

Solve Issues Related to Water Resources

Customer Example

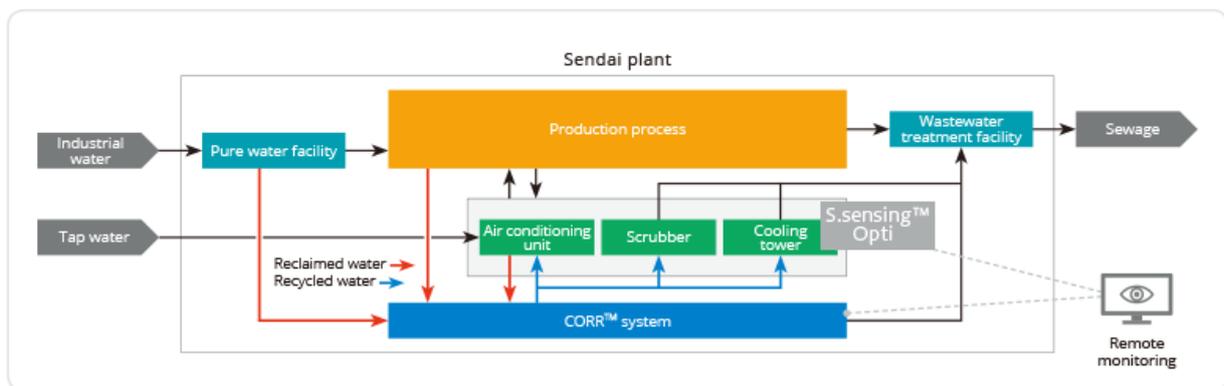
Kurita’s Recycled Water Supply Service to Reduces Water Usage at the Sendai Plant of Kanazawa Murata Manufacturing

Reductions of **40%** in Tap Water Usage and **30%** in Sewage

At the electronic components manufacturer Kanazawa Murata Manufacturing Co., Ltd., an environmental initiative based on the Murata Manufacturing group’s environmental action plan is under way. The Group has set a target for reducing water usage per production volume, and has set about reducing the volume of water used at its Sendai plant. Kurita Water Industries proposed a recycled water supply service that reclaims and recycles wastewater to help this customer achieve its goals. The service is a contract with the customer to supply recycled water, including operation and management of the CORR™ wastewater reclamation system. In applying this service, we cooperated with the customer to investigate the volume and quality of the reclaimable wastewater at each outlet, and to select areas for use of the recycled water depending on its quality. In this case, since the recycled water is used as make-up water for a cooling water system, we also provided cooling water quality management using the S.sensing™ Opti remote monitoring system.

Using the service has enabled the customer to use water in the plant more efficiently, and the customer expects to achieve reductions of 40% for tap water and 30% for sewage compared to fiscal 2018.

Conceptual Diagram of Recycled Water Supply Service



Voice of the Customer

Since introducing this service, we are delighted to have achieved the reductive effect on water usage as initially planned, as well as reducing labor for facility management. Furthermore, when we were at the stage of considering applications, various departments of Kurita Water Industries helped us to maximize the benefits of water usage reduction, demonstrating Kurita’s powerful capabilities. We are now looking forward to receiving proposals for further reducing our environmental impact by expanding the scope of application and looking at management of water facilities throughout our entire plant.



Mr. Etsuhiro Saito
Administration SEC
Sendai Plant

Water saving example at Teijin Polycarbonate China Ltd. (Initiative by Kurita Water Industries (Dalian) Co., Ltd.)

Water usage Reduced by **30%**

Teijin Polycarbonate China Ltd. manufactures polycarbonate in China. China's annual water resource per person is significantly lower than the global average, causing environmental regulations on matters such as water usage restriction and water quality of wastewater to grow tighter every year. Some regional regulations are tougher than the national regulations, and Teijin Polycarbonate China faced an urgent task to reduce its water usage.

