

**KIOXIA**



# Environmental Report

**KIOXIA Corporation  
Yokkaichi Plant**

## Yokkaichi Plant Overview

<b>Founded</b>	January 1992
<b>General manager</b>	Tomoharu Matsushita
<b>Location</b>	Yokkaichi Plant: 800 Yamanoisshiki-cho, Yokkaichi-shi, Mie Prefecture, Japan Asahi Test Center: 2000 Nao, Asahi-cho, Mie-gun, Mie Prefecture, Japan
<b>Site area</b>	Yokkaichi Plant: 694,000 m <sup>2</sup> Asahi Test Center: 47,862 m <sup>2</sup>
<b>Number of employees</b>	6,900 (as of March 31, 2022)
<b>Main products</b>	Semiconductor memory devices (NAND flash memory, etc.)

## Products

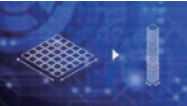
- Three-Dimensional Flash memory: BiCS FLASH™
- NAND Flash Memory with an Integrated Controller (e-MMC\*1, UFS\*2)
- SLC NAND Flash Memory (SLC NAND, BENAND™)
- Solid State Drives (Enterprise SSD, Data Center SSD, Client SSD)
- Personal Products (microSD Memory Cards, SD Memory Cards, USB Flash Drives)

\*1 Abbreviation for "embedded Multi Media Card," used for embedded storage in products such as smartphones.  
\*2 Abbreviation for "Universal Flash Storage," used in a variety of products as embedded storage that is faster than e-MMC.

### Features of BiCS FLASH™


**High Density and High Capacity**

The vertically stacked three-dimensional (3D) flash memory, BiCS FLASH, has far higher die area density compared to the prior state-of-the-art technology, two-dimensional (2D) NAND flash memory.



**Low Power Consumption**

BiCS FLASH reduced the power consumption per unit of processing data by increasing the amount of data that can be processed in a unit of time (i.e., faster processing speed) compared to the 2D NAND flash memory.





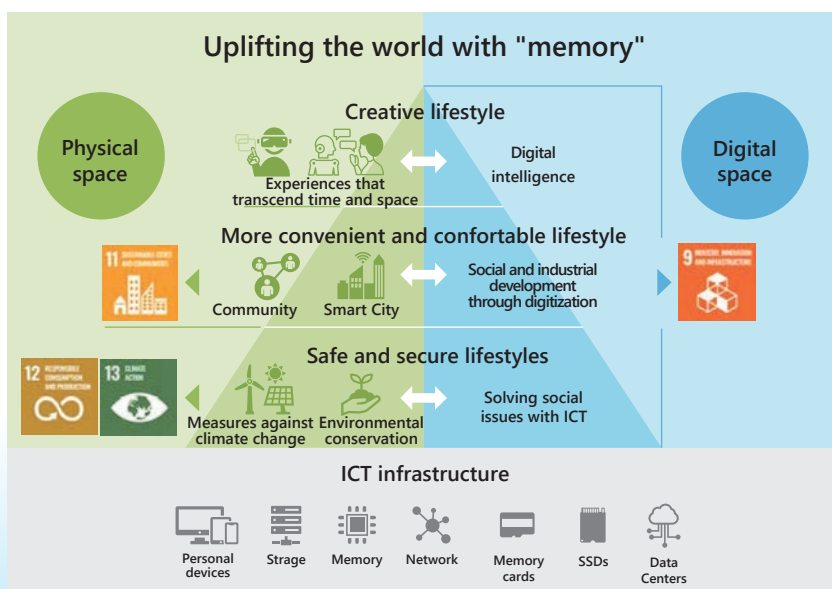


## Contributions to Achieving the SDGs through Our Products

The 17 Sustainable Development Goals (SDGs) set out in the 2030 Agenda for Sustainable Development, adopted at the UN Summit in September 2015, officially came into force on 1 January 2016. Based on the SDGs, which are universally applicable to all people until 2030, countries are joining their forces to end poverty in all its forms, fight inequality and address climate change while leaving no one behind.

The SDGs aim to end poverty in all its forms and call on all countries - poor, rich and middle-income - to protect the planet while pursuing prosperity. The name "KIOXIA" reflects our strong determination to change the world by storing "memories" ("kioku" in Japanese) created by society and using them to create new "value" ("axia" in Greek). Our mission is to uplift the world with "memory."

The KIOXIA Group, which provides the value of "memory" to society through products such as flash memory and solid state drives (SSDs), will continue to develop a sustainable society by contributing to the SDGs through its business. Relevant SDG icons are shown for each environmental activity.



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## Message from the General Manager

Yokkaichi plant was established in 1992 as a semiconductor memory manufacturing facility, and this year we celebrated our 30th anniversary. The plant initially manufactured DRAMs, then in 2002 it commenced the production of NAND flash memory. It currently manufactures mainly 3D flash memory. The site continues to expand as the market grows, and is now one of the largest flash memory plants in the world, with six manufacturing facilities. We have also strengthened the research and development of next-generation semiconductor devices, with the Memory R&D Center commencing operations in 2018. In addition, we started operation of Fab7, a state-of-the-art manufacturing facility in 2022. We continue to evolve with the aim of becoming the world's most advanced semiconductor memory plant, where research, development and production work together.

NAND flash memories are used for data storage in various products, including USB sticks and other portable storage media, smartphones, tablets, PCs, digital cameras, games, smartwatches, and data centers. NAND flash memory is also being used for use cases such as AI, IoT, and cloud computing.

In October 2019, we changed our company name to "KIOXIA", and restated our mission as "Uplifting the World with 'Memory.'" We hope that our flash memory will play an important role in storing ever-increasing amounts of information and that this information will thereby be passed on to future generations.

At the same time, the expectations and demands of society for our plant are steadily increasing, as we contribute to the



**Tomoharu Matsushita**

Managing Executive Officer  
of KIOXIA Corporation and  
General Manager of  
Yokkaichi Plant

reduction of greenhouse gas emissions as agreed in the Paris Agreement and participate in the Sustainable Development Goals (SDGs) adopted by the United Nations. In order to meet these expectations, we will not only comply with laws and regulations and social norms, but also strive to contribute to solving social issues through our business.

