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 2015 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

(amount of waste: **31,134 tons**)

Keep Zero Emission in factories in Japan.

FY 2015 Key Performance

Waste generated: **20,660 tons**

Achieved **Zero Emissions** at Japan's business sites.

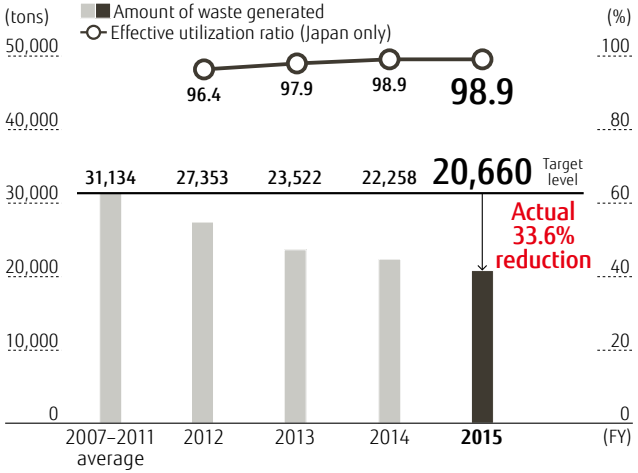
FY 2015 Performance and Results

Reduced Waste Amount and Converted Waste to Value-Added Material

We treated waste flux water in-house at Shinko Electric Industries Co., Ltd., reducing the amount by 114 tons, installed electrolysis equipment to recover copper at our Nagano plant, reducing the amount of sludge generated by 74 tons, converted concentrated organic alkali into value-added material at Aizu Fujitsu Semiconductor Manufacturing Limited, reducing the amount by 41 tons, and converted 12 tons of aluminum evaporation bags into value-added material at Shimane Fujitsu Limited.

As a result, Waste generation was 20,660 tons (generation rate per unit of sales: 0.44 tons/100 mill. yen). Additionally, we were able to maintain zero emissions at all of our Japanese business sites.

Trends in Amount of Waste Generated and Effective Utilization Ratio



Breakdown of Waste Generated, Effective Utilization, and Final Disposal

(tons)

Waste Type	Waste Generated	Effective Utilization	Final Disposal
Sludge	4,425	4,326	99
Waste oil	946	803	143
Waste acid	3,007	3,007	1
Waste alkali	3,073	3,068	5
Waste plastic	3,167	3,097	70
Waste wood	1,042	1,040	1
Waste metal	708	707	1
Glass/ceramic waste	366	363	3
Other*	3,927	3,105	822
Total	20,660	19,517	1,144

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

FY 2016 Targets and Plans

Continue to Limit Waste Generation

Environmental Action Plan (Stage VIII) covering FY 2016-18 includes the target to "Reduce the amount of waste to less than the average level of FY 2012-2014 (25,568 tons)." Following on from efforts that were part of Environmental Action Plan (Stage VII), we are aiming to achieve our low waste target by installing equipment and reusing resources.

Limiting Amounts of Waste Generated

Main Activities in FY 2015

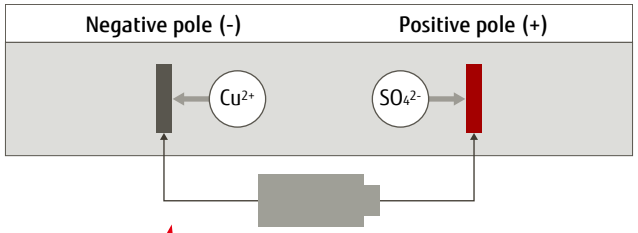
Reducing Sludge Generation by Installing Copper Recovery Electrolysis Equipment

The used stripping solution containing copper emitted during the production of printed circuit boards at our Nagano Plant has a high copper concentration above 30,000 ppm. Since we did not have an independent system for treating this used water, it was being slowly mixed and diluted with low-concentration used water, treated in our existing system and separated into sludge and water discharged into a river.

However, since a large amount of chemicals was needed in proportion to the concentration levels of the water being diluted and treated, there was still an increased amount of sludge being generated. To address this challenge, Fujitsu Facilities Limited looked into whether equipment could be developed that would effectively recover just the copper and reduce the amount of sludge. Attention focused on a copper recovery apparatus that uses electric current to cause a chemical reaction (electrolyzing the used water) so that copper could be removed. Before adopting the system, we borrowed a test device from the manufacturer and experimented with pH, temperature, and treatment time to see how the system would handle used water with different properties released from each building in the plant. With results showing a very high level of purity for the recovered copper compared to other copper recovery equipment, we judged the system optimal for addressing our existing need.

Furthermore, the initiative extended beyond simply installing the system. We collaborated with a water treatment installation company to review an integrated system that included moving raw water from used water tanks, pre-treating used water, and recovering copper. We were able to build an original, fully automated system at our Nagano plant. Installing this equipment has brought annual industrial waste reductions of 74 tons and has allowed us to decrease the types and amounts of chemicals we use.

The principle of electrolysis

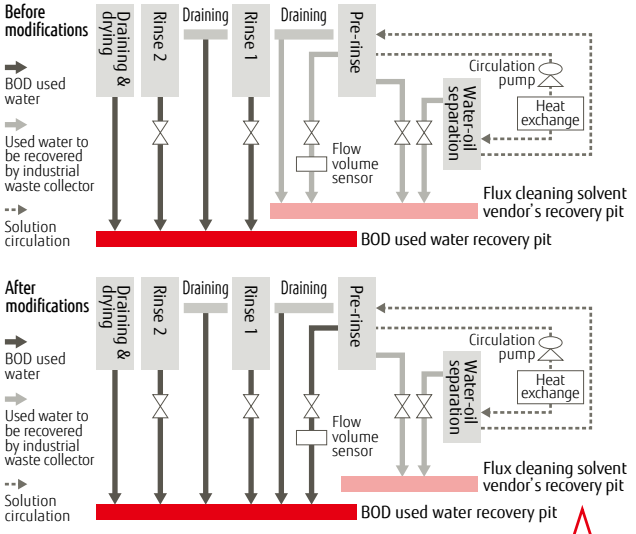


Passing voltage through the chemical compound (used water) triggers an oxidation reaction at the anode and a reduction reaction at the cathode thereby producing positively charged copper at the cathode.

Reducing Flux Used Water by Making Changes to Pipes

At Shinko Electric Industries Co., Ltd., we treated all of the flux wastewater used for cleaning circuit boards as industrial waste. By managing intake and release water so that the used water from cleaning is connected to a BOD used water recovery pit, we have been able to create in-house treatment technology. Taking care of treatment on site has led to a reduction in the amount of industrial waste by 114 tons/year.

Re-routing Flux Cleaning Water with an Electrical Conductivity Control System



The in-house treatment system takes wastewater that has been drained or has passed through the flow sensor and re-routes it to a BOD used water recovery pit instead of the cleaning solvent vendor's recovery pit.