Kurita Water Industries (Dalian) Co., Ltd. worked with the customer to check the volumes of water use and wastewater, as well as water quality, for the entire plant. Then, we proposed using an RO membrane facility* to treat and reclaim water from cooling facilities and plant waste water with a low degree of contamination. The customer accepted the proposal, which has enabled a reduction of around 30% in water use across the entire plant.

※A facility for filtering water using a reverse osmosis (RO) membrane that allows water to pass through while preventing the passage of impurities such as ions and bacteria.

Voice of the Customer

Reducing the volume of water usage was a major challenge for us. We are very grateful for this proposal for an appropriate countermeasure, which has delivered the expected results.

Now we have asked Kurita to look into ways to further increase the volume of water that we reuse. We look forward to your continued assistance.

RO membrane facility



Manufacturing Department Manager
Masahiro Ishida

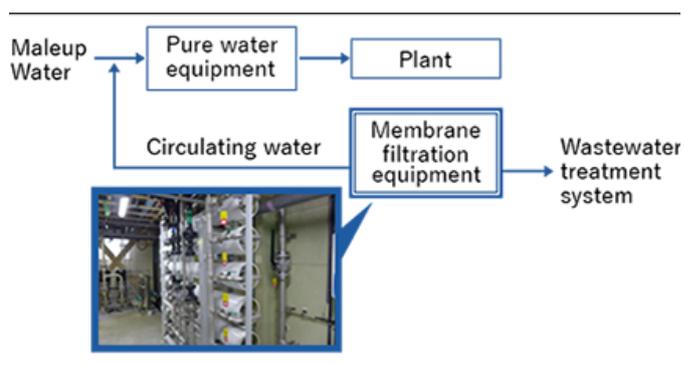
*Position is as of fiscal 2019.

**Water saving example at SHINKO ELECTRIC INDUSTRIES CO., LTD. Takaoka Plant
(Initiative by Kurita Water Industries Ltd.)**

Annual water consumption Reduced by **25,000m³**

SHINKO ELECTRIC INDUSTRIES CO., LTD. mainly manufactures semiconductor packages that achieve the miniaturization and high functionalization of electronics products. The company positions environmental protection as one of its top management policies. To minimize water consumption at its plants, this customer collects and reuses as much water used for production as possible. However, the properties of the discharged water changed when the company modified the production volume and method in response to changes in its business environment. Consequently, it was becoming difficult to maintain a balance between the quality and quantity of water used at its plants. Kurita Water Industries proposed an improvement measure, with which water quality is improved by removing organic constituents, which were affecting the quality of pure water, by means of membrane treatment. The customer adopted our proposal. As a result, the amount of reusable circulating water increased, and it became possible to reduce the amount of makeup water, enabling water consumption to be reduced by 25,000m³/year.

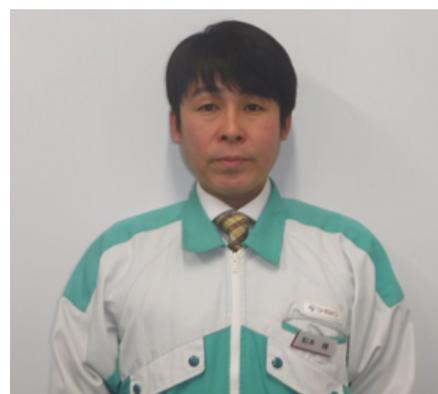
Flow chart



Voice of the Customer

We evaluate this proposal highly because it has enabled us to stabilize the quality of pure water and reduce the number of parts that are replaced due to the adhesion of dirt from organic constituents.

We expect Kurita to give us further proposals for reducing the environmental impact of our plants and ensuring stable operations.



Mr. Takeshi Matsuki
Manager of Facilities Management Department II ,
Environmental Management Division
*Position is as of fiscal 2018.

