.

Efficient Use of Resources

Case Study

Project	Department, Group company	Activity
Recycling of waste sand	Hitachi Metals	Reduction in the amount of waste sand generated in the process of manufacturing casting products by about 4,000 tons through recycling
Recycling polishing sludge with an abrasive powder compression system	Hitachi Automotive Systems	Recycling about 360 tons of polishing sludge that had been disposed of as industrial waste annually by introducing an abrasive powder compression system

▶  <https://www.hitachi.com/environment/casestudy/2019/case08.html>

▶  <https://www.hitachi.com/environment/casestudy/2019/case09.html>