Consideration of the Environment

To contribute to the creation of a sustainable environment for future generations, the Shinko Group has made environmental protection a top management priority. We conduct our business activities in a well-planned and sustainable manner.

Environmental Policy

We have defined our responsibilities toward the global environment in an Environmental Policy, so that we can contribute to a healthy environment and rich society that will be handed down to future generations.

Environmental Policy

Based on the philosophy of the Shinko Way, we contribute to the protection and improvement of the global environment by pursuing harmony between the global environment and corporate activities, through manufacturing.

Guiding Principles

1. Accept that environmental challenges are fundamental to business continuity, and reduce our environmental impact.
2. Seek to reduce risk to human health and the environment.
3. Make every effort to perform our social responsibility by observing environmental regulations and standards in Japan and abroad.
4. Strive for continuous improvement of our environmental management system in order to enhance environmental performance.
5. Encourage our employees to contribute to global environmental conservation by tackling climate change, preserving biodiversity and using resources effectively.

We set environmental objectives to achieve this environmental policy, and this policy and the objectives are reviewed at least once a year.

President and Representative Director
SHINKO ELECTRIC INDUSTRIES CO., LTD.

Environmental Management

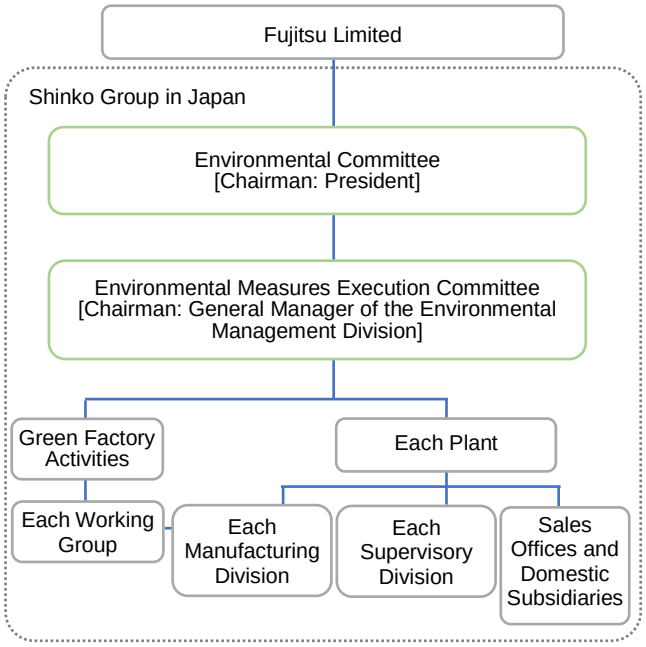
The Shinko Group in Japan has developed an environmental management system and employs the PDCA cycle in an effort to make continual improvements and enhance its environmental performance to practice eco-friendly business operations under its Environmental Policy. The Shinko Group in Japan has acquired ISO 14001 integrated certification as a member of the Fujitsu Group, and overseas manufacturing subsidiaries are certified by each company.

Below is a report on the activities of the Shinko Group in Japan.

Promotion System

We have established an environmental committee chaired by the President to promote environmental management. As the highest decision-making body related to environmental measures, the committee drafts, deliberates, and decides matters concerning environmental management.

We have also established an environmental measures execution committee as a subordinate organization to the environmental committee that deliberates matters such as the progress of activities to achieve environmental goals. Based on this promotion system, we maintain and improve our environmental management system and work to integrate activities to reduce environmental impacts into our business operations.



Identifying Environmental Challenges

To pursue even better, eco-friendly business operations, we clarify challenges and stakeholder requests related to the environment and perform an annual assessment of risks (deleterious impacts) and opportunities (beneficial impacts).

We view the results as environmental challenges, reflecting them in our environmental management system plans, and take actions to resolve them.

Environmental Audits

Every year we conduct our own internal environmental audit, in addition to one conducted by the Fujitsu Group, to check the effectiveness of our environmental management system and legal compliance.

The audits are conducted by internal environmental auditors, including environmental management system examiners (personnel qualified to examine ISO 14001 conformance). We continually improve our management system through the internal audits.

