

# Recycling Resources

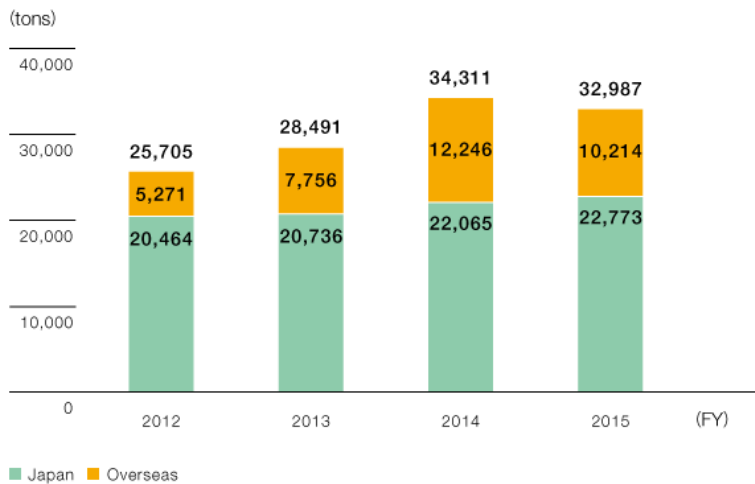
Fuji Electric is promoting the 3Rs (reduce, reuse, recycle) for in its products at the design, manufacturing, and disposal phases. At the same time, we are contributing to the creation of a recycling-oriented society by striving for zero emissions at our operational sites.

- [Reducing Waste](#)
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- [Environmental Impact Reduction Across Entire Product Lifecycles](#)

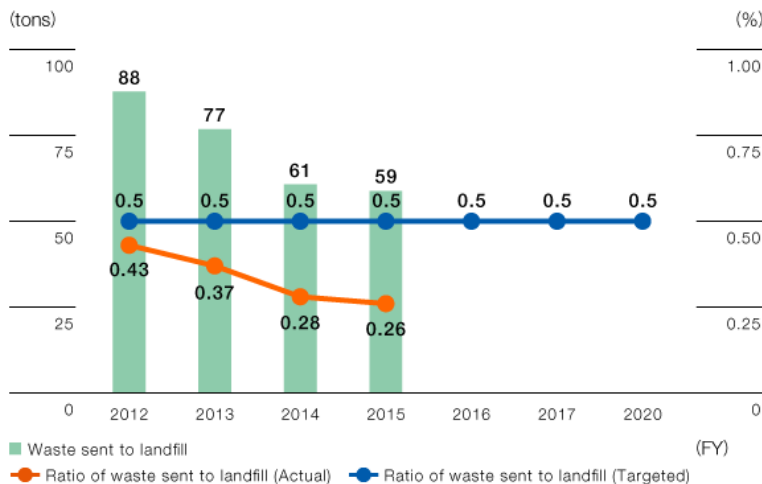
## Reducing Waste

Fuji Electric strives to reduce total waste volumes, promote recycling, and decrease the amount of waste sent to landfills. To this end, we are creating more-compact and -lightweight products, employing designs that do not include regulated substances, and working to decrease the number of defective products at the manufacturing stage through quality management initiatives. In reducing waste volume, we are pursuing a resource cycle that targets zero emission, defined as a final waste ratio (amount sent to landfills as a percentage of total waste generated) of 1% or less. In Japan, we have achieved zero emission continuously since fiscal 2004 through the efficient use of resources (reduce, reuse, recycle). Our final waste ratio for fiscal 2015 was 0.26%, while our target is for less than 0.5%. Moreover, we are working reduce and recycle waste overseas. In fiscal 2015, we were able to cut total waste production 2,000 tons. However, we also instituted a change to the treatment process for wastewater at a factory in Malaysia aimed at decreasing the environmentally hazardous materials contained in this wastewater (reducing the release of metallic components). Due to this change, we are no longer able to recycle the sludge created during wastewater treatment processes. Accordingly, the amount of waste sent to landfills increased approximately 700 tons, resulting in a ratio of waste sent to landfills of 17.29%.

