OKI *Open up your dreams*

OKI GROUP ENVIRONMENTAL REPORT

2018

CONTENTS

*In this report, "life-cycle" refers to the sequence of processes corresponding to the "lifetime of a product". The perspective considers the total environmental impact in "design and development → procurement of raw materials and parts → production → transportation → use of product by customers and users → disposal/recycling of used products etc."

The OKI Group aims to conduct environmental management throughout the life-cycle, realizing reductions in environmental impacts through energy conservation, resource circulation, reduction of chemical substances etc., and improvement of corporate value, legal compliance, and economic effects.

<For inquiries>
Oki Electric Industry Co., Ltd.
Global Environment
https://www.oki.com/en/eco/ecoreport/2018/

Editorial Policy

- The OKI Group "Environmental Report" is compiled and published to inform all our stakeholders of the concept, overview, major initiatives and data of the OKI Group environmental management. The report is compiled with particular emphasis on the following:
  - · Integration of "environment" and "management"
  - · Environmental management conducted from a life-cycle perspective
  - · As an initial response to internal and external environmental management inquiries
- Please see our website for detailed information including initiatives not appearing in this report.
  https://www.oki.com/en/eco/

Reference Guidelines

- Sustainability Reporting Guidelines Version 4.0 (GRI)
- Environmental Reporting Guidelines 2012 (Ministry of the Environment)
- Environmental Accounting Guidelines 2005 (Ministry of the Environment)

* GRI(Global Reporting Initiative):
An international NGO that develops and disseminates globally applicable sustainability reporting guidelines.

Time Period

This report covers fiscal 2017 (the year from April 1, 2017, to March 31, 2018). However, the report also discusses some facts preceding this period, as well as policies and plans to be implemented in subsequent periods.

Organization

The report covers the activities of Oki Electric Industry Co., Ltd. (OKI), and its 84 consolidated subsidiaries. However, the environmental accounting on P14 covers OKI's 19 locations in Japan and 7 locations overseas.

Corporate Names / Names of Organizations

In this report, Oki Electric Industry Co., Ltd. itself is referred to as "OKI," and its corporate group, including its subsidiaries and affiliates, as the "OKI Group." The names of the organizations referred to in this report, in principle, are those used as of April 2018.

* The listed corporate names and product names are trademarks or registered trade names.

Forecasts, Plans, and Targets

This report also details forecasts, plans, and targets. They reflect assumptions and judgments based on information available at the time of writing this report. Thus, readers are requested to understand that the future results of the company's activities could be different from what is described in this report.

Reliability of Disclosed Information

Experts within the Group verify the data aggregated from technical knowledge to ensure the accuracy of disclosed information.

Basic Policy for Environmental Management

OKI Group Environmental Vision 2020*

1. Realization of low-carbon societies

Maximize energy consumption efficiency in the business operations, and reduce energy consumption by 8% per nominal sales (corresponds to 12% reduction per real sales) from fiscal 2012. Contribute to the realization of low-carbon societies by continuously providing environmentally friendly products and services.

2. Prevention of pollution

Reduce emission of chemical substances, that can adversely affect people's health and environment, into the atmosphere and water system by 8% per nominal sales (corresponds to 15.5% reduction per real sales) from fiscal 2012.

3. Resource circulation

Increase the amount of recycling ofused products by 25% from fiscal 2012. In addition, minimize the new input resources through expanded recycling of waste materials, reduced input of material during production and promotion of environmentally friendly designs.

4. Biodiversity conservation

Engage in conservation and sustainable use of biodiversity through prevention of global warming, prevention of air and water pollution caused by chemical substances, expansion of recycling processes and minimization of new input resources.

*The OKI Group is considering reviewing the vision so that the activities characteristics etc. can be more accurately reflected.

OKI Group Environmental Policy

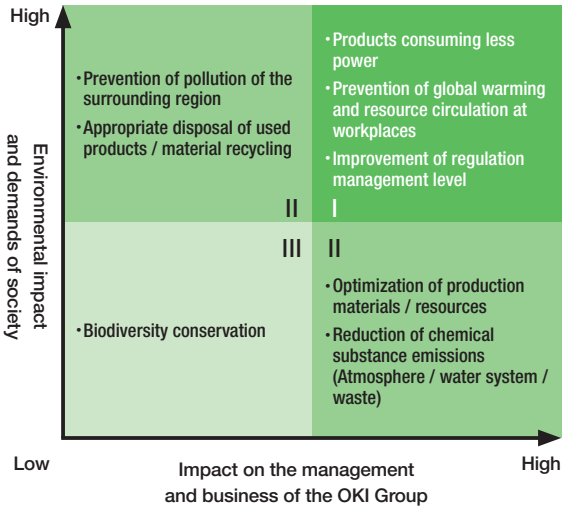
The OKI Group realizes a better global environment by providing products and services that contribute to the development of the information society for the next generation, and passes this down within the group.

1. **Work to prevent pollution and protect the environment by implementing the OKI Group environmental management.**
   - Take action to provide environment-friendly products and services in all business processes through product planning, manufacturing, and maintenance operations.
   - In business activities, strive to save energy and resources and take action to reduce and recycle waste.
   - Work on biodiversity conservation and sustainable use.
2. **Comply with applicable environmental legal requirements and regulations, and with customer requirements and other requirements to which the OKI Group subscribes.**
3. **Adequately implement PDmCA (Plan-Do-multiple Check-Act) in the environmental management system, and take action to advance environmental performance and to continue improvement of its operation system.**
4. **Disclose environmental information, and make wide contributions to the society by supporting environmental activities.**

President
Oki Electric Industry Co., Ltd.

Policy—Vision—Activity Plan Relationship

The OKI Group has formulated the OKI Group Environmental Policy in consideration of environmental impacts and demands of society and impacts on management and business. The “Environmental Vision 2020” comprises four themes and is established as the mid- to long-term target of the Policy. We have planned and are implementing specific activities with respect to “Realization of low-carbon societies”, “Prevention of pollution”, “Resource circulation” and “Biodiversity conservation”, which have a particularly close relation to our core business.



Integration of “Environment” and “Management”

Linking Day-to-day Improvements to Reduction of Environmental Impact

Environmental Impact Reduction from a Lifecycle Perspective and Benefits for Business

The OKI Group promotes environmental management across the supply chain in Japan and overseas, and works to realize both the reduction of environmental impacts at each stage of the lifecycle and benefits for business.