Yokkaichi in Japan's Mie prefecture is blessed with a rich natural environment, abundant human resources, and an outstanding industrial base. We are deeply grateful to local residents and all other people for their understanding and support, which has enabled us to grow our business globally.

We will continue to prioritize environmental protection and social initiatives, thus fulfilling expectations regarding our corporate responsibility. We will endeavor to help realize a better global environment and contribute to the development of sustainable society. Our aim is to make Yokkaichi Plant a facility that is admired and trusted by everyone. We look forward to your continued understanding and support.



## Kioxia Group's Environmental Policy

### - Mission -

Kioxia Group's Environmental Policy ensures we conduct business in a way that enhances and preserves the environment. Through purposeful, sustainable actions, we're prioritizing being responsible stewards of the environment to do our part in maintaining our planet's health for years to come.

### - Policy -


In addition to complying with environmental laws and regulations in the regions in which it operates, Kioxia Group considers environmental stewardship to be one of our primary responsibilities. We take actions to limit our environmental impact throughout our supply chain of memory, applied and related software products that support information infrastructure. From taking systematic and globally accredited steps to reduce our pollution and greenhouse gas emissions from our manufacturing processes, to regularly auditing and reviewing our activities to constantly improve our environmental management system, Kioxia Group takes deliberate action to ensure efficient and effective operations.

### - Execution -

- 1) We strive to make sustainable memory, applied and related software products by using high-capacity, miniaturized and powersaving technologies. We also perform ongoing environmental assessments of our products and manufacturing processes, as well as a targeted effort to reduce our overall raw material usage.
- 2) We are doing our part to help prevent global warming through initiatives that directly reduce greenhouse gas emissions. This includes the development of energy-saving technologies – especially within power systems and manufacturing machinery – productivity improvements and introducing clean energies.
- 3) We purposefully take actions aligned with the “three Rs” – reduce, reuse, recycle. Specifically, we focus on developing resource saving technologies and implementing productivity efficiencies, as well as limiting the use of water resources around our plant sites and returning water used in production to the environment after effective purification treatment.
- 4) We limit environmental risk in our operations by being conscious of the chemicals we use in production and developing technologies that reduce our use of certain chemicals. Through responsible handling and management of production-related chemicals, we also strive to prevent associated pollution.
- 5) We strive to reduce the impact of our business activities on biodiversity, and pursue activities that aim to preserve biodiversity in order to help conserve the environment.
- 6) We regularly disclose information and updates on our sustainability efforts – including new energy-saving technologies – through environmental advertising, exhibitions and media and collaboration with various stakeholders including the local communities in which we operate.
- 7) We underscore the importance of environmental stewardship with our employees, who promise to keep sustainability top-of-mind in all business activities.

This Environmental Policy is core to Kioxia Group's operations – it is available internally to global employees of Kioxia Group and externally to customers, media and the general public. We are committed to pursuing corporate activities that are in line with this policy.

February 1st, 2020



President and Chief Executive Officer  
Kioxia Holdings Corporation



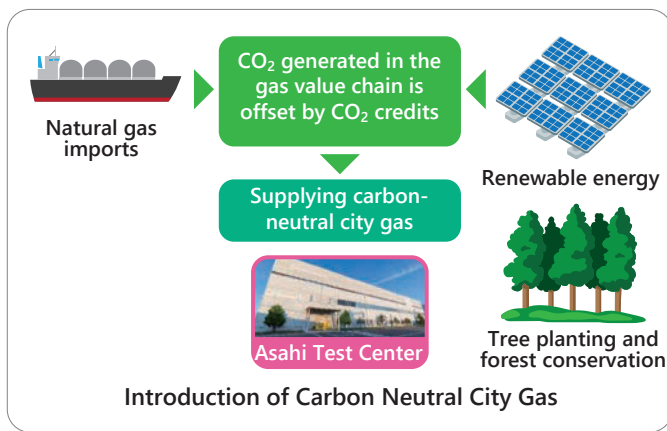


## Topics

### Introduction of Carbon Neutral City Gas

In November 2021, carbon neutral city gas supplied by Toho Gas Co., Ltd. was introduced to Asahi Test Center. Carbon neutral city gas is produced by offsetting the CO<sub>2</sub> generated in the process from natural gas extraction to combustion with CO<sub>2</sub> credits. The reduction in CO<sub>2</sub> emissions is approximately 8,000 tons over five years.

\*CO<sub>2</sub> credits are certified by a reliable verification organization for CO<sub>2</sub> reductions achieved by environmental conservation projects around the world.



### Received Letters of Appreciation

In May 2021, we received a letter of appreciation from the Yokkaichi City Council of Social Welfare for its longstanding social welfare efforts (donation of calendars and organizers (since 2007), down products and aluminum cans (since 2015), masks (2020), and wheelchairs (2021)). We also received letters of appreciation for our food drive in July 2021, for our food drive and wheelchair donation in October 2021, and for our calendar and notebook collection in January 2022.



May 2021



July 2021



October 2021



January 2022

### Beach Cleanup Activity

In June 2022, about 150 employees and family members participated in a beach cleanup activity. Yoshizaki beach, located in Yokkaichi City, is a beach that sea turtles came to in the past to spawn. This cleanup activity is run by the local community and aims to encourage sea turtles to return there.



### Support for Owl Conservation Activities

We are working to conserve biodiversity in order to understand the impact of our business activities on biodiversity, to reduce the impact on biodiversity, and to promote social contribution activities.

In March 2018, our plant signed the "Mie Biodiversity Partnership Agreement" with the Mie Prefectural Yokkaichi West High School Nature Study Group to promote the "Owl Conservation Project". As part of this activity, we support equipments to observe owls from laying eggs to fledging of chicks in order to pass on the rich natural environment of the region to the next generation. As a result, we were able to capture video of the nesting process for four consecutive years starting in 2019. In addition, we are facilitating this activity through tripartite consultations\*.

