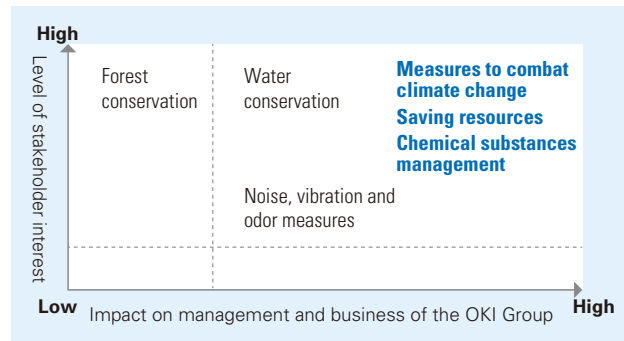# CONSIDERATION FOR THE ENVIRONMENT

## Basic Approach to the Environment——Maximizing Value Creation by Integrating the Environment with Business

The OKI Group promotes environmental management with the aim to maximize value creation through the fusion of the environment and business. OKI has a history of integrating the environmental values with business values, such as contributing to society by "adaptation to climate change" with measures such as disaster prevention and "mitigation of climate change" through the use of ITS services to improve efficiency of customers' logistics.

Also, in our business activities producing such products and services, environmental impact reduction by saving energy and resources, which can lead to reducing costs, is permeating into our daily operations.

The OKI Group organizes these activities in terms of priorities (materiality), taking into consideration stakeholders' interest, impact on management and the business, as shown in the diagram on the right.
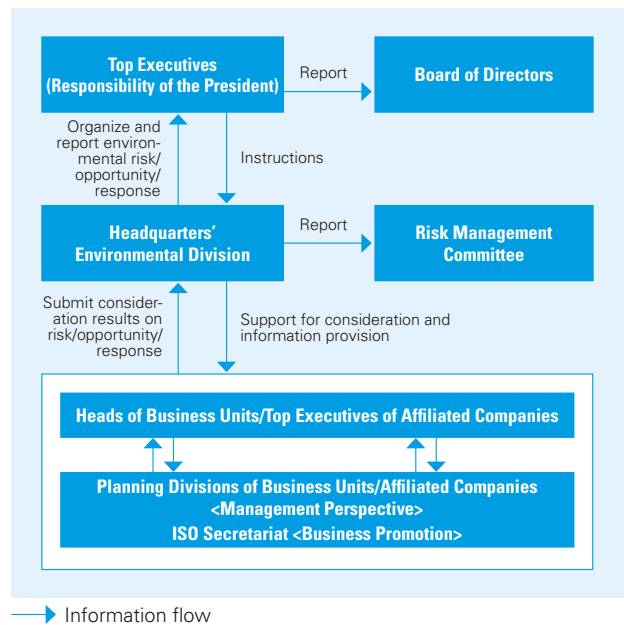
## Strengthening the Dissemination of Information related to Climate Change

In May 2019, OKI announced its support for the "Task Force on Climate-related Financial Disclosures (TCFD*)" recommendations aiming for a virtuous cycle between the economy and the environment. In the future, OKI will disclose and disseminate information in accordance with TCFD recommendations, and will strengthen its efforts to contribute to the realization of a sustainable society brought about by a virtuous cycle of the environment and the economy.

## Risks, Opportunities and Responses

Under the President, OKI started to implement the TCFD recommendations and set categories for making assumptions of certain environmental events occurring associated with climate change (scenario analysis). The Headquarters' environmental division coordinated among related business units, R&D and procurement divisions to identify the risks, opportunities, and responses. We are working to consider highly effective measures to anticipate the future financial impact for the entire Group. Their findings and results are reported to the Management Conference, and then to the Board of Directors.