Response to Environmental Laws and Regulations

We strive to comply with national environmental laws and regulations as well as prefectural and city regulations, pollution prevention agreements, industry guidelines, and environmental requests from customers

There were no legal violations or accidents having serious impacts on the environment in FY2018.

Environmental Education

To encourage each and every employee to always act with the environment in mind and to continue to act as not only corporate activities but a good member living in society, the Shinko Group in Japan provides periodic environmental education to all employees. In FY2018, we incorporated content on the SDGs into educational materials in an effort to raise employee awareness leading to sustainable development.

We also provide environmental education adjusted for each type of work and hierarchy. As one example, training for newly appointed managers consists of education focusing on issues including the significance of management that keeps environmental conservation in mind, impressing such points as the fact that activities to reduce environmental impact lead directly to cost reduction.

Raising of Environmental Awareness

Every month, employees are sent information such as familiar themes matched to the season and environmental challenges relevant to Shinko. In energy saving activity, we publish news about on-site review meetings and examples of initiatives in an Energy Saving bulletin (Japanese language only) to share information within the Company.

In addition, to avoid disseminating only general information on the environment department's website, we have created a page where employees can submit requests and opinions.

The Environmental Action Program (Stage 8)

The Environmental Action Program (Stage 8) sets out environmental goals for FY2016 to FY2018. The Shinko Group in Japan established specific targets to achieve in a range of fields during these three years. During the period covered by Stage 8, we were forced to change the targets for reducing waste due to an increase in waste caused by changes the processes and chemicals used. Nevertheless, all goals were achieved for the Environmental Action Program.

* Self-assessment: ○ = Target achieved × = Target not achieved

Item	Environmental Action Program (Stage 8) target	FY2018 target	FY2018 results	Self-assessment*
Our Business Operations	Reducing CO_2 emissions from energy consumption ・Hold CO_2 emissions from energy consumption to within a 17% increase from the results for FY2013 by the end of FY2018	Hold growth in CO_2 emissions from energy consumption to the end of FY2018 to within a 16.4% of the results for FY2013	Held to within a 12.6% increase from the results for FY2013	○
	Reducing waste ・Hold growth in generation of waste to the end of FY2018 to within a 62.1% increase from the average for FY2012–FY2014	Hold growth in generation of waste to the end of FY2018 to within a 48.9% increase from the average for FY2012–FY2014	Held to within a 29.6% increase from the average for FY2012–FY2014	○
	Reducing water usage ・Implement measures to reduce water usage by the end of FY2018 by an amount equivalent to 5% of that used in FY2014	Implement measures to reduce water usage by the end of FY2018 by an amount equivalent to 1.3% of that used in FY2014	Implemented measures to reduce water usage by amount equivalent to 1.33% of that used in FY2014	○
	Promoting green procurement ・Promote initiatives to reduce CO_2 emissions in the supply chain 1. Submit requests and support to 100% of 1st tier suppliers that have 2nd tier suppliers 2. Perform surveys of 100% of applicable suppliers 3. Survey response rate: 90%	Promote initiatives to reduce CO_2 emissions in the supply chain 1. Submit requests and support to 100% of 1st tier suppliers that have 2nd tier suppliers 2. Perform surveys of 100% of applicable suppliers 3. Survey response rate: 90%	1. Requests submitted and support provided to 1st tier suppliers that have 2nd tier suppliers: 100% 2. Surveys performed on applicable suppliers: 100% 3. Survey response rate: 100%	○
Operations Management	Controlling chemical substances emission ・Hold emissions of chemical substances below the average for FY2012–2014	Continue efforts	Continued efforts	○
	Social contribution activities Efforts as a good corporate citizen ・Support increases in social contribution activities conducted by employees together with society	Continue efforts	Continued efforts	○
	Cooperating with society ・Support efforts to resolve social and environmental challenges such as biodiversity	Continue efforts	Continued efforts	○

Matters subject to goals management under the Environmental Action Program define the scope of environmental management system (EMS) initiatives.