Year	Main Activities and Future Plans
2018	<ul style="list-style-type: none"> <li>● Signed a "Mie Biodiversity Partnership Agreement"</li> <li>● Determined specifications of the observation devices</li> <li>● Installed and adjusted the observation devices</li> <li>● Started to promote the project within and outside the company</li> </ul>
2019	<ul style="list-style-type: none"> <li>● Tripartite discussion on the results of activities in FY2018 and the activity plans for FY2019</li> <li>● Improved the observation devices (Solar panels, Batteries, Cameras, and Hard-disk video recorder)</li> </ul>
2020	<ul style="list-style-type: none"> <li>● Tripartite discussion on the results of activities in FY2019 and the activity plans for FY2020</li> <li>● Improved the observation devices (Replacement of hard disk, inverter, and router)</li> </ul>
2021	<ul style="list-style-type: none"> <li>● Re-enter into the agreement (automatically renewed annually thereafter)</li> <li>● Tripartite discussion on the results of activities in FY2020 and the activity plans for FY2021</li> <li>● Support for observation equipment</li> <li>● Review of agreement (Kuwana High School added)</li> </ul>
2022	<ul style="list-style-type: none"> <li>● Four-party discussions on the results of activities in FY2021 and the activity plan for FY2022</li> <li>● Support for observation equipment</li> </ul>

\*From 2022, 4-party consultation including Kuwana High School.



Laying eggs



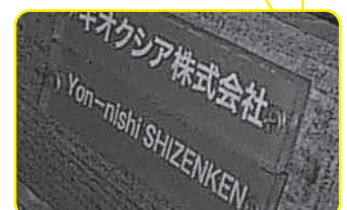
Hatching



Nesting chicks



Fledging of chicks



Signboard with company name installed

## Environmental Measures at Fab7

Fab7 started operation in 2022 to increase production capacity of 3D flash memory "BiCS FLASH™". Fab7 has implemented various environmental measures, including the introduction of latest energy-saving manufacturing equipments.

Main Environmental Measures	
Global Warming	<ul style="list-style-type: none"> <li>● Energy conservation measures (e.g., introduction of energy-efficient manufacturing equipments)</li> <li>● Reduction of CO<sub>2</sub> emissions by transporting wastewater sludge by large vehicles</li> </ul>
Water Resource	<ul style="list-style-type: none"> <li>● Effective use of water resources (recovery rate: approx. 90%)</li> <li>● Reduction of the total phosphorus concentration agreement value* in wastewater compared to the conventional</li> <li>● In case of emergency, such as abnormal wastewater discharge, the wastewater is accepted into an emergency water storage tank, reprocessed, and discharged.</li> </ul> <p>*Yokkaichi City Pollution Prevention Agreement</p>
Noise and Odor	<ul style="list-style-type: none"> <li>● Install soundproof walls and low-noise silencers</li> <li>● Install activated carbon deodorization towers in septic tanks, etc.</li> </ul>



Image of the completed Fab7

## Environmental Lecture

In May 2022, twenty-nine students and adults participated in an environmental lecture at Yokkaichi University. The main contents of the lecture were plant overview, compliance, SDGs initiatives, and Reduction activities of environmental impact. The main contents of the lecture were plant overview, compliance, SDGs initiatives, and Reduction activities of environmental impact. The lecture was also a good opportunity for them to understand the Yokkaichi Plant by experiencing the clean room VR and viewing wafers.



## Virtual Yokkaichi Environmental Fair

In February 2022, the "Virtual Environmental Fair" was held for the first time under the auspices of Yokkaichi City, and our plant participated in the fair. People of all ages accessed the fair, and we promoted Kioxia's SDGs initiatives and the Yokkaichi Plant's environmental activities.



Promoting Environmental Activities in the Metaverse

## Children's Environmental Education

We have been conducting environmental lectures at elementary schools in the neighborhood since 2006. In addition, we have been conducting children's environmental lectures at the Yokkaichi Pollution and Environmental Miraikan since 2018.

Elementary and junior high school students and their parents participated in the lecture, where they learned about global warming through experiments and other activities and considered environmentally friendly ways of living. The event also provided an opportunity to get to know the plant through a virtual reality tour of its clean room.

In 2021, we visited a total of two elementary schools in Yokkaichi city, a total of about 3,150 children have taken the course since 2006. We aim to provide environmental education that children can enjoy while utilizing local mascot characters.



Elementary school



Yokkaichi Pollution and Environmental Miraikan

## Major Global Warming Countermeasures Considered by Children

- Don't buy what I don't need
- Use things carefully
- Don't use home appliances too much
- Grow plants
- Take a bath continuously
- Go to bed early and get up early
- Turn off the water when brushing teeth
- Stay in one room as much as possible

## Mie Prefecture SDGs Promotion Partner

In April 2022, the Yokkaichi Plant was registered as a Mie Prefecture SDGs Promotion Partner (2nd period: January to March 2022).

The "Mie SDGs Promotion Partner Registration System" is a system established by Mie Prefecture to encourage SDG initiatives by companies and organizations in Mie Prefecture and to contribute to the realization of a sustainable society. The Yokkaichi Plant is committed to contributing to the achievement of the SDGs and the realization of a sustainable society.



### Key Initiatives and Targets

**Contribution through Our Products**  
storage technology development and high manufacturing efficiency : 3 measures/year or more



**Reduction of environmental impact in manufacturing**

- 1 Improving the intensity of total waste generation : Improvement from the previous year
- 2 Improving the intensity of chemical emissions : Improvement from the previous year



**Climate Action**

- 1 Reducing energy-derived CO<sub>2</sub> : Improvement over 1% in the previous year
- 2 Installing abatement equipment on relevant machinery : 100% (continuation)
- 3 Introducing renewable energy : 100% renewable energy by 2040





## CSR and Regional Communication

### Social Contribution Activities through Resource Recovery

With the aim of raising environmental awareness of each and every employee, all employees, including those of resident companies on the premises, are involved in a variety of social contribution activities.