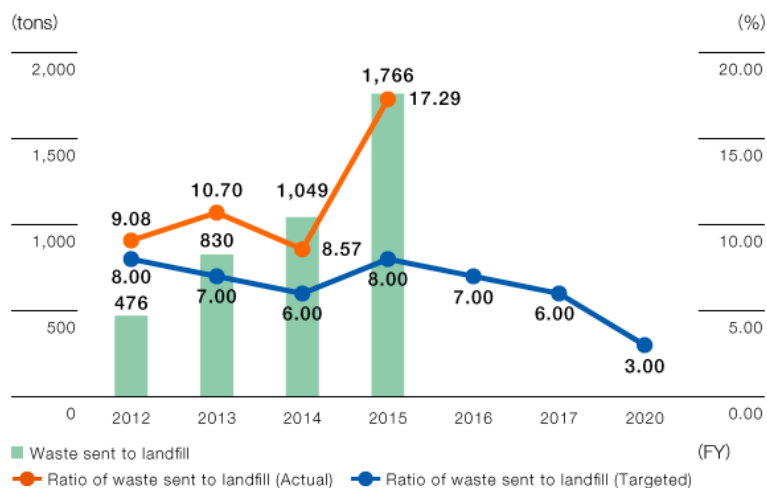
### Amount of Industrial Waste



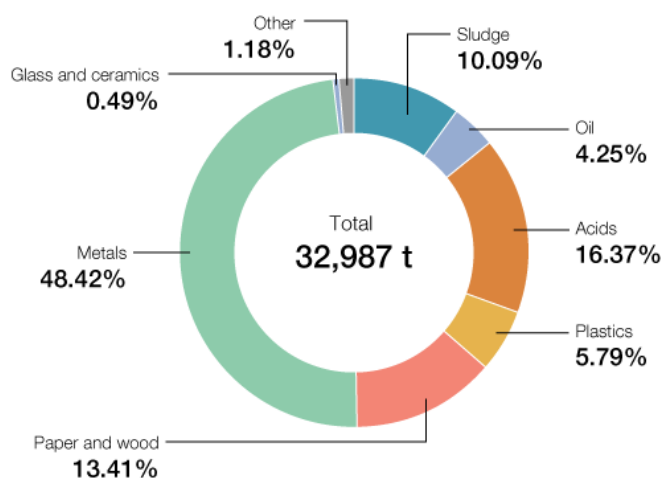
### Amount and Ratio of Waste Sent to Landfill in Japan



### Amount and Ratio of Waste Sent to Landfill Overseas



### Composition of Waste Generated



### Efficient Use of Water Resources

In view of the problem of global water resource depletion, in addition to its efforts to comply with wastewater standards and reduce wastewater, Fuji Electric is active in an initiative aimed at more efficient use of water resources. Using fiscal 2010 levels as a standard, this initiative aims to reduce both total water intake and production base units of consumption at our domestic manufacturing sites by 1% each, with the goal of reducing those levels by 10% in fiscal 2020.

At overseas manufacturing sites, in fiscal 2013 we set a target of a 25% reduction in water consumption per unit of production by fiscal 2020 relative to fiscal 2011, and we are working toward this goal. From fiscal 2016 we are adding another target of a 25% reduction in water intake by fiscal 2020.

Fuji Electric carries out assessments\* to confirm whether there is any risk of water shortages at manufacturing sites in Japan or overseas. These assessments have indicated that the Shenzhen Factory in China is the only site with a high risk of water shortage.

\* A comprehensive judgment of a base's water stress based on three indices

1. Results of global water stress assessments by region through the World Resources Institute Aqueduct Water Risk Atlas
2. Volume of water consumption
3. Water supply infrastructure


#### Example of an initiative for effective water use at a production base

China's Shenzhen Factory, which produces photoconductive drums, is in an area with high risk in a water stress assessment where supply restrictions are applied on the water indispensable for production in a dry season. Consequently, we have installed wastewater treatment and recycling facility in the Shenzhen Factory that enables it to control the volume of industrial-use water and wastewater. As a result, instead of the targeted 70% water recycling rate we agreed with the City of Shenzhen, we were able to raise that to an actual 80%, enabling a production framework with water stability.

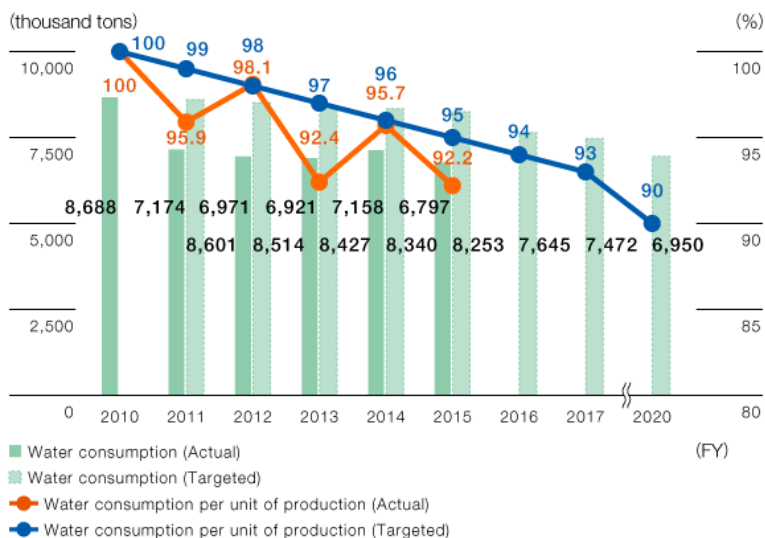
In addition, our Malaysian production base uses significant volumes of water even though its water risk is not high. Consequently, we set a target of reducing its water consumption by 2020 to 70% of the 2011 level, kicking off initiatives such as improving the management standards of production equipment using water and installing pure water recycling devices. As a result, water consumption in fiscal 2015 was reduced by 60,000 tons from the previous year.