For example, improvement of production efficiency leads to energy-saving/resource conservation from the viewpoint of reduction of environmental impact and directly links to the reduction of production cost from the perspective of benefits for business. Also, at the stage of product usage by the customer, we pay attention to product characteristics and broadly classify products into those that cycle between standby and startup, such as ATMs and printers, and those that operate continually such as communication equipment. We then promote energy conservation measures accordingly to contribute to the streamlining of customer energy consumption.

The OKI Group is promoting activities to reduce environmental impacts from a life-cycle perspective as activities closely related to the improvement of the daily workplace and business management.

	Reducing Environmental Impact	Benefits for Business
Procurement	• Optimization of procurement volumes → Energy-saving / prevention of chemical pollution • Procurement of components that do not contain hazardous substances → Prevention of pollution / legal compliance	• Reduction of procurement costs and inventory • Prevention of loss of sales opportunities and business continuity by legal compliance
Production	• Improvement of production efficiency → Energy-saving / resource conservation • Reduction of chemical substance emissions → Prevention of pollution / legal compliance	• Reduction of production costs • Shortened the production lead-time • Business continuity through legal compliance
Transportation	• Improvement of transportation efficiency → Prevention of global warming / resource depletion • Reduction of packaging materials → Resource cycling / reduction of waste	• Reduction of transportation costs • Enhanced response to customer delivery dates • Improved efficiency of delivery / installation work
Product Use	• Power-saving / reduced size and weight of products → Prevention of global warming / resource depletion • Reduction of chemical substance content in products → Prevention of pollution	• Improvement of customer satisfaction by streamlining of customer energy consumption / supporting customer compliance with the act on rationalizing energy use / reducing the size and weight of products
Disposal	• Recycling of used products → Improvement of recycling rate / reduction of final disposal volume / prevention of pollution by substances contained	• Elimination of third-party products through collection of end-of-life products / improvement of corporate value by improved regulatory compliance

Cross-sectional Environmental Management Activities Based on Site Characteristics

Promotion of Activities from Comprehensive and Individual Perspectives

Regulatory Compliance, Standardization and Sharing Case Studies through the Committee on Global Warming Prevention Promotion

The OKI Group has established the Committee on Global Warming Prevention Promotion, which includes affiliated companies, to effectively promote energy conservation activities throughout the entire Group. This committee bases its activities on three pillars: regulatory compliance, standardization and sharing case studies.

1. **"Improvement of regulatory compliance with the Act on the Rational Use of Energy"** In order to ensure the regulatory compliance of the Group as a whole, we work together to mutually confirm the compliance status of each company.
2. **"Standardization of operating procedures"** We standardize operations common to each company across the Group, such as procedures for the management and monitoring of energy conservation activities.
3. **"Sharing and developing improvement case studies"** In accordance with the characteristics of each site given below such as plants, offices, etc., we develop effective measures and case studies to improve the efficiency of energy conservation activities. Case studies are disclosed on our intranet etc. to facilitate smooth sharing.

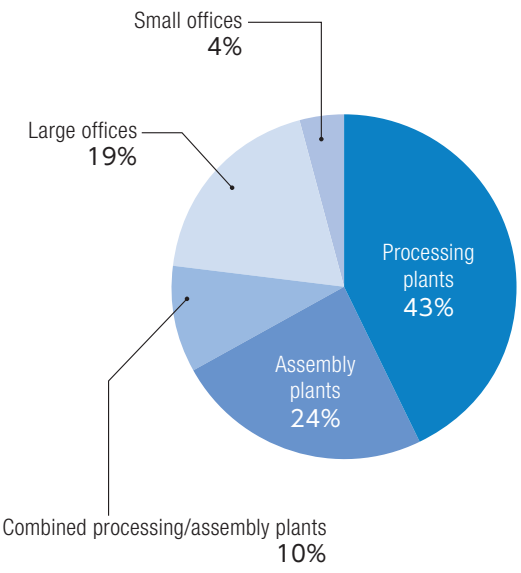
Environmental Measures According to Site Characteristics

With regards to our global warming prevention activities at each site, we classify our workplaces as coating, plating and other processing plants; assembly plants for products such as component mounting; and large and small offices, and promote measures according to the respective characteristics of these.

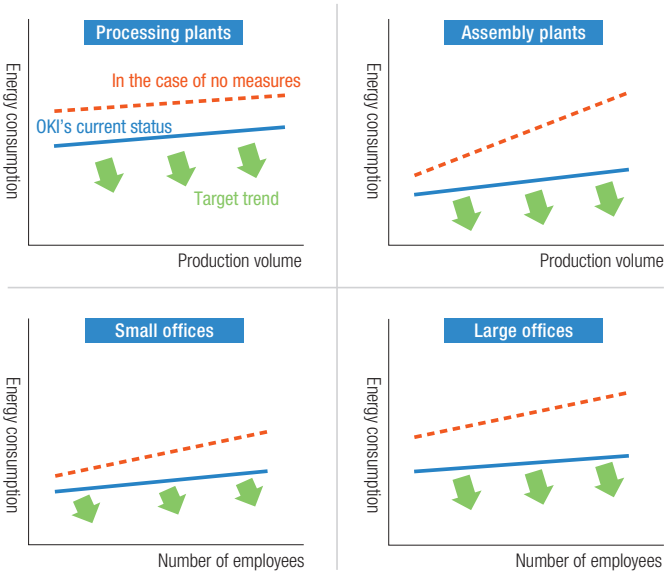
As an example, processing plants are characterized by continuous operation of production facilities and air conditioning equipment. For these, we are primarily working to achieve a fixed reduction in energy consumption. The assembly plant has the characteristic of a low fixed load and energy consumption that fluctuate according to production volume. Based on the fact that high-mix low-volume production is increasing, efficiency is being promoted through measures such as cell production, unit production, and change in layout. In our large offices, we are promoting improvements through the introduction of energy-efficient air conditioning equipment and lighting fixtures, and in smaller offices, we are making improvements centered on energy conservation activities and other operational aspects.

The OKI Group aims for optimization across the entire Group by implementing such measures and setting targets according to site characteristics, conducting trials for common issues, and horizontally developing effective cases to other sites.

■ Percentage of energy usage in the OKI Group by site characteristic



■ Characteristics of sites in terms of the relationship between energy consumption, production volume and number of employees



Resource Conservation Activities Proceeding at Overseas Plants

The OKI Group is promoting resource conservation activities such as streamlining of resource input by reviewing packaging materials and improving productivity. Here, we introduce examples of such activities at plants in China and Thailand.

Collaboration with Suppliers - Cardboard Usage Halved

Environmental policies have been strengthened in China, and the suspension of the import of resources including waste paper was announced as part of this move in 2017. With the strengthening of such regulations, it is said that the price of cardboard will sharply increase by 1.5 times or more, leading to an increase in the cost of parts packed in cardboard.