#### 1. Calendar and Notebook Collection (since 2007)

We collect calendars and notebooks that have become surplus in our plant, and donate them to the Yokkaichi City Council of Social Welfare. The calendars and notebooks are reused at nursing homes and facilities for the elderly, and the notebooks are used to communicate with the hearing impaired. (2021 results : 1,253 calendars and 373 notebooks)

#### 2. Bottle Cap Collection (since 2008)



We collect plastic bottle caps and donate vaccines for children in developing countries through the Ecopac Movement, a nonprofit organization. In April 2015, we changed the recipient of the bottle caps to a non-profit organization called "Re Lifestyle", and are continuing the collection activities. The collected bottle caps are donated to Re Lifestyle, and the proceeds from the sale of the caps are used to support polio prevention in developing countries through the Japan Committee for Vaccines for the World's Children, an authorized NPO. (2021 result : 323,000 pieces, equivalent to 647 vaccines)

#### 3. Charity Eco-Bazaar (since 2012)

We have been holding an in-house bazaar where employees bring in unwanted items from their homes and sell them to employees. Through the bazaar, we are contributing to the greening of Yokkaichi City by donating the proceeds to the Yokkaichi City Greening Fund, in addition to the effective use (reduce and reuse) of unnecessary items. (2019\* results: approximately 38,800 yen donated)

#### 4. Miswritten Postcard Collection (since 2014)



Our plant is cooperating with the World Terakoya Movement\* (UNESCO Association of Japan), which supports education in developing countries by collecting miswritten postcards.. (2021 result : 167 sheets, equivalent 8,348 Yen)

\*As of December 2019, there are approximately 64 million children in the world who are unable to go to school and 750 million adults (15 years of age and older) who cannot read or write. As part of our efforts to achieve the Sustainable Development Goals (SDGs), we will contribute to the creation of self-reliant and sustainable societies by fostering human resources in impoverished areas around the world through "learning spaces (terakoya)"

#### 5. Used Stamp Collection (since 2015)

We collect used stamps, and donate them to a non-profit organization called "Live with Friends on the Earth (LIFE)". The proceeds are used to support agriculture in India and Indonesia. (2021 result : 5,741 sheets)

#### 6. Down Products Collection (since 2016)

Our plant is cooperating with the "Down Project", in which we collect used down products and donate the sale proceeds to the Mie Community Chest of Japan. The proceeds are used to support local contribution activities in Yokkaichi City and Asahi Town.(FY2021 result : 4 down jackets)

#### 7. Disposable Contact Lens Case Collection (since 2016)

Our plant is cooperating with the "Eye City eco project," a campaign to recycle the empty cases of disposable contact lenses run by HOYA Corporation, which operates the "Eye City" contact lens specialty store. Collected used contact lens cases are recycled as polypropylene, and part of the proceeds from their sale are donated to the Eye Bank Association. (2021 result : 36,938 pieces, equivalent to 826 Yen)

#### 8. Aluminum Can Collection (since 2016)

In order to support the independence of the disabled, employees of the plant bring aluminum cans from their homes and donate them to the "Asahi Works", a facility to support the independence of people with disabilities. At the "Asake Works", the disabled crush the aluminum cans using a machine, which is then sold to a recycling company, and the proceeds are used to supplement their salaries. (2021 result: 3,103 cans, equivalent to 4,034Yen)

#### 9. Used Book Collection (since 2018)

Our plant is cooperating with "ARIGATO-BON" project by Trusted Capital Foundation which supports NPOs through books that are no longer read. We support "Wakka", a non-profit organization that works to support the lives and employment of children and young people by creating places for children and operating a children's cafeteria. (July, 2021 result: 1,600Yen)





## 10. Mask Collection (2020\*)

We collected about 2,600 unneeded masks from the households of our plant employees and donated them to the Yokkaichi City Council of Social Welfare through the Next Step Research Association. These masks are now being used at welfare facilities.

\*One on activity

## 11. Food Drive (since 2021)

A food drive is an activity in which households bring in surplus food and donate it to people in need. We are cooperating with the efforts of the Yokkaichi City Council of Social Welfare to help those who are receiving public assistance to get out of poverty and live on their own income. (June, 2021 result: 736 items)

## 12. Wheelchair Collection (2021\*)

Our plant donated wheelchairs to the Yokkaichi City Council of Social Welfare to replace wheelchairs that had been in use for 10 years. The donated wheelchairs are used for lending to people living in the city.

\*One on activity

## Environmental Liaison Meeting with the Local Community Association

Our plant holds regular liaison meetings with the local community association. At the liaison meetings, our plant reports on environmental measurement data on water and air quality, preparedness for the Tokai earthquake, and the status of environmental conservation efforts that will lead to safety and security in the region, and gives tours of its environmental facilities. In 2020 and 2021, environmental liaison meetings were cancelled due to the Corona disaster and environmental reports were given to the local community association. In order to promote corporate activities close to the local community, our plant will continue to promote communication with them.



Tour of water treatment facilities

## Environmental Internship Program

Every year, we accept students from Mie University for an environmental internship program\*. In September 2019, five Mie University students participated in an environmental internship at our plant. Through the experience of environmental work, including environmental management systems, environmental measurements and waste management, they had the opportunity to think about their future jobs and careers.

\*Canceled due to the Corona disaster in 2020 and 2021.

### Student Impressions

- I have learned so many different things, such as the manufacturing process, wastewater treatment after manufacturing, and environmental analysis. I would like to make the most of my experience here and continue to do my best in the future.
- This plant not only treats the various substances discharged, but also spends money to steadily measure the water quality of rivers and oceans. I thought they were recognized by the general public as an environmentally conscious plant.
- This plant has an environment where we can work safely and securely, and trust each other. I also felt that this plant had a good atmosphere.
- I am glad that I was able to experience something that I would never be able to experience in my normal school life.



Sampling



Analysis



Presentation

## Environmental Exhibition

Since 2008, we have participated in annual environmental events organized by Yokkaichi City, Mie Prefecture, and others. In addition to introducing our environmental activities and our memory products, we have set up an area where visitors can take a virtual reality tour of the clean room to communicate with the local community.

In 2020 and 2021, environmental events were cancelled due to the Corona disaster, so we introduced the plant's initiatives through environmental panel displays at nearby facilities and a virtual exhibition.

In addition, we participated for the first time in "MESSE NAGOYA 2021," an exhibition for cross-industrial exchange, and introduced our environmental initiatives.



Environmental Exhibition



Panel Display



Virtual Exhibition



MESSE NAGOYA 2021

## Environmental Report

In order to have as many people as possible understand our environmental efforts, we have published an environmental report (site report) since fiscal 2003, and this is the 20th edition. We will continue to publish the environmental report in the future with the aim of making it easy to read. We also publish an "Environmental Pamphlet" for children.