At overseas manufacturing sites, in fiscal 2013 we set a target of a 25% reduction in water consumption per unit of production by fiscal 2020 relative to fiscal 2011. Because this target is set based on manufacturing output converted to yen, exchange rate

movements have meant that in recent years the target has been surpassed by a wide margin. We have therefore added another target of a 25% reduction in water consumption by fiscal 2020, and we are working toward that goal.

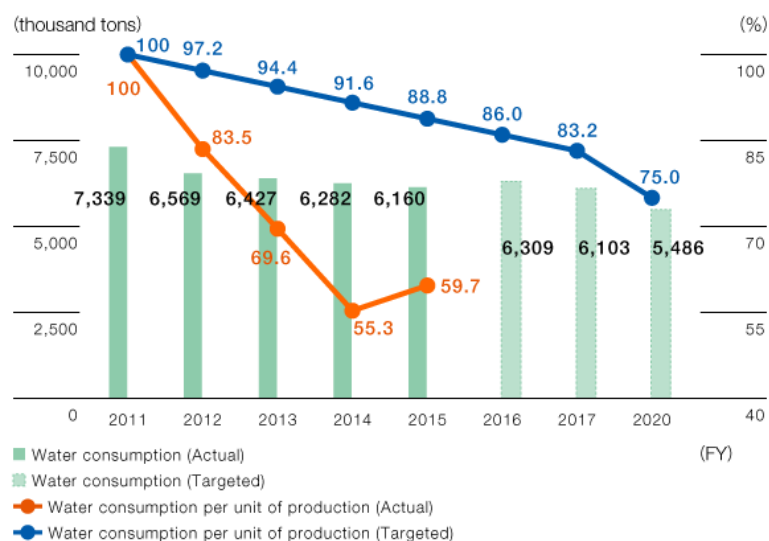
<b>Initiatives at Matsumoto Factory</b>	
<p>The Matsumoto Factory uses large quantities of pure water during the process of manufacturing semiconductor wafers and also utilizes a significant amount of water for cooling production equipment. For this reason, effectively utilizing water resources and reducing overall usage volumes is an important theme for initiatives at this factory.</p>	
<p><b>Pure water recycling initiatives:</b>                      We categorize wastewater from manufacturing processes, and water still of relatively high quality is recycled for use in creating pure water. The ratio of water recycled in this manner was 56.1% in fiscal 2015.</p> <p><b>Introduction of electric pure water manufacturing devices:</b>                      Manufacturing pure water utilizing ion exchange resins requires that these resins be periodically regenerated, and water and chemicals must be used for this process. By introducing one electric pure water manufacturing device, the Matsumoto Factory is now able to continually create pure water without needing to use chemicals to regenerate ion exchange resins. Accordingly, the factory is no longer required to use regenerative chemicals to treat wastewater, an accomplishment that helped reduce usage volumes of electricity, water resources, and chemicals and lower the total costs of manufacturing pure water.</p> <p><b>Installation of wastewater recovery systems (Integrated Water Management):</b>                      Wastewater from factories is expelled into public sewer systems after undergoing final treatment. After installing wastewater recovery systems, the Matsumoto Factory has been conducting recycling processes (filtration via coagulation sedimentation) for wastewater to enable this water to be reused in factory cooling towers, toilets, and other facilities (approximately 1,000 tons reused each day).</p>	 <p>IWM : Integrated Water Management</p>

**Water Consumption and Water Consumption per Unit of Production in Japan**



\* The amount of water consumed for the amount of production (Presenting FY2010 level as 100)

## Water Consumption and Water Consumption per Unit of Production Overseas



\* The amount of water consumed for the amount of production (Presenting FY2011 level as 100)

Note: In fiscal 2014, two new factories were added to the scope of consolidation (Fuji Electric (Zhuhai) Co., Ltd. and Shanghai Electric Fuji Electric Power Technology (Wuxi) Co., Ltd.).

## Water consumption in Japan

Unit : thousand tons

	Purchased water	Groundwater intake volume	Total water consumption
FY 2010	4,416	4,272	8,688
FY 2011	3,272	3,902	7,174
FY 2012	3,251	3,720	6,971
FY 2013	2,990	3,931	6,921
FY 2014	3,072	4,086	7,158
FY 2015	2,911	3,886	6,797

Note: Purchased water is the volume of industrial-use and clean water. Overseas, we consumed all water purchased.