The Environmental Action Program (Stage 9)

The Environmental Action Program (Stage 9) sets out environmental goals for FY2019 to FY2020. The Shinko Group in Japan established specific targets to achieve in a range of fields during two years. Through our activities to reduce environmental impact thus far, we have carried out initiatives that contribute to achieving the SDGs with the aim of creating a sustainable society. In addition, to engage in activities with an even greater focus on the SDGs, we have established Contributing to the achievement of the SDGs as the objective of our Environmental Action Program (Stage 9).

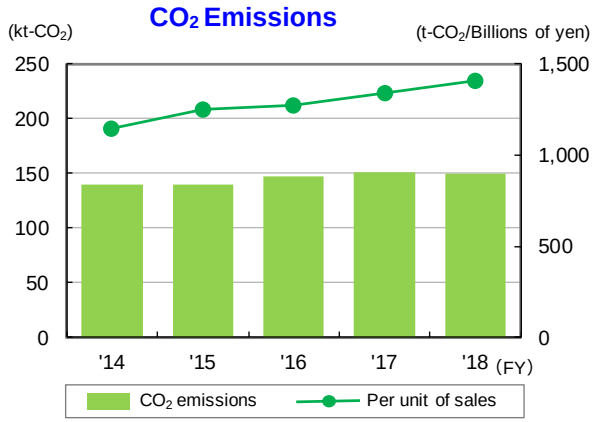
Item	Environmental Action Program (Stage 9) target	FY2019 target
Climate change	Reducing CO_2 emissions from energy consumption ・Hold CO_2 emissions from energy consumption of our facilities to within 162,176 t-CO_2 by the end of FY2020	Hold CO_2 emissions from energy consumption in FY2019 to within 154,924 t-CO_2
Resource circulating	Reducing waste ・Hold generation of waste to within 4,715 tons by the end of FY2020	Hold generation of waste in FY2019 to within 4,676 tons
	Reducing water usage ・Reduce water usage to 1% of that used in FY2017 by the end of FY2020	Implement measures to reduce water usage to 0.5% of that used in FY2017 by the end of FY2019
	Controlling chemical substances emission ・Hold emissions of chemical substances below the average for FY2012–2014	Continue efforts
Supply chain	Promoting green procurement ・Promote upstream initiatives in the supply chain to reduce CO_2 emissions and contribute to the maintenance of water resources 1. Perform surveys of 100% of applicable suppliers 2. Survey response rate: more than 90% 3. Submit requests and support for CO_2 reduction activities to 100% of 1st tier suppliers that have 2nd tier suppliers	Promote upstream initiatives in the supply chain to reduce CO_2 emissions and contribute to the maintenance of water resources 1. Perform surveys of 100% of applicable suppliers 2. Survey response rate: more than 90% 3. Submit requests and support for CO_2 reduction activities to 100% of 1st tier suppliers that have 2nd tier suppliers
SDGs	Contributing to the achievement of the SDGs ・Contribute to the achievement of the SDGs through business activities	Contribute to the achievement of the SDGs through business activities

Matters subject to goals management under the Environmental Action Program define the scope of EMS initiatives.

Global Warming Countermeasures

Results of Activities

In FY2018, CO_2 emissions as a result of energy usage came to 150,072 tons, flat in recent years. In the future, we anticipate an increase in energy usage due to production system enhancements for next-generation flip-chip type packages and equipment investments for next-generation plastic BGA substrates, among other efforts. Based on this situation, we are focusing on energy reduction activities for existing and new equipment.



Resource and Energy-Reduction Projects

In order to curb the amount of energy usage that increases year by year, we launched the Resources and Energy-Reduction Projects in FY2013.We are continuing activities aimed at the challenging goal of cutting energy usage to 61,000 tons of CO_2, which is equivalent to half the amount in FY2012, by FY2020.

In the six years since we began activities, we succeeded in reducing CO_2 by the equivalent of 34,400 tons as the result of a number of initiatives.

To strengthen our activities, we implemented on-site energy-saving review meetings and patrols of manufacturing areas that involve all relevant employees, including the President and officers. We aim to further reduce resources and energy and manufacture better quality products.

<Examples of activities in FY2018>

- Implemented on-site energy-saving review meetings and patrols of manufacturing areas that involve all relevant employees, including the president and officers
- Upgraded utility equipment to highly energy-efficient equipment
- Tighter focus on energy-saving design for new manufacturing equipment
- Reduced air-conditioning load through measures to prevent radiation and insulate heat from heat-radiating equipment (dryers, etc.)