Realize Sustainable Energy Use

Customer Example

Energy Creation at Fuji Clean

Reducing annual CO₂ emissions by **10,000 t**

Fuji Clean Co., Ltd.'s businesses range from collection and transportation of waste to intermediate treatment* and final disposal in landfill. It contributes to society through safe treatment of waste. Fuji Clean developed a concept of creating renewable energy by methane fermentation of waste, and contributing to the local community that provides the waste by supplying electric power and heat during disasters. Since the areas surrounding the company's facilities and the area downstream are prospering agricultural areas, the company needed a treatment that did not produce wastewater, and was seeking for a partner with suitable technologies. Kurita Water Industries proposed production of biogas from waste using the dry methane fermentation technology that it has developed over many years. This methane fermentation technology is able to treat waste such as paper waste, which has a high organic matter content and low water content, and does not produce wastewater. Since it met Fuji Clean's requirements, the proposal was accepted. Moreover, through this proposal, Fuji Clean's project was selected as the Demonstration Project for Regional Autonomous Biomass Energy System by the New Energy and Industrial Technology Development Organization (NEDO), and is currently being trialed. Furthermore, the biogas generated by the dry methane fermentation reactor is used as fuel for an onsite boiler and power generator, reducing the use of electricity and fossil fuels, and attendant CO₂ emissions.

* Intermediate treatment: Minimizing the volume of waste for landfill by separating it and then crushing or incinerating it.

Voice of the Customer

We decided to adopt Kurita Water Industries' dry methane fermentation technology because it was suitable not only for our vision, but also for the condition of the waste that we receive. Since the types and volume of waste change day by day, we encountered some difficulty in setting up a dry methane fermentation reactor, but we were glad have Kurita alongside us as we strove to establish a method for operation and management. We hope to receive further input from Kurita on biogas generation, as well as cooperation on our social contribution activities.

Dry methane fermentation reactor



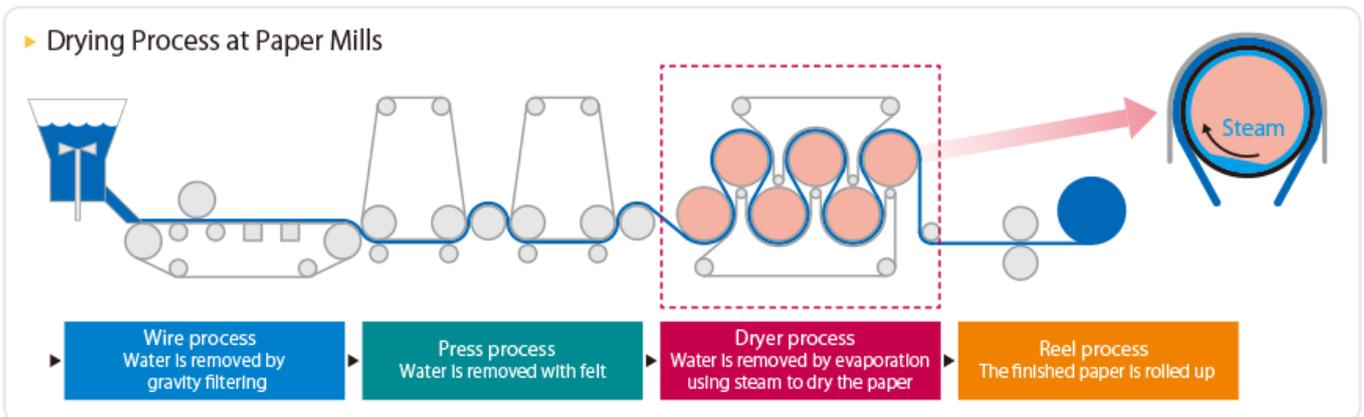
Mr. Hisato Kinjo
General Manager, Renewable Energy Department
Dry Methane Fermentation Plant

Examples of Energy-Use Reduction at Paper Mills (Initiative by Kurita Water Industries Ltd.)

Per-unit Use of Steam Reduced by **5 to 10%**

At paper mills, paper is created through a pulping process and paper-milling process. In the paper milling process, the water content is removed from the wet paper that will become the finished paper through application of pressure and a mechanical water removal process. After that, the paper is dried with a dryer and rolled up. The dryer used in this process is formed from a metal cylinder. The paper is spread over the surface, which is then heated. To heat the dryer, steam is passed through the interior. Heating accounts for most of the overall energy usage at the plants. Therefore, reducing the energy used in the process was an important challenge at paper mills.