Environmental Report



Pamphlet for Children



## Education and Training

### Environment Education

Once a year, we provide environmental education to all employees working in the Yokkaichi Plant premises, including those who work on the premises. The educational textbook includes not only global warming prevention and compliance, but also matters of global interest such as the Paris Agreement, SDGs and ESG investment. Each division also prepares its own educational textbooks on environmental activities that require independent efforts by each department, providing an opportunity for employees to become actively involved in environmental activities.

In addition to specific employee training for those engaged in tasks with the potential to have a large impact on the environment, we also provide environmental education for heads of departments, newly assigned employees, internal environmental auditors, and other employees at different levels.

	Course	Theme
Stratified education	For department managers	Responsibilities and authority
	For all employees	Revisions to EMS, Environmental policy, Objectives and, targets
	For newly assigned employees	Global Environmental issues, EMS, Environmental policy
Functional education	For specific employees	Compliance with environmental laws, environmental impact incurred by non-conformance with operation standards and procedures for specific jobs
	For environmental auditors	Roles and responsibilities, Revisions to environmental laws

### Monthly Events

Every year, during Environment Month in June, 3Rs\* Promotion Month in October, and Energy Conservation Month in February, we hold employee-participation events to raise employees' environmental awareness. In order to prevent the spread of the new coronavirus, events with risk of infection, such as tours, have been canceled from 2020.

\*3Rs: Reduce, Reuse and Recycle

#### 1. Tour of External Environmental Facilities

We visited the Chubu Electric Power Company's West Nagoya Thermal Power Station in February 2019, which was recognized by Guinness World Records for the world's highest power generation efficiency in March 2018, which led to an increased awareness of energy conservation. Also, we visited the Yokkaichi City Clean Center in October 2019, and were able to deepen our understanding of Yokkaichi City's waste disposal and resource utilization methods. Since 2020, we have remotely hosted tours of the plant's power facilities to deepen employee understanding.



West Nagoya Thermal Power Station

#### 2. 3R Master Certification

The plant has conducted its own 3R Master certification test every year from 2014 to 2019. 170 employees have been certified as 3R Master and are working to promote the 3Rs as key persons in their respective departments.



Yokkaichi City Clean Center

#### 3. Charity Eco-Bazaar

We held an in-house bazaar in October 2019. Employees brought in unwanted household items and sold them to employees. Through the bazaar, we contribute to the effective use of unwanted items (reduce and reuse) and also contribute to the greening of Yokkaichi City by donating the proceeds to the Yokkaichi City Greening Fund (2019 results: 38,800Yen). We also received an award from the mayor of Yokkaichi City for our contribution to the greening of the city in October, 2020.



3R Master Certification

#### 4. Road Cleaning around the Plant

Every year during Environment Month and 3R Promotion Month, our plant employees, including the general manager, clean up the roads around the plant. In June 2022, approximately 140 employees participated in the cleanup activities and collected approximately 28 kg of trash. we collected approximately 24 kg of trash during the clean-up activity.



Road Cleaning around the Plant



Charity Eco-Bazaar

#### 5. Raising environmental awareness through a call for ideas

We solicited ideas for extending the life of household foodstuffs and daily necessities in October 2021, and we solicited ideas for reducing plastic in response to the enforcement of the "Law for Promotion of Recycling of Plastic Resources" in June 2022. The best ideas were posted on the environmental Information "Eco Time" to share them with others.



## Greening Activities on site

We have been filling the area around each of our buildings with flowers since June 2017 with the aim of raising environmental awareness, improving our image, and creating a healing space for our employees. As an event to commemorate the 30th anniversary of the plant's founding, a carpet of lawn cherry trees was created next to the pedestrian walkway on the west

side of the administration building, and many employees participated in the event in June 2022. In addition, the flower bed on the west side of the administration building was renewed and the 30th anniversary was expressed in flower letters.



Lawn Cherry Blossom Planting Event



Flower Bed on the West Side of the Administration Building

## Publication of Energy-saving Wall Newspapers and Environmental Information "Eco Time"

Since April 2014, we have been publishing the energy-saving wall newspapers, which introduces topics of the plant's energy conservation activities, interviews with energy conservation staff in each division, and energy conservation trends in Japan and abroad.

In May 2017, our plant also began publishing "Eco Time," an environmental newsletter that introduces topics in the plant's environmental activities, environmental activities unique to each division, eco-friendly initiatives that can be carried out at home, and environmental trends in Japan and abroad. In recent years, we have made an effort to provide information on various initiatives to prevent global warming, trends in renewable energy, environmental laws and regulations in various countries, the SDGs, ESG investment, and other issues that are in the global spotlight.



Energy-saving Wall Newspaper



Environmental Information "Eco Time"

## Evaluation from External Parties

### Energy Conservation Merit Award (2021)

Two employees of our plant received the Energy Conservation Center Tokai Branch Manager's Award for Distinguished Contributions to Energy Conservation, which is given to individuals who have contributed to energy conservation in a variety of fields, including energy management and education on energy conservation.



Recipients of the Energy Conservation Promotion Merit Award

### Urban Greening Meritorious Achievement Award (2020)

In recognition of our continuous donation of proceeds from the charity eco-bazaar to the Yokkaichi City Greening Fund, we received the urban greening meritorious achievement award from Yokkaichi City.

\*his award is given to individuals and organizations that cooperate with the urban greening of Yokkaichi City.



Commendation Ceremony

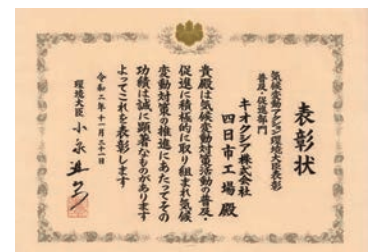
### Climate Change Action Minister of the Environment Award (2020)

KIOXIA's Yokkaichi Plant received "Climate Change Action Minister of the Environment Award (Mitigation field in the Dissemination/Promotion category)" in November 2020. This award constitutes part of the promotion of measures tackling climate change issues, and recognizes individuals or groups who have made remarkable contributions towards the prevention of global warming. The Yokkaichi Plant was recognized for its cross-organizational energy-saving activities and community-based efforts to mitigate climate change.