In cooperation with suppliers, OKI Electric Industry (Shenzhen) (OSZ), which manufactures ATMs etc. for the OKI Group in Shenzhen, China, changed the cardboard packaging of procured parts to plastic returnable boxes, thereby avoiding an increase in the cost of parts and greatly reducing the amount of cardboard used.

OSZ surveyed the packing of all 8,000+ kinds of parts related to ATM manufacturing and selected 3,856 varieties, which corresponds to about half. We visited over 20 suppliers who supply each and every one of these, held repeated discussions, and decided in detail the packing specifications of returnable containers instead of cardboard packaging and rules for returning them while maintaining quality.It was possible for suppliers to ship boxes with the parts arranged in such a way that OSZ could use them immediately on the assembly line, thereby eliminating work on the OSZ side.

As a result, we succeeded in halving the amount of cardboard used per day. We reduced work costs associated with unpacking/dismantling/disposal of cardboard, equivalent to 6% of parts management work costs, and promoted a reduction of environmental impact and costs.

Inspecting a sample returnable box for each one of the 3,856 kinds of parts.

In the plant where cardboard was reduced.

Streamlining of Resource Input by 60% - Creation of “Katsu Space”

OKI Data Manufacturing (Thailand) (ODMT), which carries out the final assembly of printers in Ayutthaya, Thailand, actively involves local Thai employees in promoting conservation of resources by improving productivity under the slogan “Kaizen” (improvement). In order to respond flexibly to the diversification of production items, the company is working to improve work efficiency, such as by eliminating waste, training multiskilled workers and the company development of “autonomation” equipment, and are rigorously reducing the volume of resource input such as by keeping just a single day’s inventory of parts.

To further prevent the occurrence of defective products that greatly influences resource input, we introduced a real-time defect reporting system in 2017. In the event of a defect, the process, parts, cause, etc. are shared in real time, and related departments respond promptly to suppress the increase of defective products and thoroughly utilize resources with efficiency.

The accumulated effect of these efforts has improved resource input efficiency per unit production value by 57% compared to five years ago. These achievements led to the creation activity of “active space” called “Katsu space”, and in fiscal 2017 alone succeeded in generating 2,375 m^2 of space - 8% of the total plant floor. We respond to the production of new items without resorting to the expansion of buildings, which can lead to significant increases in consumption of resources and energy and additional costs.

Screens of the real-time defect reporting system. When a defect occurs, the process, parts, cause, response situation etc. are displayed.

Effective space created by the “Katsu space” activity. In fiscal 2017 alone, this approached 10% of the entire plant.

Activities to Prevent Global Warming According to Site Characteristics

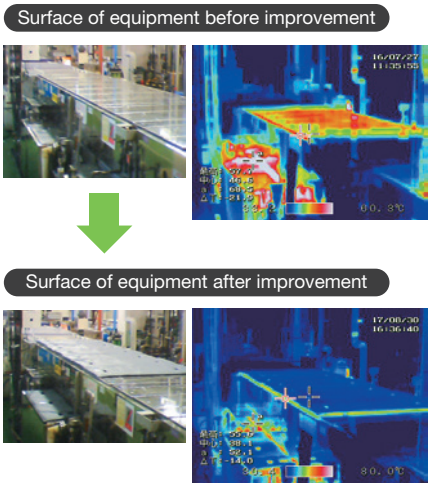
The OKI Group is promoting energy conservation measures according to the characteristics of the site. Here, we introduce examples of a processing plant that manufactures printed circuit boards and an assembly plant that mounts electronic parts on them.

90% Energy Savings in Continuously Operating Equipment

OKI Circuit Technology (OTC), which manufactures high-reliability printed circuit boards etc. used in space, is promoting the reduction of fixed energy consumption in production facilities that operate non-stop.

One of these, the desmear processor, is equipment that melts and removes the shavings (smear) remaining on the drilled surface of the board, and constantly consumes electric power. Since a large amount of heat is emitted by the equipment when maintaining the interior at a high temperature for the melt treatment, gas was necessary for supplying steam for heating and maintaining the inside temperature of the equipment, and electric power was required to cool the room and prevent the temperature from rising around the equipment, which was a problem in terms of energy conservation.

As a countermeasure, we succeeded in suppressing the external heat release and reducing the surface temperature from 75°C to 28°C by covering the surface of the equipment with a heat insulating material. In order for it to be able to withstand the heat of the equipment, we selected a heat insulating material made of fluororesin and glass fiber. Thanks to these measures, we reduced the energy by an equivalent of 94% of the conventional equipment alone and succeeded in reducing costs.



By using insulation, the surface temperature was decreased from 75°C to 28°C while the internal temperature of the equipment was maintained.

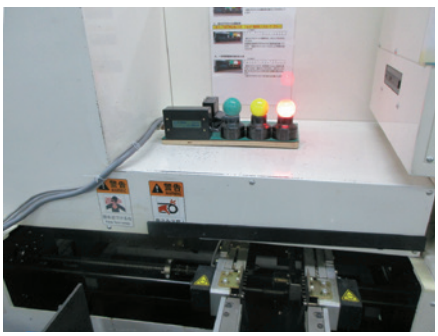
Visualization of Operational Status - 90% Energy Savings by Mode Switching

Nagano OKI, which mounts electronic components on printed circuit boards, succeeded in considerable energy savings by coupling the operation mode to the operation status of equipment.

In the process of mounting electronic components, the bond is used to temporarily fix large parts before soldering and a hardening furnace to harden the bond by heating.

At Nagano OKI, it was impossible to lower the amount of energy used in the hardening furnace, despite a decrease in the amount of bond used due to the downsizing of parts and progression of mounting technology, which was a challenge. The reason for this was that the hardening furnace was often left in high-temperature operation mode because its operation status was not known by operators or managers.

As a countermeasure, the state of the hardening furnace was monitored by a sensor and the operator was notified by the color of a lamp on the equipment when a certain non-operation time had passed, thereby prompting the operator to switch the hibernation mode. For the case the operator does not notice the notification, we created a mechanism that allows the manager to instruct the operator in response to an automatic notification sent wirelessly to the manager's PC.



The operator was notified operation status of the equipment by the color of a lamp. The status is also displayed on the manager's PC monitor via the wireless. 90% energy conservation is promoted by visualization.

As a result, the previously fixed energy consumption of the bond hardening furnace became a lean consumption that responds to fluctuations in production volume, achieving a 90% energy saving for the hardening furnace alone.