Kurita Water Industries noted that water from the steam adhering to the inside of the dryer caused a drop in heat conduction efficiency. At many paper mills we have proposed adding a water treatment chemical that forms a water-repellent film to the steam, so that the film adheres to the inside of the dryer and improves heat conduction efficiency. Plants that have adopted this proposal are able to reduce their per-unit use of steam by around 5-10% per year on average, with the reduction in energy leading to a reduction in CO₂ emissions.



Examples of Energy-Use Reduction at Daicel Safety Systems Inc. (Initiative by Kurita Water Industries Ltd.)

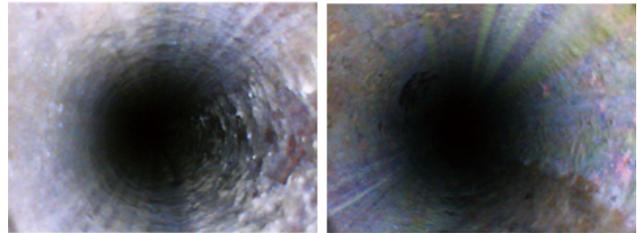
Electric power consumption Reduced by **44%**

Daicel Safety Systems Inc., which mainly produces inflators for car airbags, needed to improve the energy efficiency of its businesses activities in line with the Daicel Group's Responsible Care Basic Policy.

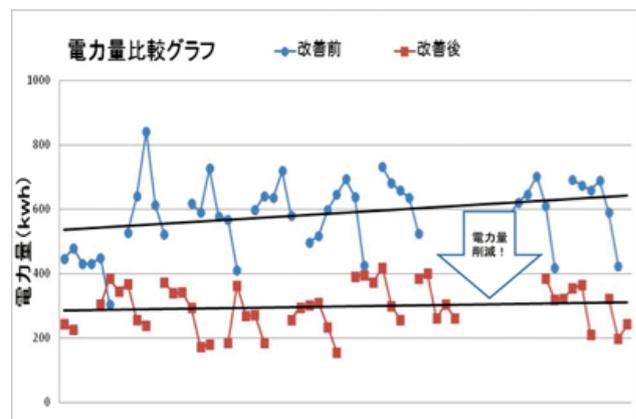
For this customer, one of the issues was improving the energy efficiency and reducing energy use of its cooling water equipment for air conditioning. Kurita Water Industries proposed first removing scales that formed on the heat exchanger of the cooling water equipment and then inhibiting their formation using water treatment chemicals.

Having adopted these proposals, the Company reduced power use 44% by optimizing the heat exchange efficiency of the cooling water facilities, and it was possible to maintain those benefits.

Heat exchanger interior before the cleaning (left)
After cleaning (right)



Comparison of electricity use before and after proposal adopted



Voice of the Customer

We thought highly of Kurita Water Industries' proposal because it was appropriate for the issues we faced and it was possible to dramatically reduce energy use as expected.

In the future, we expect to work with Kurita Water Industries to introduce the proposal horizontally throughout the plant and receive other proposals to improve the quality of industrial water.



Mr. Kosuke Inoue
Production Engineering
Department

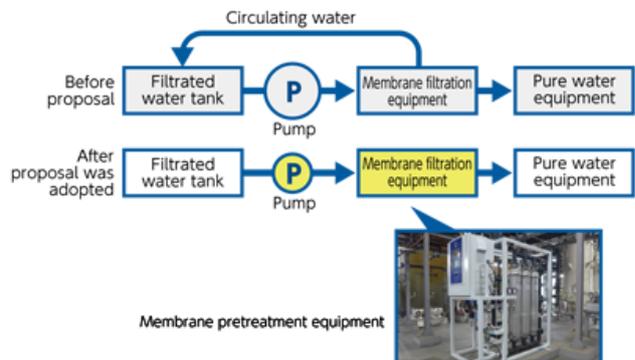
*Position is as of fiscal 2018.

