

Efficient Use of Water Resources

Fuji Electric promotes the 3Rs (reduce, reuse, recycle) across the supply chain in accordance with its Basic Environmental Protection Policy and Environmental Vision 2050 in order to contribute to the realization of a recycling-oriented society. As part of these activities, we seek to make efficient use of water resources while complying with wastewater requirements.

Efficient Use of Water Resources

In light of the problem of global water resource depletion, Fuji Electric has been advancing measures to comply with wastewater requirements and reduce water usage amounts and is now working to achieve more effective use of water resources. Targets have been set for water intake and for water intake per unit of net sales, and initiatives for accomplishing these targets were carried out in fiscal 2020.

In fiscal 2020, our water intake in Japan increased 1.6% year on year due to the impact of investments in production capacity expansion in the semiconductor business, which uses a lot of water in the production process. Overseas however, we reduced water intake by 3.4% year on year at our plant in Malaysia, one of the key sites for the semiconductor business, mainly by undertaking water intake reduction activities. As a result, we achieved a 3.3% year-on-year reduction in water intake across all of our overseas locations. Combined with our Japan operations, our global water intake decreased 0.5% year on year.

Our efforts to effectively utilize water resources are focused on water recycling.

In fiscal 2020 we recycled 3,004,000 tons of water, a year-on-year increase of 11.3%. The recycling rate* came to 18.4%, up 1.8% year on year. Since fiscal 2019 we have increased our water recycling rate by implementing measures to combat filter membrane clogging at the Matsumoto Factory.

* Recycling rate: Volume recycled/ Volume used (volume consumed + volume recycled)

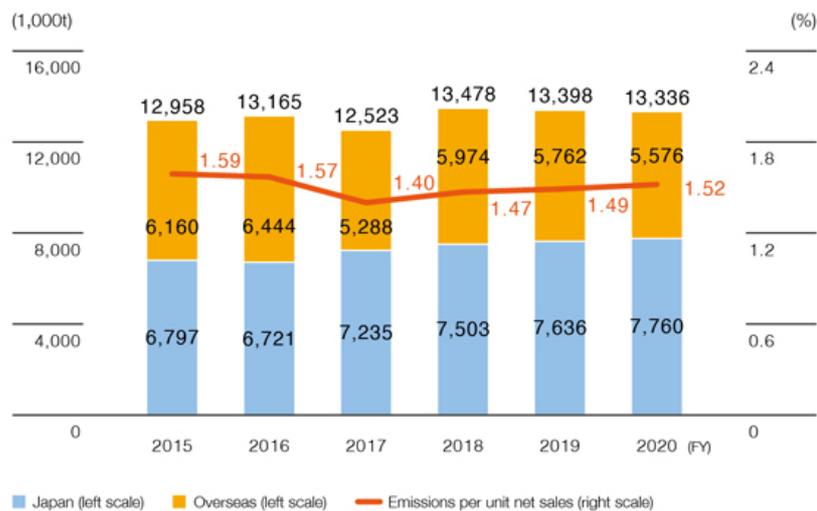
Water Intake (Global)

Note: Japan — volume of clean water purchased + volume of industrial water purchased + volume of groundwater used (only groundwater*1 used in production activities)

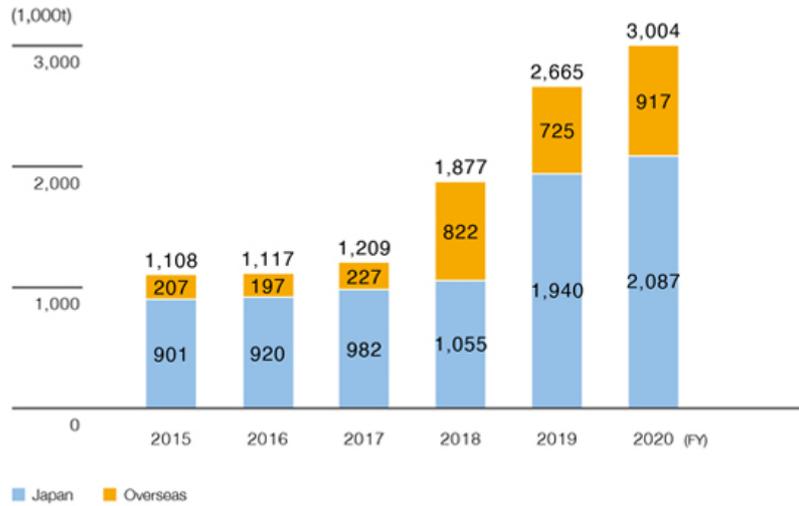
Overseas: Industrial water*2

*1 Volume of groundwater does not include groundwater used for soil cleanup, for agricultural purposes, or for melting snow.

*2 Roughly 1,000 tons of groundwater is used annually at Fuji Electric Consul Neowatt, our new subsidiary in India (acquired in fiscal 2019)



Recycled water



[Water Risk Assessments]

Fuji Electric carries out assessments*1 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.

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

*1 Comprehensive judgment of a base's water stress based on three indices

Status of Shenzhen Factory (production facility with water risk)

The Shenzhen Factory is our only facility in the region deemed to have a water risk. Reliable supply of water is essential for the production of photoconductors. Since water supply is restricted during the dry season, we are taking two major risk countermeasures.