Reduction of Chemical Substance Emissions

The OKI Group is working to reduce emissions of harmful chemical substances. Here, we introduce examples of promoting the reduction of chemical substances by reviewing manufacturing methods and substituting chemical substances used in processes, etc.

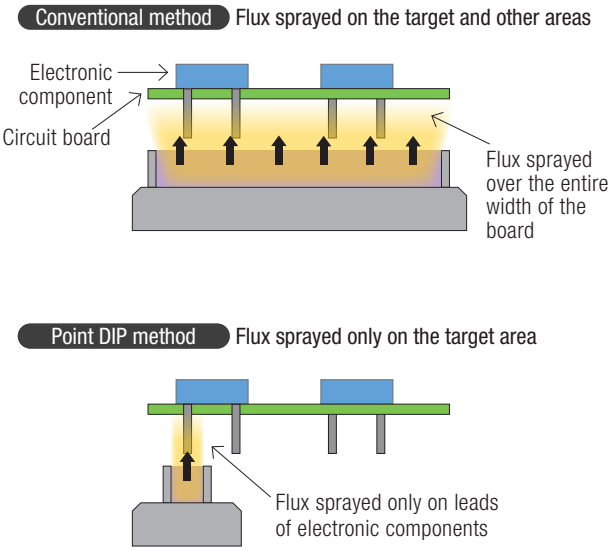
Reduction of Chemical Substances by Innovation of Manufacturing Method

In 2015, Nagano OKI introduced a point-dip (DIP) apparatus that scales-down the conventional method of immersing a substrate in a solder bath to pinpoint soldering for some of the processes to solder electronic components to circuit boards. In 2017, we increased the number of units and increased the rate of operation from 57% to 70%.

Flux is sprayed on the part to be soldered for pre-cleaning and prevention of oxidation. Isopropyl alcohol (IPA) is the main component of the flux. While IPA is relatively inexpensive and has high detergency, etc. it is highly toxic and is regulated by laws and regulations, so reduction of its use was an issue.

Since the point DIP apparatus conducts pinpoint soldering, it has the great benefit of reducing the usage of chemical substances contained in the flux such as IPA by 70%.

Nagano OKI jointly develops proprietary control software with equipment manufacturers so that soldering work on boards can be conducted in parallel while other circuit boards are being detached from the equipment to improve the operation rate of point DIP equipment. In addition to improving the operation rate, we also increased the number of units, and actively promoted cost reductions and reduction of environmental impact.



By pinpoint spraying the flux, the amount of chemical substances used is reduced by 70%.

Reduction of Harmful Chemical Substance Emissions

At ICT Systems NUMAZU Plant, the manufacturing process for products to be used underwater involves work to fix parts with adhesive. Conventionally, the adhesive contained dichloromethane, which has a high environmental impact and strong toxicity, so measures were taken such as using local exhaust equipment to prevent workers from inhaling the steam. As the amount used at the plant already exceeded 200 kg per year and is expected to increase significantly as production increases, we have decided to switch to dichloromethane-free adhesives.

In replacing the adhesive, it was expected that the reliability test would be prolonged due to the strength required for underwater use and the long service life, but the design, manufacturing and quality divisions closely cooperated to review the items and objectives of the test, and were thereby able to significantly accelerate evaluation and application to the product.

Dichloromethane has been completely abolished at this plant and we are also promoting the reduction of hazardous chemical substances in other products.

ICT Systems NUMAZU Plant
Manufactures various products required to have "high reliability", from large system products for government agencies to small-sized mounting boards for the private sector.

Contributing to Energy-savings for Customers through Environment-friendly Design

The products of the OKI Group are developed from a life-cycle perspective. Here we introduce the case study of an ATM for the overseas market. We promoted the reduction of power consumption during product use and the reduction of the environmental burden during transportation.

ATM: 1.5 Times the Processing Speed, Half the Power Consumption during Standby

OKI released the "ATM-Recycler G8", a new cash recycling ATM for the overseas market in May 2017. In emerging markets, the amount of cash in circulation is extremely large, and counter services in financial institutions need to be streamlined. There is a particularly strong need for automation of cash deposits by individuals and corporate customers. The cash recycling ATM enables efficient operation by reducing the frequency of replenishment and collection by recycling deposited banknotes. As such, it is becoming an indispensable part of the social infrastructure.

Repeated technological improvements for improved energy-saving performance

In response to these needs, we increased processing speed by 1.5 times compared with the existing model, while reducing power consumption by up to 50% when there are few customers and the ATM is in standby mode. When the standby power consumption is estimated for a 24-hour period, this equates to a reduction of approximately 1,300 kWh electricity consumption and approximately 600 kg CO_2 emissions per ATM annually.

In order to improve energy-saving performance, we have promoted the new development of a high-efficiency power supply unit, adoption of LEDs for the display section backlight, integration of inter-module control sections, and improvement of motor control methods etc.

Equipment mass reduced by 20% — energy-savings in the transportation process

In addition, we reduced the equipment mass from approximately 500 kg to around 400 kg by reducing the number of parts and changing the materials. This is leading to reductions in energy consumption in the manufacturing process and fuel consumption in the transportation process.

For details, see https://www.oki.com/en/press/2017/05/z17009e.html

"ATM-Recycler G8"
Power savings of up to 50% in standby mode by the new development of a high-efficiency power supply unit etc.

–TOPIC– Recovery of Used Wire Electrodes

OKI Electric Cable runs a collection service for used wire electrodes and bobbins around which the electric wires are wound. This contributes to reduced running costs as well as reduces environmental burden through effective use of resources. For example, OKI Electric Cable offers a price reduction equivalent to 20 kg of new wire for every 70 kg of used wire collected. OKI Electric Cable pays the cost of the shipping and collection bags, etc. thereby promoting the collection service.

Adaption to Climate Change

The OKI Group is also developing products that contribute to adaptation to climate change. Here we introduce devices that monitor river water level fluctuations caused by abnormal weather and so on.

Realization of Zero Energy and Wireless Water-level Monitoring for Rivers

Due to the impact of increasingly abnormal weather in recent years, the possibility of severe disasters occurring that exceed conventional assumptions is increasing. In particular, flood damage in urban areas due to increased flow in small and medium-sized rivers with low water level gauge installation rates is increasing.

The network type “zero energy ultrasonic water-level gauge”. Wiring construction work is unnecessary due to the adoption of a wireless system and solar cell.