Examples of Energy-Use Reduction at HGST Japan Ltd. (Initiative by Kurita Water Industries Ltd.)

Electric power consumption Reduced by **90%**

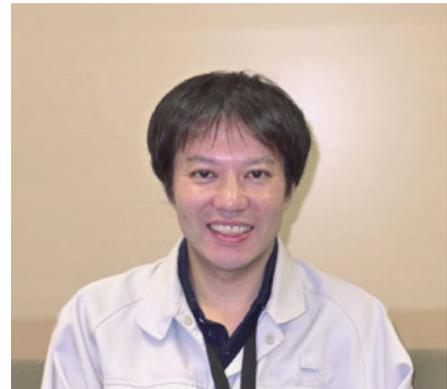
HGST Japan, a manufacturer of hard disk drives and other electronic devices, is striving to reduce the environmental impact of its business activities in line with the Western Digital Group's environmental policy.

For the customer, a continuous reduction in energy use became an issue because it is a designated energy management factory. Kurita Water Industries proposed replacing the membrane filtration equipment with a more efficient one. The previous equipment included a large pump because circulating water returning to the previous stage was necessary due to the original operational condition, but with the new equipment, a small pump can be used because circulating water is not required.



Voice of the Customer

In this case, the proposal was made when we were working to improve energy efficiency, and we adopted it as the improvement was easy to understand and there were substantial benefits. Replacing the old equipment with new smaller equipment made it easier to conduct maintenance and lowered costs, which was helpful. Improving energy efficiency is an ongoing issue, and we hope for additional proposals for improvements.



Mr. Haruki Chiba
Real estate operations
Facility engineering
Engineering Manager
*Position is as of fiscal 2018.

Reduce Waste

Customer Example

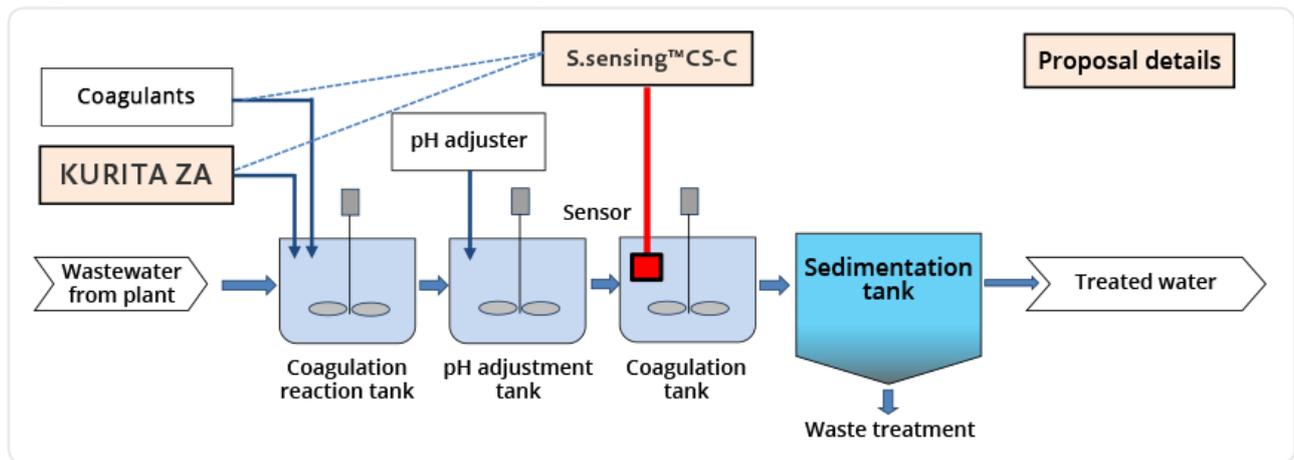
Reducing Waste at a Precision Equipment Manufacturing Plant

Reducing Waste Arising from Chemicals

At the plant of a customer who manufactures precision equipment in Thailand, wastewater from the manufacturing process is purified by coagulating suspended solids from the dicing process and so forth in a wastewater treatment facility. The coagulation process separates out matter suspended in the water by solidifying it into a mass using chemicals. The chemicals used are formed into a solid mass along with the suspended solids, and emitted as final waste product. Reducing the waste product at the plant was therefore a matter of reducing the amount of chemicals used.