On-site energy-saving review

Here we present a specific activity that is currently under way.

<Upgrading of refrigerating equipment>

Cooling water used on production lines is made using refrigerating equipment. Due to aging of the refrigerating equipment installed at the Takaoka Plant, demand from production lines for cooling water had increased, for that reason the supply situation was tight. By upgrading the refrigerating equipment and revising the plant's supply system, we increased efficiency and stabilized the supply situation to each production line.

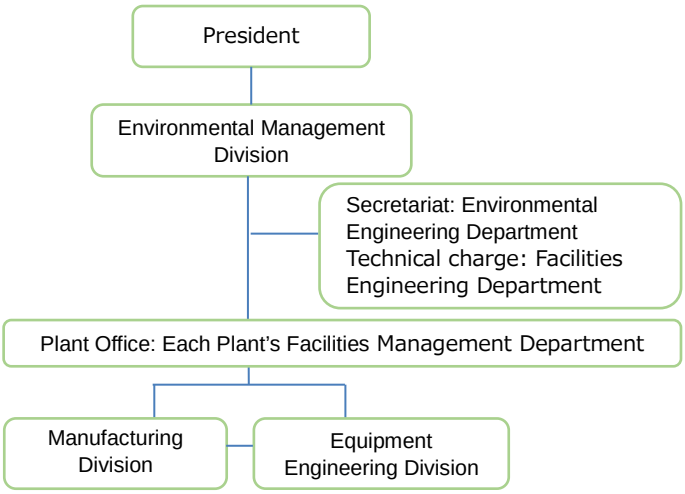
Effect

- Electricity cost: Reduction of 23 million yen/year
- CO_2 emission: Reduction of 720 t-CO_2/year

<Other major measures>

- Efficiency improvement by reconsidering our manufacturing specifications
- Converting manufacturing equipment to use standby modes (operating only when actually processing products)
- Conversion to LED lighting in plants

Resource and Energy-Reduction Projects Structure



Raw Material Reduction Initiatives

Products of the Shinko Group are created with the use of energy and raw materials, and they are shipped in packaging. The energy and materials used up to this point in defective items and debris generated during processing are wasted. We aim to improve yields to reduce this waste as much as possible. In addition, we are working on recycling resources that have been used once, to reduce the input of new resources.

<Examples of reductions in raw materials>

- Improving yields through reductions in debris and lower defect rates
- Using process waste liquids as neutralizing agents for effluent, thus cutting the use of neutralizing chemicals
- Discontinuing use of a cleaning solvent by changing the chemicals applied to components
- Extending the life of jigs and tools and changing their time for replacement
- Recycling indirect materials to reduce the use of new materials

Reducing Water Usage

Results of Activities

We carried out activities with the target of reducing its water usage by 118,000 m^3, an amount equivalent to 5% used in FY2014, during 3 years from FY2016 to FY2018.

In FY2018, we reduced our water usage by 1.33% (31,300 m^3, against the target of 1.3%, 29,900m^3).

In three years, we reduced our water usage by 5.06% (119,000m^3) and achieved our goal. (The Wakaho, Takaoka, and Arai plants were the target.)

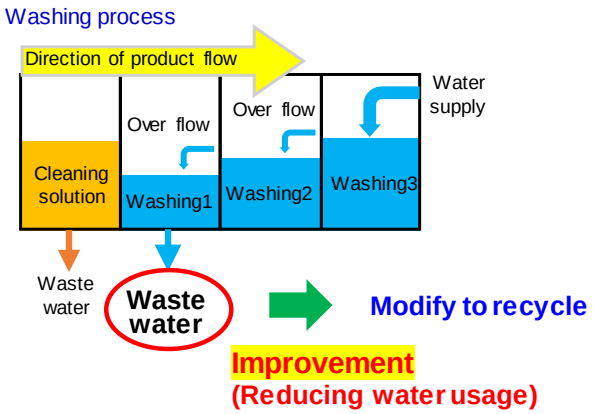
Measures to Reduce Water Usage

In FY2018, we strengthened the recycling of water used in the manufacturing process and the review of water supply for pure water for rinsing products. We also shut down equipment with a low utilization rate by concentrating products onto equipment with a high utilization rate, thereby further reducing water usage.