→ Information flow

*TCFD (Task Force on Climate-related Financial Disclosures): Proposal recommending the necessity to disclose information to investors about the company's responses to climate change

## Assumptions Until 2030

| | Category | Assumed Event | Main Risks | Main Opportunities |
|---|---|---|---|---|
| 1 | Climate change 2°C scenario [Migration risk] | • Further increased and expanded demand for energy saving | [Profit] Increased cost to achieve energy saving standards for hardware products<br>[Profit] Increased cost due to enhanced energy saving at business sites | [Sales] Increased demand for solutions using IoT and AI. (Transportation, construction/ infrastructure, finance/retail, BEMS)/ increased demand for energy-saving products/ needs for more efficiency in office work |
| | | • Increased pressure to switch over to renewable energy | [Sales/Profit] Response to customer requests for renewable energy use | [Sales] Increased demand for renewable energy-driven products |
| 2 | Climate change 4°C scenario [Physical risk] | • Increased and intensified abnormal weather events (Increase in storm and flood damage, extreme heat wave/cold snaps, increased lightning strikes) | [Sales/Profit/Assets] Loss of business sites' assets/ plant shutdowns/broken supply chains due to plants and suppliers affected by disasters and increased air conditioning costs due to rising temperatures | [Sales] Increased demand for advanced disaster prevention and mitigation (disaster prevention and marine fields) |
| 3 | Prevention of contamination with chemical substances | • Expanded and more complicated scope of chemical substances subject to laws and regulations | [Sales] Violation of standards for chemical substance content in products<br>[Sales] Violation of emission standards from production sites | [Sales] Increased demand for more efficient chemical management (manufacturing field) |
| 4 | Resource circulation | • Tougher laws and regulations for marine plastics and micro plastics | [Profit] Soaring cost of waste disposal, disposal companies refusing to collect waste | [Sales] Increased demand for resource-saving products and recycling services |

| Response to Major Risks | Response to Major Opportunities |
|---|---|
| → 1 Life cycle CO2 emission reduction by manufacturing products consuming less power, through automation and energy saving measures, as well as with enhanced access to renewable energy. | → 1 2 3 Creation of innovative businesses and technologies that help to achieve the SDGs |
| → 2 3 Production technology innovation and BCP enhancement | → 1 Development of energy saving products and products that contribute to energy conservation. |
| → 3 Thorough management of chemical substances used in products and onsite | → 3 Sophistication of chemical substance management systems in products and onsite |
| → 4 Waste reduction | → 4 Improving the life-cycle of products and expanding recycling services |

# Formulation of OKI Environmental Challenge 2030/2050

In order to contribute to the resolution of climate change and social issues, which are increasing in severity, we formulated a medium-to long-term environmental vision on April 1, 2019 while also assessing the management risks and opportunities related to the environment. Taking advantage of the OKI Group's comprehensive capabilities, we will embrace these challenges to achieve our goals.

## OKI Environmental Challenge 2030/2050 (Overview)

**1 Prevention of Global Warming**
Life cycle $CO_2$ emissions* : Aiming for 40% reduction by fiscal year 2030, 80% reduction by fiscal year 2050 (compared to fiscal year 2013)

**2 Contributing to the Achievement of the SDGs**
Contribute to achieve the environmental impact reduction targets set in the 2030 SDGs through 1. and 2. listed below
1. Generating innovative products and services and provide solutions conducive to resolving a wide range of environmental issues
2. Realizing innovative technologies for manufacturing and creating things in the supply chain, including workplaces

*Lifecycle $CO_2$ emissions: Group-wide $CO_2$ emissions within all processes, from procurement to business locations, distribution, use of products by customers, and disposal of used products

For more information   https://www.oki.com/en/eco/management/vision.html

# 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.

**[Processing Plants]**
Processing plants are characterized by continuous operation of production facilities and air conditioning equipment without stopping. For these, we are primarily working on a reduction in fixed energy consumption and improvement in operating rate.

**[Assembly Plants]**
Assembly plants have 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, one-piece flow production, and change in layout.
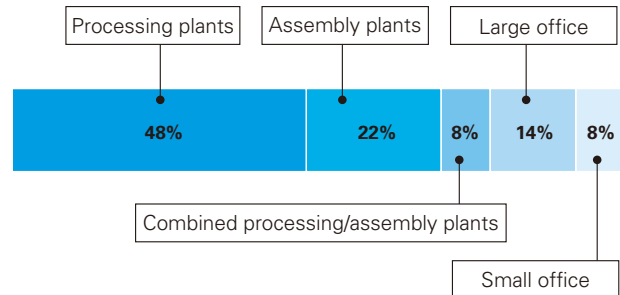
**[Large Office]**
In our large offices, we are promoting improvements through the introduction of energy efficient air conditioning equipment and lighting fixtures.
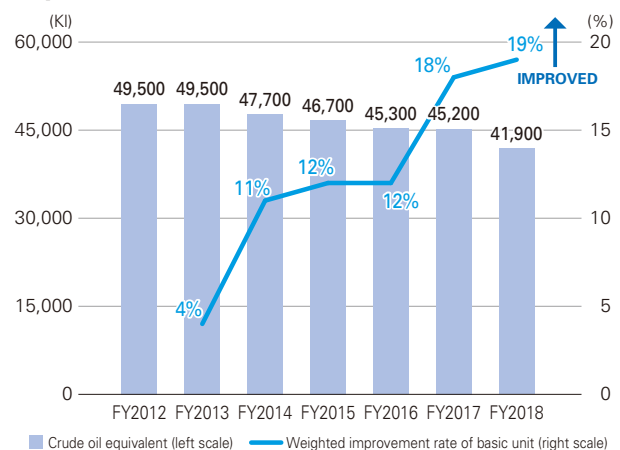
**[Small Office]**
In smaller offices, we are making improvements centered on energy conservation activities and other operational aspects.