Kurita-GK Chemical Co., Ltd. proposed using the water treatment chemical KURITA ZA to promote the coagulation effect of the chemicals used at the plant, and the introduction of the S.sensing™ CS-C sensor to confirm the coagulation status in real-time, allowing optimization of the amount of chemicals used. After implementing this proposal, the customer achieved a reduction of more than 80% in the amount of chemical usage, which led to an attendant reduction in the amount of chemical originated waste. Furthermore, since the coagulation status is now able to be grasped using the sensor, the customer is also able to reduce the amount of labor used in management.

Image of Wastewater Treatment Process and Proposal Details



Waste Reduction at Sabae Murata Manufacturing Co., Ltd. (Initiative by Kurita Meiki Ltd.)

Waste volume Reduced by **95%**

Electronics manufacturer Sabae Murata Manufacturing Co., Ltd. is part of the Murata Group, and is making efforts to reduce its environmental impact towards achieving the Group's medium-term environmental targets. Changes in the company's production items and an increase in production volume caused some of the production facilities to generate concentrated wastewater that could not be treated with its existing wastewater treatment facility. Since the entire volume of this was treated as waste, reducing the amount of concentrated wastewater became an urgent priority. Kurita Meiki proposed reducing the volume of concentrated wastewater using a vacuum concentrator. This equipment reduces the atmospheric pressure, causing the water content to evaporate at a lower boiling point and thereby reducing the volume. Heat is required to evaporate the water, but the evaporation heat is reclaimed using a heat pump and then reused for heating. After accepting the proposal, Sabae Murata Manufacturing Co., Ltd. was able to achieve a 95% decrease in the volume of concentrated wastewater that was treated as waste.

Voice of the Customer

Thanks to this proposal, we can now see the way forward to increasing production while reducing waste. Moreover, the proposal has been reported to the Murata Environment Committee and has also been highly appreciated by management. Waste reduction is a never-ending task, and we hope to receive further assistance from Kurita Meiki, going forward.

Vacuum concentrator



Mr. Daisuke Yokozawa
Team Leader,
Administration Section
*Position is as of fiscal 2019.

Waste Reduction at NIPPON SURFACTANT INDUSTRIES CO., LTD. Nasu Factory (Initiative by Kurita Water Industries Ltd.)

Reduction in waste amount **28.5%**

The Nasu Factory of NIPPON SURFACTANT INDUSTRIES CO., LTD. manufactures various chemical products that form the raw materials for pharmaceuticals, cosmetics, and so forth. The factory has acquired ISO 14001 certification and works continuously to reduce its environmental impact.

The company's wastewater processing facility was obliged to undertake sporadic pH adjustments and regular sludge removal to combat odors and destabilization of biological treatment caused mainly by coagulants. Moreover, the amount of chemical treatment usage was increasing, and elimination of the resulting sludge had become an issue. Kurita Water Industries proposed the use of a coagulant that did not contain the component that had been the primary cause of odors. The coagulant efficiently complemented the contaminant materials, so that the amount of additive could be reduced. This enabled a reduction in the amount of waste from coagulant as well. Furthermore, since the coagulant is slightly acidic, it had less of an impact on microbes. After the client accepted the proposal, their waste volume was successfully reduced by 28.5%.

Voice of the Customer

Kurita Water Industries' proposal not only reduced the amount of waste, but also reduced the amount of labor required for operation management and improve the level of safety. Since adopting the proposal, the frequency of sludge removal has been gradually declining, so we expect the amount of waste to decrease even further. We look forward to receiving more proposals from our trusted water treatment professional going forward.

Waste water treatment facility



Right/Mr. Riichi Ohoke
General Manager of Environment Division
Left/Mr. Masaru Tomizawa
Environment 2Group, Environment Division

*Position is as of fiscal 2018.