First, we are installing water tanks. This enables us to avoid any impact even if water supply is temporarily suspended. Second, we are introducing equipment to recycle wastewater. Our current recycling rate is 80%, which is higher than the 70% target decided by Shenzhen City. This has helped us build a good relationships with the local government and establish a production system that allows for the stable use of water.

Water purchased and used at our sole facility with water risk

Status of facility with water risk	FY2018	FY2019	FY2020
Volume of water purchased (thousand tons)	252	242	256
Volume of water consumed (thousand tons)	454	436	461
Risk ratio	1.9%	1.8%	1.9%

(Note) Water usage: Volume of Water purchased + recycled

(Note) Water risk ratio: Volume of water purchased (Shenzhen Factory) / Total Group water consumption

Status of water intake management

Most of Fuji Electric's production facilities are located in industrial parks, which are supplied with both industrial water and clean (drinkable) water. In addition, some of our facilities use groundwater. We provide a local government with annual reports on groundwater intake volumes and make efforts to optimize water intake volumes in each region. We use groundwater at 15 of our 21 domestic facilities, and groundwater accounts for 50.2% of our total water intake volume. (The groundwater intake volumes to report represent only groundwater used for production.)

In the past, intake of groundwater has been a cause of land subsidence in Japan, which is a social problem. Today, however, the government determines the appropriate level of water intake for each area and adjusts groundwater levels. Accordingly, social issues like land subsidence caused by water intake are almost non-existent.

All of our overseas facilities* use only industrial water supplied to their respective industrial parks for production use.

Moreover, we promote recycling to control water intake volumes at five production bases: our four semiconductor front-end processing facilities (Matsumoto, Yamanashi, Tsugaru, and Malaysia), which consume particularly large amounts of water, plus the Shenzhen Factory.

At other bases, as well, we invest in water recycling, implement water conservation measures, repair leaks, and install above-ground piping (visualization) to reduce water intake in cases where ISO 14001 environmental impact assessments identify impacts due to water consumption.

* Roughly 1,000 tons of groundwater is used annually at Fuji Electric Consul Neowatt, our new subsidiary in India (acquired in fiscal 2019)

Status of wastewater management

We strictly control wastewater at factories that use chemical substances. We have also established our own standards for wastewater management, which are stricter than those mandated legally. If an abnormality is detected in the wastewater treatment system, we have resident repair personnel in place to respond immediately. If we detect inadequate pH adjustment or similar problem, our drainage outlets are automatically shut down to prevent wastewater

that does not meet official standards from being discharged externally. This substandard wastewater is kept in drainage reservoirs until remediation is completed.

By strictly managing wastewater in these ways, we strive to minimize the impact of our activities on the ecosystem.

Efforts to effectively utilize water at our production sites

At our Malaysia Factory, which uses large amounts of water, we have set a water intake reduction target of 30% by 2020 (versus 2011). We have systematically reduced water intake mainly by improving management standards for water-consuming production equipment and introducing pure-water recycling facilities. However, partly due to the impact of increased production, in fiscal 2020 we only managed to lower water intake by 27.6% compared to 2011. We will continue to pursue water recycling efforts up ahead and further enhance our reduction activities.

Matsumoto Factory initiatives	
Our Matsumoto Factory, where we make semiconductor wafers, uses large amounts of pure water in the wafer fabrication process and a lot of water for cooling production equipment. Therefore, it is important that we reduce water usage and utilize our water resources effectively.	
<p>Pure-water recycling initiatives:</p> <p>Wastewater from the manufacturing process is sorted and relatively high-quality portions are recycled as raw water for pure water production.</p> <p>To enhance recovery of wastewater from the washing process, we have successfully made bioactivated carbon filters with Microbacteriaceae, known for its treatment capability of organic substances, and thus improved the recovery rate. For wastewater containing fluorine, which is harmful to the environment, we have introduced a dedicated wastewater recovery system that uses a reverse osmosis membrane to concentrate wastewater and reduce its volume. Moreover, clean water that has passed through the membrane is reused as raw water for making pure water.</p> <p>Reducing chemical use at hydrofluoric acid treatment facilities:</p> <p>The water purification process requires regular regeneration of ion exchange resins. This produces a mixture of acidic and alkaline wastewater that previously was discharged into the public sewage system after terminal treatment. In response, we devised and introduced a new wastewater recycling system that separates high-concentration alkaline solution from wastewater and reuses it to adjust pH levels as required in hydrofluoric acid treatment equipment. This enabled us to reduce the amount of chemicals used, as well as overall costs.</p> <p>Improved wastewater recovery system using integrated wastewater management (IWM):</p> <p>For the factory's final treatment process, we installed an integrated wastewater management (IWM) system. Under the system, wastewater that previously was discharged into the public sewage system is reclaimed (through filtration treatment and the like) and reused as water for the plant's cooling towers and toilets (approximately 1,000 tons/day).</p> <p>In fiscal 2020, improvements to how we maintain filtration membranes, among other measures, further boosted the wastewater recovery rate.</p>	 <p>IWM : Integrated Wastewater Management</p>