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

Processing plants | Assembly plants | Large office

| 48% | 22% | 8% | 14% | 8% |

Combined processing/assembly plants

Small office

## The OKI Group's Energy Consumption and Improvement Rate of Basic Unit

(Kl)

| FY2012 | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 | FY2018 |
|--------|--------|--------|--------|--------|--------|--------|
| 49,500 | 49,500 | 47,700 | 46,700 | 45,300 | 45,200 | 41,900 |
| 4% | 11% | 12% | 12% | 18% | 19% | IMPROVED |

Crude oil equivalent (left scale)
Weighted improvement rate of basic unit (right scale)

**Environmental measures according to site characteristics have been successful, resulting in a tendency toward improvement**

## CONSIDERATION FOR THE ENVIRONMENT

## Examples of Initiatives at Business Sites

Summarized in the table below are examples of initiatives undertaken at each site based on their characteristics and environmental themes.

| Environmental Themes | Examples of Group Achievements |
|---|---|
| Mitigation of climate change | **Manufacturing equipment measures**<br>• Processing plants: Heat dissipation measures for printed circuit board manufacturing equipment<br>• Assembly plants: Introduction of point soldering equipment |
| | **Measures for the entire building**<br>• Plants/Office: Renewal of air conditioner/Introduction of LED lighting<br>• Plants: Introducing sprinklers in the roof and heating using heat waste |
| | **Streamline direct delivery; delivery routes from plants (milk runs, etc.)/Introduction of hybrid vehicles** |
| Adaptation to climate change | **Assess possible storm, flood and lightning damage risk in light of each plant location** |
| Prevention of contamination by chemical substances | **Compliance with various laws and regulations (atmosphere, water system, soil)** |
| | **Improvement of manufacturing process**<br>• Processing plants: Improvement of plating method, substitution of chemicals such as adhesives<br>• Assembly plants: Innovative soldering method |
| Rotation of resources | **Reduction of raw materials, reduction of waste, and improvement of recycling**<br>• Reduction of resource loss by introducing robots and IoT<br>• Optimization of material purchasing using IT systems<br>• Promotion of returnable containers<br>• Improving the yield of plastic materials used in printed circuit board manufacturing<br>• Thorough separation of plastic waste<br>**Reduction of water resources in printed circuit board manufacturing**<br>• Reducing well water usage and ensuring water quality (Change from regular water intake to occasional intake) |
| Biodiversity | **Contributing to biodiversity conservation through energy conservation / chemical substance management / resource recycling**<br><br>**Forest maintenance: Cutting undergrowth and thinning the forest /cutting & cleaning (Japan: Commendation from local government)**<br><br>**Afforestation: Mangrove planting (China) / Planting trees in National protected areas (Thailand)** |

## Contributing to the Environment with Products and Services

The OKI Group offers a wide range of products and services addressing environmental themes such mitigation and adaptation of climate change, recycling, and pollution prevention.

### Mitigation and Adaptation to Climate Change

**Mitigation of climate change (1): Energy saving products**
• Mechatronic products, communication equipment, printers

**Mitigation of climate change (2): Products that contribute to energy conservation**
• ITS service = Logistics efficiency improvements LocoMobi2.0
• Self-service terminal middleware CounterSmart
• BEMS = Building air conditioning monitoring controls

**Adaptation to climate change: Products for extreme weather**
• Disaster prevention information system DPS Core
• Solar powered water level sensor for crisis management
• Portable boat type multi-beam depth sounder instrument CARPHIN V

### Other Environmental Conservation Measures

**Products and services useful for saving resources**
• Easy to disassemble hardware design
• Collection service for used products

**Products and services to eliminate and prevent chemical contamination**
• Management system for chemical substances contained in products
• Services to measure air, water quality, plastics, etc.