Here we present a specific activity that is currently under way.

<Reducing water usage in circuit forming processes>

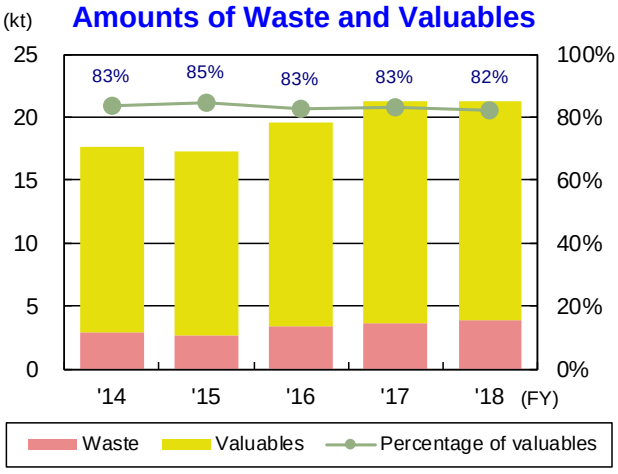
Wastewater from rinsing tanks in product washing process is usually sent to wastewater treatment. The Wakaho Plant investigated the degree of contamination of the wastewater in each rinsing tank, in order to consider water usage reduction in the washing process. The results showed that the wastewater from rinsing tanks for the circuit forming preprocessing process was recyclable with its low level of contamination. Accordingly, the plant connected piping to recover the wastewater and feed it to pure water production equipment for recycling. This reduced water usage by an additional 2,893 m^3/year.



Waste countermeasures

Results of Activities

Gross output in FY2018 (amount of waste + valuable material) was 21,290 tons, of which valuable material was 82%. Gross output and valuable material were both nearly flat, but we anticipate increased waste in the future due to changes in chemicals used and expand production with the shift to next-generation products. Waste plastics are still the main items that end up as waste because they cannot be sold as valuables due to market changes. While this is a difficult situation, we will continue making efforts to reduce the output of waste.



<Examples of waste reduction>

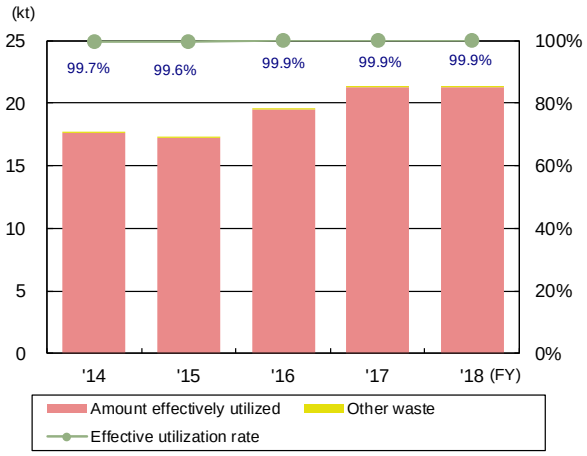
1. Reduction of debris and waste through process improvement
2. Elimination of a cleaning solvent through chemical changes
3. Extending the period of use of cleaning liquid, plating solutions, and recycling waste liquids.
4. Extending the period of use of filters.
5. In-house processing

Effective Utilization of Waste

We achieved zero emissions, eliminating landfill and simple incineration (disposal that does not make effective use of waste heat during incineration or residues left after incineration) of waste in FY2003 and have maintained that status to help create a recycling-oriented society. With this, our rate of effective utilization of waste has remained steady at nearly 100% in recent years.

* The effective utilization rate will not reach 100% since waste for which there is no effective utilization method and waste brought to local government-operated disposal sites that do not practice effective utilization (general waste from business activities) is not subject to zero emissions calculations.

Rate of Effective Utilization of Waste



Proper Disposal of Waste

We consign waste to industrial waste disposal operators for proper disposal in accordance with the Waste Management and Public Cleansing Act and verify proper disposal through annual on-site inspections of disposal operators.