令和2年度  
気候変動アクション  
環境大臣表彰



Minister of the Environment



### Yokkaichi City Environmental Activity Award (2019)

We received the Yokkaichi City Environmental Activity Award in recognition of our social contribution activities through children's environmental classes, support for owl protection activities, and resource collection in cooperation with the community and local government.



Commendation Ceremony

## Reduction of Greenhouse Gases



### Efforts to Reduce PFC Emissions

A large amount and variety of greenhouse gases (PFC) are used in the P-CVD (plasma CVD) process for forming thin films on wafers, the Metal-CVD process, the Hot process, and the DRY (dry etching) process for microfabricating wiring and contact holes. We are focusing on reducing PFC emissions in the manufacturing process from source to discharge as a pillar of our global warming countermeasures. In 2021, we implemented the following measures to reduce PFC emissions:

- (1) Installing the abatement equipment that breaks down PFCs into gases with low global warming potential and discharges them,
- (2) Optimizing the reaction chamber cleaning frequency,
- (3) Introducing high-efficiency equipment for cleaning the reaction chamber,
- and
- (4) optimizing the reaction chamber conditioning

In particular, the installation rate for (1) has always been 100%, which has made a significant contribution to reduce PFC emissions. For new products planned for release in the future, we are working to reduce PFC emissions by implementing measures to reduce consumption linked to manufacturing.



PFC Abatement Equipment

No.	Measure	Process	Target gas	Remark
①	100% installation of abatement equipment	P-CVD, DRY, Metal	CF <sub>4</sub> , C <sub>4</sub> F <sub>8</sub> , CHF <sub>3</sub> , SF <sub>6</sub> , NF <sub>3</sub> , CH <sub>2</sub> F <sub>2</sub> , CH <sub>3</sub> F, CH <sub>4</sub> , N <sub>2</sub> O	Continued installation in newly installed facilities
②	Reaction chamber cleaning frequency optimization	CVD	NF <sub>3</sub> , N <sub>2</sub> O	2021: Finished
③	Reaction chamber cleaning time optimization	Metal	NF <sub>3</sub>	Continued implementation
④	Reaction chamber conditioning optimization	DRY	C <sub>4</sub> F <sub>8</sub>	2021: Finished

## Reduction of Energy-derived CO<sub>2</sub>

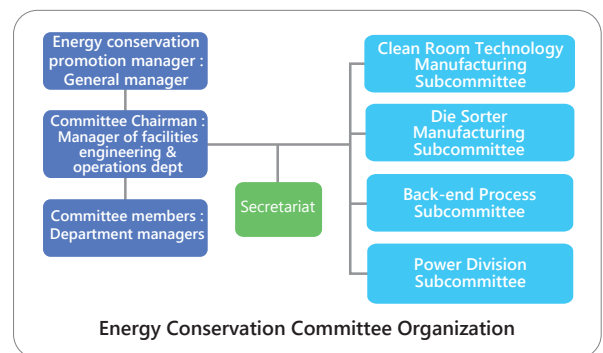


### Efforts to Reduce CO<sub>2</sub> Emissions

The production technology, manufacturing, and facilities divisions of our plant have organized an Energy Conservation Committee to work across the organization to reduce energy-derived CO<sub>2</sub> emissions, and have formed specialized subcommittees (Clean Room Technology Manufacturing Subcommittee, Die Sorter Manufacturing Subcommittee, Back-end Process Subcommittee, and Power Division Subcommittee) as subordinate organizations.

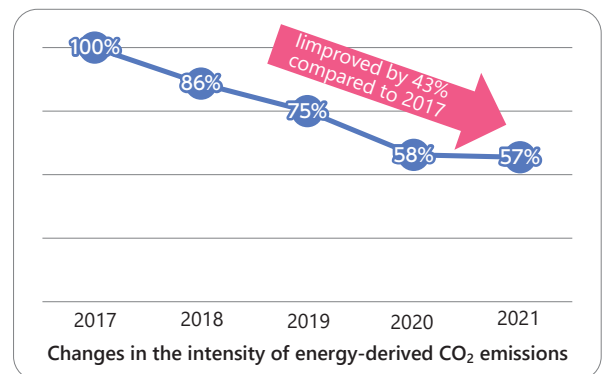
Every year, each subcommittee sets energy-derived CO<sub>2</sub> reduction targets, and implements energy-saving measures for manufacturing and power equipment. The intensity\* of energy-derived CO<sub>2</sub> emissions in 2021 improved by 43% compared to 2017.

\* CO<sub>2</sub> emissions per production memory capacity is used as an indicator that can be used to evaluate efforts.



Energy Conservation Committee Organization

Specialized Subcommittees	Measure
Clean Room Technology Manufacturing	109 measures including throughput improvement, heater-less and chiller-less manufacturing equipment
Die Sorter Manufacturing	4 measures including installation of energy saving equipment
Back-end Process	5 measures including improvement of processing capacity by updating facilities
Power Division	101 measures including optimization of power equipment operation







## Reduction of Wastes

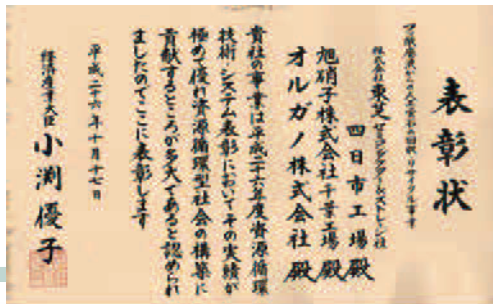
Although the amount of waste generated is on the rise due to the expansion of the scale of this plant, we are promoting the reduction of chemicals and gas usage by improving the manufacturing process, etc., and are actively working to increase the recycling of generated waste and the conversion of waste into valuable resources. In addition, we have built a second recycling center in line with the expansion of the plant in November, 2018

