

Top Message	Interview to Head of Corporate Environmental Strategy Unit	Special Feature: The Power of ICT	Fujitsu Group Environmental Action Plan Stage VII	Chapter I Contribution to Society	<b>Chapter II Reducing Our Environmental Burden</b>	Environmental Management	Data Overview
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Reducing Greenhouse Gases (GHG) Emissions and Boosting Energy Intensity at Our Business Sites | Promoting Environmentally Conscious Datacenters | Reduce CO<sub>2</sub> Emissions from Logistics and Transportation | Promoting CO<sub>2</sub> Emission Reductions with Our Business Partners | Increasing Amounts of Renewable Energy Used | Efficient Use of Water Resources | Reducing Chemical Substances Emissions | **Limiting Amounts of Waste Generated** | Product Recycling

## Limiting Amounts of Waste Generated

### Our Approach

The Fujitsu Group sees waste as a valuable resource and continuously works to recover resources from our waste, or to use that waste as an energy source. In Japan, we have been reducing our final disposal amounts every year. However, given the difficulty of building new disposal sites, and the limited lifespans of existing sites, the environment surrounding our waste disposal is as challenging as ever. By proactively installing equipment and reusing waste, we are working to follow the stipulations in Japan's Fundamental Law for Establishing a Sound Material-Cycle Society to 1) reduce waste generated, 2) reuse waste, 3) recycle waste, and 4) recover heat from waste. We do this in order to reduce the amounts of waste acid, waste alkali, and sludge generated in our production of semiconductors and printed circuit boards.

### Summary of FY 2013 Achievements

Targets under the Fujitsu Group Environmental Action Plan (Stage VII) (toward FY 2015)	Reduce the amount of waste to less than the average level of FY 2007-2011 <b>(amount of waste: 31,134 tons)</b> Keep Zero Emission in factories in Japan.
FY 2013 Key Performance	Waste generated: <b>23,522 tons</b> Achieved <b>Zero Emissions</b> at domestic business sites.

### FY 2013 Performance and Results

#### Installed Equipment, Treated Waste In-House, and Converted Waste to Value-Added Material

We implemented measures including installing vacuum dehydration dryers at our Nagano Plant to reduce (by 595 tons) electroless copper plating wastewater, using in-house treatment at Shinko Electric Industries to reduce alkali wastewater (by 300 tons), and converting sulfuric acid waste (228 tons), used at Fujitsu Semiconductor Technology, Inc. in the cleaning steps of the semiconductor manufacturing process, into value-added material.

#### Achieved Zero Emissions at All Business Sites

We were able to meet our target by holding waste generation to 23,522 tons (generation rate per unit of sales: 0.49

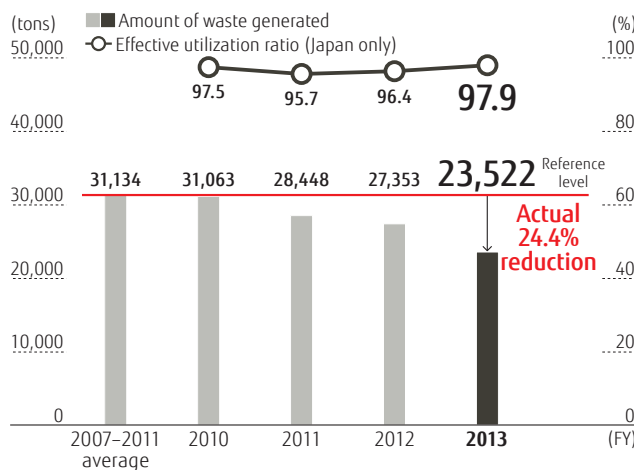
tons/100 mill. yen). Additionally, we were able to achieve zero emissions at all of our domestic business sites by bringing a portion of business sites that had not achieved zero emissions by FY 2012, up to zero emission levels.

### Breakdown of Waste Generated, Effective Utilization, and Final Disposal

Waste Type	Waste Generated	Effective Utilization	Final Disposal
Sludge	4,750	4,544	206
Waste oil	1,670	1,503	167
Waste acid	2,832	2,831	1
Waste alkali	3,516	3,514	2
Waste plastic	3,720	3,637	83
Waste wood	1,228	1,228	0
Waste metal	570	568	2
Glass/ceramic waste	371	371	0
Other*	4,865	3,492	1,373
<b>Total</b>	<b>23,522</b>	<b>21,688</b>	<b>1,834</b>

\* Other includes general waste, paper waste, septic tank sludge, residue, rubble, textile waste, animal and plant residue, and infectious waste.

### Trends in Amount of Waste Generated and Effective Utilization Ratio



### FY 2014 Targets and Plans

#### Continue to Limit Waste Generation

We will strive to "Reduce the amount of waste to less than 31,134 tons," and "Keep Zero Emissions in factories in Japan" as we work to limit waste generation by continuously installing equipment and reusing resources.

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## Main Activities in FY 2013

### Separating Heavy Metals from Electroless Copper Wastewater with Vacuum Dehydration Dryers

At our Nagano Plant, the conventional wastewater processing technology faced difficulties in separating solids from liquids through chemical processing of electroless copper wastewater.

In response, Fujitsu Facilities Limited started working on a vacuum dehydration dryer that can separate solids from distilled water, regardless of the ingredients of the wastewater, by utilizing a principle whereby depressurized (approximately -0.1 MPa) water reaches a boiling state around 50°C.

Expecting that this technology could be applied to electroless copper wastewater, tests were carried out on actual wastewater. Results showed that the solid constituents, such as heavy metals, etc., contained in electroless copper wastewater could be separated. We decided that the system, which also had the benefit of low daily maintenance needs due to its simple design, would be adopted at the Nagano Plant.

When installing the system, we incorporated some operational upgrades and customizations so that raw wastewater, from wastewater tanks in each building, and distilled water are automatically transferred. In addition, we added features that measured the solids, automatically notified when drums needed changing, simplified the way drums are moved, and simplified the transportation of the solids. Installing this equipment has brought annual industrial waste reductions of 595 tons.

Vacuum Dehydration Dryer



### Reusing Sulfuric Acid for the Neutralization Treatment of Wastewater

Fujitsu Semiconductor Technology, Inc. uses sulfuric acid in the cleaning steps of semiconductor manufacturing at its main plant.

Since there are high concentrations of hydrogen peroxide in the sulfuric acid drained from the first cleaning line, we have, up to now, treated this as an industrial waste product and outsourced processing to an external company. At the same time, we were using industrial-grade sulfuric acid in the neutralizer of our wastewater treatment facility.

As a result of examining whether we could reuse the drained sulfuric acid as a neutralizer in the wastewater treatment facility, we found that it was indeed possible, however, the hydrogen peroxide caused ill effects (corrosion) in the facility and pipes. We realized that further measures were needed. In response, in FY 2012, we switched wastewater treatment facilities and pipes, etc. to components with high chemical resistance, in order to combat the corrosion. After running tests and checks, we began reusing the drained sulfuric acid, repurposed as the neutralizer, from April 2013. As a result, we were able to achieve reductions of 228 tons annually in both the amount of waste generated we emitted and the industrial sulfuric acid we purchased.