We also properly dispose of equipment containing PCBs possessed by the Shinko Group in Japan in accordance with the Act on Special Measures concerning Promotion of Proper Treatment of PCB Wastes.

Environmental Risk Measures

Preparing for a Large-Scale Blackout

As part of our business continuity planning, in FY2018 we installed an emergency power generator in the Arai Plant in case of a large-scale blackout due to an accident or disaster. This will ensure power to the lights, fire alarm system, and servers during a blackout. The power can also be used for lighting and toilets in an evacuation shelter for persons having trouble getting home.

Emergency power generator

Earthquake Countermeasures

In FY2018, our main activities focused on measures in the Kohoku Plant's employee cafeteria, which can serve as a secondary evacuation center during disasters. We completed seismic strengthening work on the building and ceiling.

Aseismic frame in the ceiling

Cafeteria (Kohoku Plant)

Safety Measures for Chemical Solution and Waste Liquid Equipment

We conduct periodic inspections to avoid leaks of chemical solutions and waste liquids due to aging equipment. We also upgrade old piping, tanks, and other equipment to ensure work safety. In FY2018, we upgraded waste liquid tank equipment at the Kohoku Plant.

Waste liquid tank

Plant Safety Management

Each plant's facilities management department conducts monthly comprehensive safety inspections of each facility to achieve compliance, environmental protection, and the prevention of accidents. We also regularly conduct safety patrols of construction sites.

We also conduct emergency response training and protective equipment training in an effort to reduce environmental risks and ensure safety management.

Emergency response training

Topic

Shinko wins the Environmental Excellence Prize in the Fujitsu Group Environmental Contribution Awards

The Fujitsu Group Environmental Contribution Awards are presented each year to encourage employees to take initiatives related to the environment within the Fujitsu Group.

The presentation ceremony for FY2018 activities was held in June 2019. Our "Reduction of facility costs associated with the wet process," an initiative carried out, won the Environmental Excellence Prize from a pool of 64 entries.

Environmental Excellence Prize

Initiatives at Overseas Plants

At the Shinko Group's overseas plants, we have also rolled out a range of activities suitable for the conditions in each country and region.

KOREA SHINKO MICROELECTRONICS CO., LTD. (KSM)

	FY2018 target	FY2018 results
Energy reduction	Hold CO_2 emissions from energy consumption below 60.7 t-CO_2/billion won per year (emissions per unit of sales)	70.7 t-CO_2/billion won (achievement rate: 83.5%)
	(Working to achieve this target based on the 10% reduction goal in the second five-year energy reduction plan)	
Water usage reduction	Reduce water usage by 2% compared to FY2017 and hold it below 127.4 t/million pieces per month (amount per unit of production)	219.5 t/million pieces (achievement rate: 27.7%)
Waste reduction/ recycling	Reduce generation of waste by 2% compared to FY2017 and hold it below 2.03 t/billion won per year (amount per unit of sales)	1.54 t/billion won (achievement rate: 124.1%)

SHINKO ELECTRONICS (MALAYSIA) SDN. BHD. (SEM)

	FY2018 target	FY2018 results
Energy reduction	Reduce electricity usage for air conditioning by 2% compared to FY2017 and hold below 4,284 MWh/year.	4,352 MWh/year (achievement rate: 98.4%)
	Reduce electricity usage for air compressors by 2% compared to FY2017 and hold below 4,159 MWh/year.	3,761 MWh/year (achievement rate: 109.6%)
	Reduce diesel fuel consumption by 2% compared to FY2017 and hold below 912,000 l/year.	888,000 l/year (achievement rate: 102.6%)
Water usage reduction	Hold water usage below 33.6 ㎥/million pieces per month (amount per unit of production)	24.5 ㎥/million pieces (achievement rate: 127.1%)
Waste reduction/ recycling	Increase recycling rate for packaging materials to 38.8% or higher per month	42.6% (achievement rate: 109.8%)

SHINKO ELECTRIC INDUSTRIES (WUXI) CO., LTD. (SEW)

As SEW is a small company with few employees, it cannot carry out large-scale activities, but it is committed to reducing and recycling waste. SEW trains employees on topics such as environmentally controlled substances and environmental laws as well as conducts emergency response trainings in order to consistently conduct operations that do not impact the environment.