### Example of the Effective Use of Resources

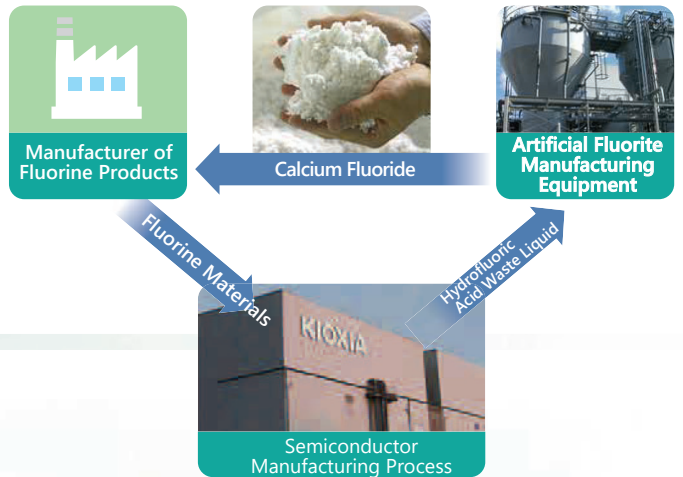
Waste hydrofluoric acid generated in the manufacturing process is treated in the artificial fluorite manufacturing facility and recovered as calcium fluoride (artificial fluorite). As a result, we have reduced the amount of sludge containing hydrofluoric acid by about 30%. The recovered calcium fluoride (artificial fluorite) is used by fluorine product manufacturers as a fluorine-based products. Through these efforts, we are helping to reduce the use of fluorite, which is a natural resource.



Recycling Building No. 2



METI Minister's Award 2014 for Resources Recirculation Technologies and Systems



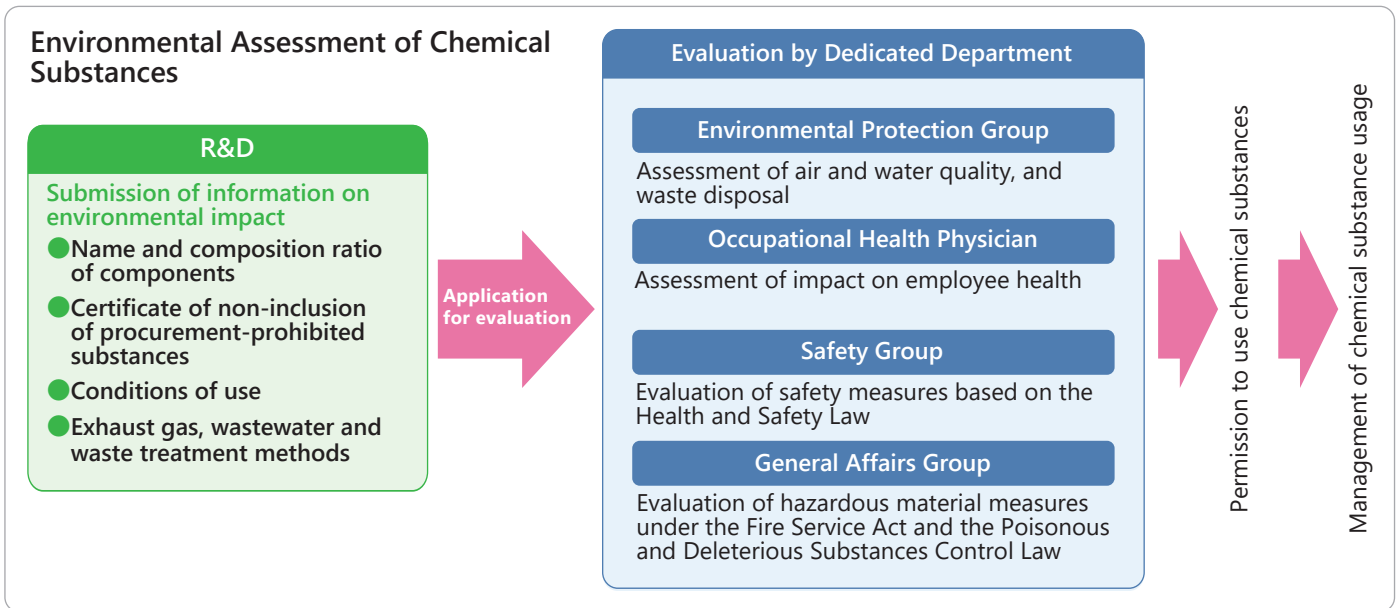


## Management of Chemical Substances

We manage chemical substances based on the principles of "using as few chemical substances as possible," "striving to reduce or substitute chemical substances whenever possible," and "managing chemical substances appropriately when they are used."

Before starting the use of new chemical substances, we conduct environmental assessments to confirm whether or not

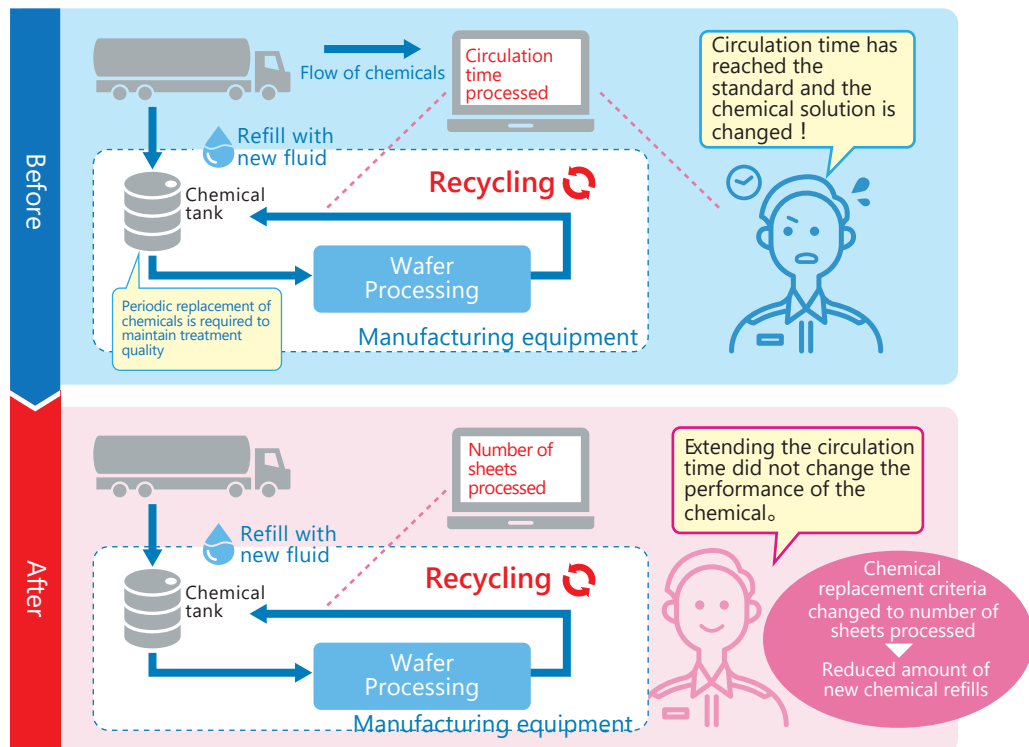
they contain any of the regulated substances specified by our company and how to properly dispose of them, in order to reduce the environmental impact. After starting the use of new chemical substances, we use an online totaling system to manage changes in the amount used every month.