Outside use of high precision water-level gauges

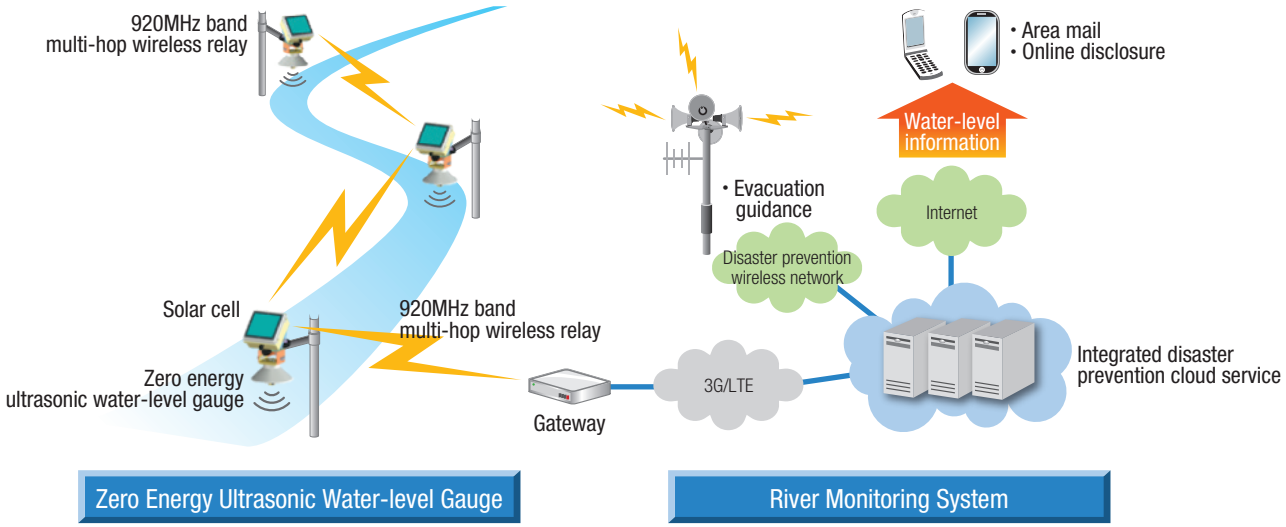
Focusing on such social issues, OKI and Shizuoka OKI have developed a compact, lightweight and integrated “zero energy ultrasonic water-level gauge” (hereinafter zero energy water-level gauge) as a sensor capable of easy installation and information gathering at low cost. The “zero energy water-level gauge” is based on a highly accurate “ultrasonic water-level gauge” that has numerous achievements in river monitoring and combines a wireless device and solar cells to eliminate the need for network connection and power supply construction work.

OKI has linked Shizuoka OKI’s “zero energy water-level gauge” and the “IoT-GW*”, which is equipped with OKI’s “SmartHop® SR wireless module”, and is commercializing the “river monitoring system” , which makes it possible to grasp the water level situation at multiple locations - from point monitoring to area monitoring. OKI is actively marketing this to local governments considering collection and disclosure of water level information and is investigating deployment of cloud services.

Equipment power-saving function necessary for outdoor installation

The “SmartHop SR wireless module” in the wireless section has good reception characteristics given by 920MHz multi-hop wireless and is equipped with power saving functions facilitated by advanced control technology. This made it possible to create wide-range and flexible wireless networks with cordless power supplied by solar cells, and realized the “zero energy water-level gauge”, which is easy to install outdoors.

* IoT-GW: apparatus that connects an IoT device to a cloud server via the Internet for communication

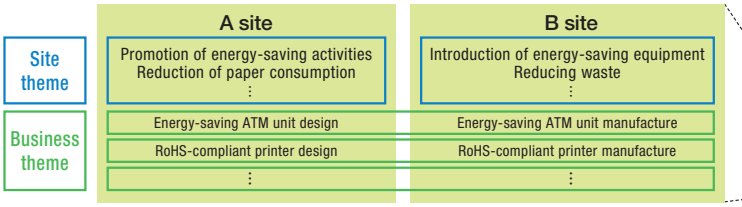


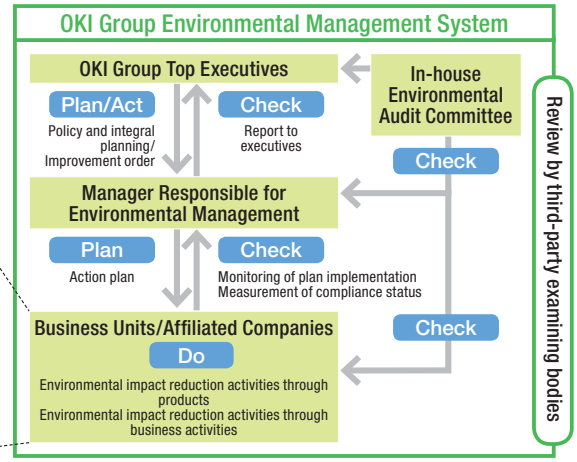
Detailed Data

The OKI Group completed the group consolidation of ISO14001 certification in fiscal 2004 from the perspective of the total optimization and the maintenance and improvement of governance of the Group. In fiscal 2017 we completed the transition to ISO14001:2015. We are robustly implementing the PDCA cycle to share and adjust targets, measures and information on the latest legal revisions and the like within the Group.

Environmental Management-related Information

The OKI Group environmental management system has built structures for themes relating to workplace (site themes) and themes relating to product development and business (business themes) and promotes a PDCA cycle. We efficiently promote the environmental management of the whole Group on two main themes.





Fiscal 2017 Activity Results

Category	Activity Content	Targets→Outcome	Details
Realization of a low-carbon society			
Products	Development of energy-saving products	20% or more of developed products → 67% (energy saving of 21% or more over conventional products)	P4,7,9
Business activities	Energy-savings at workplaces (plants and offices)	Improvement of 15.4% or more → 19.1% improvement (consumption vs. FY2012*1)	P4,5,7
Prevention of pollution			
Products	Development of products complying with regulations on chemical substances in products	50 or more products → 56 products	P4
	Ensuring legal compliance by supporting the new standard survey form (chemical substance management system/management procedure manual)	Respond to addition of RoHS prohibited substances → Response function added to IT system Confirm status of compliance with laws and regulations → No legal violations	P4
Business activities	Reduction of chemical substance emissions from plants (atmosphere/water/soil)	Improvement of 27% or more → 38% improvement (chemical substance emission rate vs. FY2012*2)	P4,8
	Compliance with chemical substance related regulations (atmosphere/water/soil)	Zero legal violations → achieved	P4,8
Resource circulation			
Products	Recycling of used products	4,000 t or more → 2,470 t	P4,12,13
	Development of easily recyclable products	30 or more products → 40 products	P4
Business activities	Reduction and appropriate disposal of waste/recycling rate	Recycling rate 82% or more → 86%	P4,12,13
	Streamlining of resource input	Improvement of 66% or more → 64% improvement (resource input rate vs. FY2012*3)	P4,12,13
Common			
Biodiversity conservation	Realization of low-carbon societies/prevention of pollution/ resource circulation	Promotion of the above initiatives	Website*4