### Platforms that Support Products and Services

• AI Edge Computer
• 920MHz band wireless multi-hop technology SmartHop

## "Towards the Future" R&D Themes Relevant to the Environment

The OKI Group's R&D expenses amount to ¥10.7 billion per year all of which is devoted to raising environmental awareness. Listed here in an easy to understand format are items related to the environment.

| Theme Name | Overview |
|---|---|
| "Deep learning" weight reduction Technology (R&D of advanced AI technology) | Improve power consumption efficiency with more efficient calculations using deep learning technology. Adopted for NEDO (New Energy and Industrial Technology Development Organization)'s energy-saving themed projects |
| All silicon photonic integrated module technology | Develop an electronic-photonic integrated chip with high functionality, low power consumption and ultra-small size |
| Next-generation access technology for 5G/IoT (R&D in next-generation optical access technology) | Solve the issue of increased power consumption associated with a rise in data capacity with the spread of 5th generation mobile (5G) |
| R&D of optical signal processing technology for optical fiber sensing | Extend the service life for infrastructure facilities with meticulous monitoring and proper maintenance utilizing this technology and thereby achieve energy and resource reductions |
| R&D of future communication environment (R&D of multimedia system technology) | Creation of a communication environment that allows easy communication with remote offices; produce energy savings by reducing energy usage associated with movement and improving operational efficiency |
| Technology for anomaly detection and failure prediction of manufacturing equipment for Industry 4.0 (research on data mining technology) | Anomaly detection technology for manufacturing equipment, using vibration and log data at plants. Achieve resource savings by controlling parts inventory and reducing energy consumption associated with transportation, etc. |
| R&D into the use of AI solutions in the printing field | A technology that uses AI to automate and streamline the evaluation of printing quality of industrial printers. Promote resource and energy savings by preventing printing errors caused by misjudging printing quality |

## Specific Measures and Activities (FY2018 Results)

The OKI Group has acquired ISO 14001 integrated certification. We have established systems based on product themes related to product development and businesses as well as business themes associated to the plants and offices. The results for fiscal year 2018 were as follows.

| Category | Activity Content | FY2018 Targets → Outcome |
|---|---|---|
| **Realization of a low-carbon society** | | |
| Products | Development of energy-saving products | 20% or more of developed products → 23% (energy saving of 22% or more over conventional products) |
| Business activities | Energy-savings at workplaces (plants and offices) | Improvement of 19% or more → 19% improvement (basic unit vs. fiscal year 2012*1) |
| **Prevention of pollution** | | |
| Products | Development of products complying with regulations on chemical substances in products | 35 or more products → 37 products |
| Products | Ensuring legal compliance by supporting the new standard survey form (chemical substance management system/management procedure manual) | Respond to addition of RoHS prohibited substances → Started from July 2018 Updated IT system to support chemSHERPA™ → Completed Confirm status of compliance with laws and regulations → No legal violations |
| Business activities | Reduction of chemical substance emissions from plants (atmosphere/water system/soil) | Improvement of 39% or more → 35% improvement (chemical substance emission rate vs. fiscal year 2012*2) |
| Business activities | Compliance with chemical substance related regulations (atmosphere/water system/soil) | Compliance with legal audits, Zero legal violations → Achieved |
| **Resource circulation** | | |
| Products | Recycling of used products | 2,600t or more → 4,230t |
| Products | Development of easily recyclable products | 31 or more products → 31 products |
| Business activities | Reduction and appropriate disposal of waste/recycling rate | Recycling rate 87% or more → 82% |
| Business activities | Streamlining of resource input | Improvement of 40% or more → 37% improvement (resource input rate vs. fiscal year 2012*3) |
| **Common** | | |
| Biodiversity conservation | Realization of low-carbon societies /prevention of pollution /resource circulation | Promotion of the above initiatives*4 |

*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 resources
*4 Efforts for conserving biodiversity

Details of the OKI Group's environmental activities are provided on our website.

Website "Environmental Conservation"
**https://www.oki.com/en/eco/**