## Recycled water

Unit : thousand tons

	In Japan	Overseas	Total
FY 2012	800	84	884
FY 2013	903	188	1,091
FY 2014	929	211	1,140
FY 2015	901	207	1,108

Note: Reused waste water (waste water collection system (IWM: Integrated Water Management)) has been retroactively added to domestic recycled water going back to fiscal 2012.

## Efficient use of resources, Reduction of raw materials

When designing products, Fuji Electric conducts product assessments to evaluate the effectiveness of resource usage. Efforts to effectively utilize resources through product designs include making products that are more compact, weigh less, and have longer lifespans and avoiding usage of regulated, harmful chemical substances. In regard to manufacturing, meanwhile, we focus on effectively utilizing materials, decreasing the number of defective products created, and reducing packaging.

Furthermore, we have defined waste volume per unit of sales at production facilities as a management index for efforts to reduce the usage of raw materials and have set the target of realizing a 25% reduction in this index (versus 2006) by 2020.

### Case Example of Initiatives to Reduce Waste Emissions and Save Resources Related to Products

We promote the 3Rs (reduce, reuse, recycle) in our vending machine products in an effort to reduce waste emissions. Specifically, other efforts include reducing the size and weight of products to save resources, and printing warning labels directly on the inside of container lids to reduce materials used in labels.

In addition, we have successfully realized smaller packages for SiC semiconductors with 75% less volume than that of conventional

semiconductors. Also, our large-capacity UPSs, which employ new power devices, have been made 30% smaller. Through these efforts, we have succeeded in substantially reducing the resources and materials used in our products.

## Environmental Impact Reduction Across Entire Product Lifecycles

Fuji Electric aims to reduce environment impacts across entire product lifecycles. To this end, we conduct product assessments and design reviews during the design phase to evaluate the environmental performance of products.

These evaluations look at a wide range of environment factors, including energy- and resource-saving properties as well as the usage of harmful chemicals, ability to contribute to lower chemical usage during manufacturing processes, transportation concerns, and other factors related to the realization of a sustainable society. Through these evaluations, we are working to reduce environmental impacts.

### Eco-Product Certification System

Fuji Electric is developing eco-friendly products, which enhance energy efficiency and reduce the use of chemical substances, and environmental contribution products, which help reduce society's overall impact on the environment. We are continuing to promote the spread of these products.

In this initiative, Fuji Electric has established a common Fuji Electric Eco-Product Certification System. We evaluate the degree of product eco-friendliness on a Company-wide platform. Products meeting fixed criteria are certified as "eco-products," while those that are at the top of the industry for environmental benefit and contribution, and which are recognized outside the Company at the national level for environmental superiority are labeled "super eco-products."

### Eco-Product Certification System



Eco-Product Definitions	
Eco-Friendly Products	Products that have a reduced environmental impact over the entire product lifecycle. These products are superior to traditional products in at least four of six standard areas, including energy conservation, resource conservation, and recyclability.
Environmental Contribution Products	Products that contribute to environmental preservation during use. Products that contribute to the environment by utilizing natural energy or information and communication technology.

### Fiscal 2015 Super Eco-Products

#### TOPICS

**"Aerosol Analyzers;  
Awarded 2015 (58th) 10 Greatest Innovations Prize by NIKKAN KOGYO SHIMBUN, LTD.**

Fuji Electric's aerosol analyzers decipher the content of airborne PM2.5 particles, contributing to air pollution prevention by elucidating previously unseen truths. Employing a combination of several cutting-edge measurement methods, these analyzers continually and simultaneously record the size and number of aerosols as well as their chemical content (nitrate, sulfate, and black carbon) with high accuracy.

Previously, sampling and analyzing aerosol chemical contents was a process that had to be conducted by hand and could take more than eight hours. Our analyzers, however, have greatly cut the time required for such analyses by measuring contents automatically in 15-minute cycles and almost in real time.

The analyzers are primarily controlled via a touch panel on their front, which also displays measurement data, operational status information, and alerts.



#### ■Ratio of Eco-Product Sales

In fiscal 2015, we investigated the connection between factory production values and sales for each product segment to establish a better understanding of the amount of sales of Company products, which provides the denominator for calculating the ratio of sales attributable to eco-products. The fiscal 2015 ratio of sales attributable to eco-products (ratio of sales of Company products attributable to eco-products) was 58%, exceeding our target of 48%.

Furthermore, an additional three products were designated as super eco-products in fiscal 2015, making for a total of 27.  
In fiscal 2016, we will target a ratio of 70% by identifying products that qualify as eco-products and proceeding with their certification.