In order to accurately reflect the results of the activities, management indicators were reviewed from FY2017 as shown in *1 - 3 below.
*1 Total of "improvement in energy usage rate × usage rate for entire group" for each workplace *2 "Emissions/input" of chemical substances
*3 "Disposal amount/input" of primary resource *4 Efforts for conserving biodiversity https://www.oki.com/en/eco/management/biodiversity.html

External Awards

FY2017 Kanto Bureau of Economy, Trade and Industry "Director's award for excellent energy management plant"
Recipients: OKI System Center, OKI Proserve - Recognition of energy conservation/innovation of equipment by optimizing the operation of heat source equipment etc.

FY2017 Industrial Estate Authority of Thailand "Excellent environmental management plant award"
Recipient: OKI Precision (Thailand) - Recognition of nine were recognized, including wastewater treatment and water saving activities, industrial waste disposal, exhaust management, VOC management, etc.

Responses to Environmental Pollution, etc.

Pollution of groundwater and soil
The OKI Group installed observation wells at business locations, and is monitoring groundwater. Also, the results of a past survey found environmental pollution in the soil and groundwater at several business locations. This finding was reported to the government, and appropriate measures are currently being taken to prevent the contaminated soil and water from spreading into other areas and groundwater.

Subsequent and extraordinary events
There were no extraordinary events during the period of this report and no serious subsequent events after the period of this report.

Detailed Data

Overview of Environmental Impact through Business Activities

Material Balance

The material balance from the perspective of life-cycle is presented as an overview of the environmental impact of the OKI Group.

INPUT	Fiscal 2017	Source	OUTPUT	Fiscal 2017
Energy			**Greenhouse Gases**	
Electricity	1.52 (100 million kWh)	Business Activities (Development / Production, etc.)	Greenhouse gases due to business activities	8.54 (10,000t-CO_2)
Heavy oil	655 (kℓ)		CO_2	8.07 (10,000t-CO_2)
Gasoline	0.741 (kℓ)		Other greenhouse gases (PFC, etc.)	0.47 (10,000t-CO_2)
Kerosene	39.8 (kℓ)		**Smoke and Soot**	
Light oil	69.5 (kℓ)		NOx	3.65 (t)
City gas	1,840 (km^3)		SOx	3.53 (t)
LPG/LNG	141 (t)		**Chemical Substances**	
Crude oil equivalent total*1	42,500 (kℓ)		PRTR (emitted)	14.4 (t)
Water			PRTR (transferred)	39.5 (t)
Waterworks / industrial water	76.5 (10,000 t)		**Waste**	
Groundwater / well water	68.9 (10,000 t)		PRTR (emitted)	16,700 (t)
Chemical Substances			Recycled	14,300 (t)
Substance subject to PRTR*2	526 (t)		Final disposal	453 (t)
Energy		Transportation	**Atmosphere**	
Fuel (light oil, etc.)	173,000 (GJ)		CO_2	1.18 (10,000t-CO_2)
			NOx	380 (t)
			SOx	0.138 (t)
Energy		Use by Customers	**Atmosphere**	
Electricity	18.3 (100 million kWh)		CO_2	85.1 (10,000t-CO_2)
Used Product Reclamation		Disposal	**Used Product Recycling**	
Amount handled	2,470 (t)		Material recycling rate	99.3 (%)

*1 Changes in energy consumption (converted into crude oil) appear on our website. https://www.oki.com/en/eco/business/greenhouse_gas.html
*2 Details on substance covered by PRTR (a notification system for chemical substance emissions appear on our website. https://www.oki.com/en/eco/business/chemical.html
*Initiatives to reduce environmental impact in each process are outlined on P6-10 of this report.

SCOPE3

CO_2 emissions for fiscal 2017 for the entire supply chain of the OKI Group in Japan and overseas are as follows.

SCOPE 1 Emissions directly resulting from the use of fuel and manufacturing processes at OKI	Emissions: 15,300t Ratio: 0.846%	**SCOPE 2** Indirect emissions consequent on the use of electricity and heat purchased by OKI	Emissions: 71,900t Ratio: 3.97%	**SCOPE 3** Indirect emissions in the value chain	Emissions: 1,720,000t Ratio: 95.2%

CO_2 emissions by SCOPE 3

Category		Emissions in FY2017 10,000 t CO_2	Emissions in FY2017 Ratio (%)	Method of Calculation
SCOPE 3, Upstream				
1	Purchased goods and services	60.0	34.8	Money values for goods and services purchased or acquired by the Group × Emissions unit value by item
2	Capital goods	4.01	2.33	Monetary values of investment for capital goods the Group purchased × Emissions unit value by them
3	Fuel and energy related activities not included by SCOPE 1 or 2	0.587	0.34	Amounts of usage of electricity, steam, cold water, and hot water × Emissions unit value
4	Transportation and delivery (upstream)	0.512	0.300	Ton-kilometers transported × Unit value by means of transport + Transport costs × Unit value by means of transport
5	Waste generated in operations	0.315	0.183	Amounts of processed/recycled wasted × Emissions unit value
6	Business travel	0.247	0.143	Number of employees × Emissions unit value
7	Employees commuting	0.859	0.500	Number of employees × Working Days × Emissions unit value by Working arrangements and Urban classification
8	Leased assets (upstream)	1.06	0.613	Power consumption of the Data center we rent × Emissions unit value of Power company
SCOPE 3, Downstream				
9	Transportation and delivery (downstream)	-	-	Not covered.
10	Processing of sold products	19.5	11.3	Sales turnover of intermediate products × Emissions unit value
11	Use of sold products	85.1	49.4	Hypothetical durable years of products × Annual power consumption × Number of sales × Emissions unit value
12	End-of-life treatment of sold products	0.0384	0.223	Amounts of processed/recycled waste, by types of waste and processing method × Emissions unit value
13	Leased assets (downstream)	-	-	Not covered. (The Group's business is not applicable.)
14	Franchises	-	-	Not covered. (The Group's business is not applicable.)
15	Investments	-	-	Not covered. (The Group's business is not applicable.)
Total		172	100	

Detailed Data

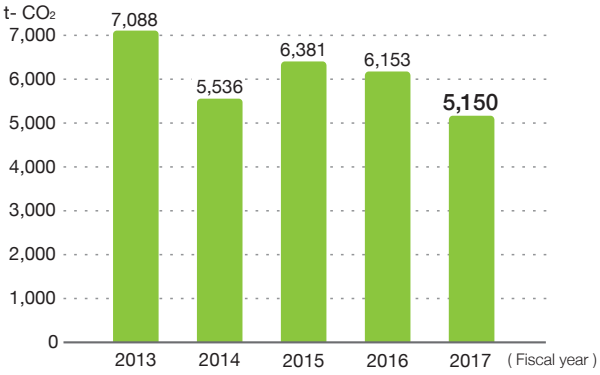
Reducing Environmental Impact of Business Activities and Products

Reducing Environmental Impact of Physical Distribution

OKI Proserve, a company in charge of OKI's logistics operations, has promoted a modal shift since a very early stage in order to reduce CO_2 emissions during transportation, while creating a data base of transportation information to aggregate the data required by the Energy Saving Law. In fiscal 2017, it achieved a reduction of 520t-CO_2 emissions through the modal shift. CO_2 emissions from all transportation activities were 5,150t-CO_2.

Modal shift efforts:
https://www.oki.com/en/eco/business/greenhouse_gas.html

■ CO_2 Emissions from Transport Activities

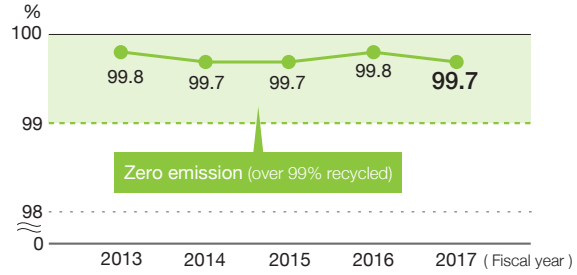


Promotion of Material Recycling (Zero Emissions)

The OKI Group appropriately recycles its waste generated at production sites and other locations, and has been active in improving our material recycling rate*1. In 2002, we achieved "Zero Emissions*2" at our major production sites, and have been continuing our efforts since then. In fiscal 2017, the material recycling rate was 99.7%.

*1 Material recycling rate: (quantity of material-recycled resources) / (quantity of material recycled resources + quantity of waste subject to final disposal) × 100
*2 Zero Emissions:defined by the OKI Group as a material recycling rate of 99% or more

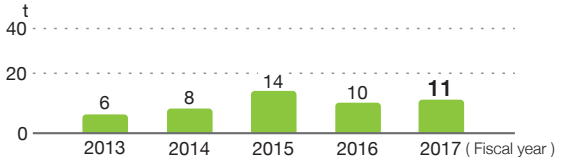
■ Material Recycling Rates of Main Production Sites



Amount of Waste Subject to Final Disposal

The amount of the general and industrial wastes emitted from the OKI Group's major production sites and subject to final disposal was 11 t in fiscal 2017.

■ Amount of Waste Subject to Final Disposal Emitted from Main Production Sites

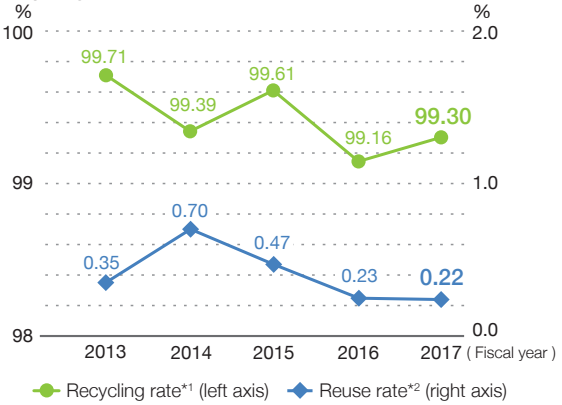


Recycling of Used Products

OKI, OKI Data, and OKI Customer Adtech actively utilize the Crossjurisdictional Waste Treatment Manufacturer Scheme, which was granted by the Ministry of the Environment in June 2006, to promote the recycling of used products. The recycling rate reached 99.30% and the reused rate reached 0.22% in fiscal 2017.

Figures on other resources are listed on our website.
https://www.oki.com/en/eco/business/recycle.html

■ Recycling of Used Products



*1 Recycling rate: the ratio of material recycling and reuse to the collected used products (in mass)
*2 Reuse rate : the ratio of reused parts and materials to the collected used products (in mass)

Detailed Data

Environmental Accounting

Environmental Conservation Costs

When the OKI Group makes capital investments to renew or introduce infrastructure, it selects equipment with low environmental impact. Capital investment in fiscal 2017 amounted to 293 million yen while the amount of costs was 816 million yen.

■ Investment / Costs

(Unit: million yen)

Category		Main Efforts	Investment	Costs
Cost in business areas	Prevention of pollution cost	Investment in pollution control facilities, and maintenance and operation costs	25	102
	Global environmental conservation cost	Investment in energy-saving facilities, and maintenance and operation costs	121	90
	Resource recycling cost	Investment in facilities for internal treatment of organic waste liquid, waste recycling costs	32	360
		Total	178	553
Upstream / downstream cost		Investment on manufacturing facilities and maintenance costs	2	82
Administration cost		Costs for obtaining environment management certifications, and maintenance and operation costs	113	174
R&D cost		R&D costs for creating energy-saving products	1	5
Social activity cost		Costs for planting trees in production sites, costs for activities contributing to local communities	0	2
Environmental damage cost		Costs for reserves to respond to environmental damages, insurance costs and surcharges	0	1
Other costs		—	0	0
Total			293	816

Benefits of Environmental Conservation

Economic effects marked 471 million yen, owing to the sales of waste as valuables. CO_2 emissions were reduced 5,170 tons from the previous fiscal year.

■ Economic Effects

(Unit: million yen)

Category		Main Efforts	Effect
Cost reduction effect	Total effect of saving energy and resources	Reduction of electricity, petroleum, gas, and water used in business activities	64
	Effect of reducing treatment cost	Reduction of waste generated from business activities through recycling	83
Real income effect		Sale of valuable waste generated from business activities	324
Total			471

■ Environmental Conservation

(Unit: t)

Environmental Impact Indices	Emissions Reduction On Previous Year
Greenhouse gas emissions through business activities	5,170
Amount of waste subject to final disposal	57.5

<Accounting conditions> ① When environmental conservation costs and other costs are used for a single activity, only the environmental costs are calculated for environmental accounting.
② Personnel costs are calculated by prorating the personnel costs for the total time spent on environmental conservation activities.
③ The real income effect represents the value for the current fiscal year.

Major Environmental Conservation Efforts

The following tables show the main efforts with respect to investment, costs and economic effects that are calculated in our environmental accounting.

■ Main Efforts by OKI Group in Japan

(Unit : 1,000 yen)

Category	Main efforts	Amount	Site
Investment	Renewal of energy-saving air conditioners	44,840	Shibaura district
	Renewal of switch room converter equipment	14,825	Honjo district
	Renewal of facility monitoring equipment	8,300	OKI Data/LED Management Factory
	Renewal of energy-saving air conditioners	7,220	Takasaki district
	Conversion of lighting to LEDs	7,000	Tomioka district
Costs	Waste disposal outsourcing costs	56,166	OKI Printed Circuit Joetsu Factory
	Monitoring the operation of electric/boiler facilities	47,000	Takasaki district
	Wastewater chemicals	33,250	OKI Printed Circuit Joetsu Factory
	Waste disposal outsourcing costs	27,992	OKI Printed Circuit Ome Factory
	Fixtures, fittings and other waste disposal costs	23,959	Hokkaido regional office
Economic Effects	Cost of selling waste as valuables	105,993	OKI Printed Circuit Joetsu Factory
	Cost of selling waste as valuables	62,050	Tomioka district
	Reduction of electricity consumption	47,637	OKI System Center
	Reduction of waste costs	26,347	OKI Circuit Technology
	Reduction of waste costs	16,673	OKI Printed Circuit Ome Factory

■ Main Efforts by OKI Group Overseas

(Unit : 1,000 yen)

Category	Main efforts	Amount	Site
Investment	Introduction of automatic equipment to improve production efficiency	115	OKI Micro Engineering (DG)
Costs	Waste disposal outsourcing costs	2,600	OKI Brasil

* Exchange rates: 16.00 yen/CNY 3.10 yen/THB 32.00 yen/BRL

Detailed Data

Corporate Information

Corporate Profile (As of March 31, 2018)

Corporate Name:	Oki Electric Industry Co., Ltd.
Founded in:	January 1881
Company Established:	November 1, 1949
Capital:	44 billion yen
Employees:	18,978 (Consolidated), 4,024 (Non-consolidated)
Head Office:	1-7-12 Toranomon, Minato-ku, Tokyo 105-8460, Japan TEL: +81-3-3501-3111

ISO14001 Credentials

Certification Organization:	Japan Audit and Certification Organization for Environment and Quality (JACO)
Registration Number:	EC99J2072
Date of Registration:	February 25, 1997
Expiration Date:	March 29, 2020
Organization Name:	OKI Group
Representative Office:	1-7-12 Toranomon, Minato-ku, Tokyo, Japan

Cross-jurisdictional Waste Treatment Manufacturer Scheme

1. Date of Certification: June 29, 2006
2. Certification Number: No. 93
3. Processing Areas: All Japan
4. Type of Industrial Waste:
   Industrial waste comprising information processing equipment and communications equipment manufactured by Oki Electric Industry Co., Ltd., Oki Data Corporation, and Oki Customer Adtech Co.,Ltd.

History of the OKI Group Environmental Management

Nov. 1970	Organized a project team at the headquarters to address pollution problems
Jan. 1971	Established rules for countermeasures against pollution
Sep. 1973	Established a special WG for environmental conservation in the OES (OKI Engineering Standard) Committee
Jun. 1979	Started environmental audits by the headquarters
May. 1981	Started environmental audits at group companies
Apr. 1983	Established rules for environmental management
Apr. 1984	Established environmental management standards (OPES)
Mar. 1993	Formulated the OKI Environmental Protection Activity Plan
Mar. 1993	Abolished totally the use of designated chlorofluorocarbons
Sep. 1993	Abolished totally the use of 1, 1, 1-trichloroethane
May. 1995	Established an advanced evaluation system to assess the environmental impact of product designs and packagings
Dec. 1995	Announced at a press conference of a plan to acquire ISO14001 Certification
Aug. 1996	Formulated the “Basic Environmental Policy” and the “Environmental Protection Activity Plan”
Mar. 1997	Abolished totally the use of trichloroethylene and dichloromethane
Dec. 1998	The goal of OKI Group's all major production sites of acquiring ISO14001 was achieved.
Mar. 1999	Formulated the “Green Procurement Guidelines” as a corporate standard
Aug. 1999	Formulated the “OKI Eco Plan 21”
Sep. 1999	Published the first edition of “Environmental Report 1999”
Apr. 2000	Established Global Environment Division at the headquarters
Aug. 2000	Disclosed environmental accounting in the “Environmental Activity Report 2000”
Nov. 2000	Established a company to recycle used products
Dec. 2000	Established the “OKI Eco Product Registration Standards”
May. 2001	Formulated the “OKI Eco Plan 21 (2001 version)”
Mar. 2002	All production sites of the OKI Group in Japan acquired ISO14001 Certification.
Mar. 2003	All major production sites of the OKI Group in Japan achieved “zero emission” of industrial wastes.
Nov. 2003	Acquired designation as a “Cross-jurisdictional Waste Treatment Manufacturer” from the Ministry of the Environment
Mar. 2004	Integrated various systems for collecting information on chemical substance in products into a company-wide system
Mar. 2004	Achieved lead-free soldering in substrates newly designed in Japan for information equipment
Mar. 2005	Acquired ISO14001 Consolidated Certification
Dec. 2005	Completed transition to ISO14001:2004
Jun. 2006	Obtain the Ministry of Environment's approval as a “Cross-jurisdictional Waste Treatment Manufacturer”
Dec. 2006	The OKI Group in Thailand obtained ISO14001 Consolidated Certification.
Nov. 2007	Established the OKI Group standards for controlling chemical substances in products
Mar. 2008	Major production sites in China area started to obtain ISO14001 Consolidated Certification.
Mar. 2009	Developed AIS compatible functions for the COSMOS system
Mar. 2009	Major production sites in China area obtained ISO14001 Consolidated Certification.
Apr. 2012	Enactment of the OKI Group Environmental Vision 2020
Oct. 2015	Disclosed SCOPE 3
Jun. 2016	Disclosed life-cycle CO_2 emissions
Jul. 2016	Developed chemSHERPA compatible functions for the COSMOS system
Mar. 2018	Completed transition to ISO14001:2015

OKI

Oki Electric Industry Co., Ltd.

<For inquiries>

Global Environment
Oki Electric Industry Co., Ltd.
1-7-12 Toranomon, Minato-ku,
Tokyo 105-8460, Japan

https://www.oki.com/en/eco/ecoreport/2018/