## Reduction of Chemical Substances

### Example of reduced chemical substance emissions

In order to effectively reduce or replace the use of chemical substances, we evaluate the existence of laws and regulations and the risks involved in case of leakage, and identify chemical substances for which we should focus on implementing measures to reduce environmental impact. By reviewing the replacement conditions of buffered hydrofluoric acid used in circulation, the amount of chemicals used was reduced by approximately 2%. We will continue to develop technologies with the 3Rs (Reduce, Reuse and Recycle) in mind to reduce environmental impact.





## Management of Chemical Substances in Products



Regulations on chemical substances in products are being tightened every year. In addition to the EU's RoHS Directive, the Packaging Materials Directive and the REACH Regulation have been enforced. Outside the EU, laws and regulations similar to the EU's RoHS Directive are in place in countries around the world. In order to comply with these regulations, "prohibited substances" and "controlled substances" are selected and substances that must not be included in products or must be controlled are defined.

We conduct product environmental assessments at the product development stage to check information on new raw materials and chemical substances contained in our products. Through these efforts, we are striving to select materials with lower environmental impact to minimize the use of hazardous substances in our products and manufacturing processes to the extent possible.

Category	Definition
<b>Procurement-Prohibited Substances<sup>*1</sup></b>	"Procurement-Prohibited Substances" mean group of substances that are prohibited to be included in Deliverables procured by KIOXIA. Except for the exempted applications specified in the guidelines, no intentional addition shall be approved to deliverables of any applications. If there is a restrict value, the impurity concentration must be less than the restrict value. If there is a restrict value, the impurity concentration must be less than the Restrict Value. Notwithstanding the above, intentional addition and the impurity concentration must be less than the Restrict Value for the applications where the prohibition of intentional addition is not specified in the regulations.
<b>Procurement-Controlled Substances<sup>*2</sup></b>	"Procurement-Controlled Substances" mean group substances that is subject to control for contain/inclusion in deliverables procured by KIOXIA. Unlike procurement-prohibited substances, procurement-controlled substances do not restrict intentional addition in deliverables, and instead refer to substances for which the presence/absence and concentration value should be fully grasped. Suppliers are required to disclose information on the presence/absence and concentration values of substances that correspond to procurement-controlled substances that were intentionally added to deliverables or included as known impurities.

- \*1 Lead and its compounds, Mercury and its compounds, Cadmium and its compounds, Hexavalent Chromium compounds, Polybrominated Biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs including DecaBDE), Specific Substances of Phthalic acid esters, Asbestos, Certain Azo dyes and Azo pigment that may generate certain Amines, Ozone depleting substances (CFCs, HCFCs, HBFCs, carbon tetrachloride, etc.), Polychlorinated Biphenyls (PCBs), and Polychlorinated Terphenyls (PCTs), Polychlorinated naphthalene (with 2 or more chlorine atoms), Radioactive substances, Short-chained Paraffin Chloride (Carbon chain length 10-13), Tributyltin (TBT), Triphenyltin (TPT), and other substances in the 65 categories specified by KIOXIA.
- \*2 Antimony and its compounds, Arsenic and its compounds, Beryllium and its compounds, Bismuth and its compounds, Polycyclic Aromatic Hydrocarbons (PAHs), Bromine and its compounds, Nickel and its compounds, Bismuth and its compounds, Selenium and its compounds, Zinc and its compounds, Chlorinated paraffin, Trivalent Chromium compounds, Cobalt and its compounds, Cyanogen and its compounds, Perfluorocarbons (PFC), Hydrofluorocarbons (HFC), Chlorine and its compounds, Manganese and its compounds, Organic tin compounds, Sulfur hexafluoride (SF6), PFASs, and other substances in the 28 categories specified by KIOXIA.

## Green Procurement



As stated in the KIOXIA Group Environmental Policy, we have established a Green Procurement Working Group under the auspices of our Environment, Quality Control, and Procurement divisions, to work on green procurement, with the aim of contributing to the realization of a sustainable society. We have also formulated Green Procurement Guidelines, which outline our management standards and contain specific requirements for suppliers regarding the selection of materials with a low environmental impact and the management of chemical substances. We periodically update the guidelines to reflect issues such as changes in the laws and regulations of individual countries or regions, or customer requests.

We also conduct a thorough assessment of the environmental impact of chemical substances from the design and development stage, and use materials with a low environmental impact as part of our efforts to reduce our environmental footprint.

Through these initiatives, we will continue to share issues and collaborate with our suppliers on issues affecting environmental conservation, aiming to contribute to the realization of a better global environment.



Green Procurement Guideline

### Promotion of environmental protections by our suppliers

KIOXIA asks our suppliers to take proactive measures to protect the environment. We prioritize companies that take a proactive approach to environmental protections in procurement. KIOXIA asks all of our suppliers to establish management systems for environmental protections, including the management of chemical substances contained in products. We recommend the acquisition of ISO14001 and ISO9001 certification as the international standards.

### Management of chemical substances contained in Deliverables

For any items delivered to KIOXIA ("Deliverables"), in order to manage contained chemical substances, we ask for the through implementation of the following:

1. Establishment of management system for chemical substances contained in Deliverables
2. Green procurement of parts and materials with low environmental impacts, such as reducing hazardous chemical substances
3. Measures to prevent the transfer and transition of chemical substances to Deliverables through contact and so on
4. Responses to various surveys requested by KIOXIA, including surveys on chemical substances content

# Environmental Management System

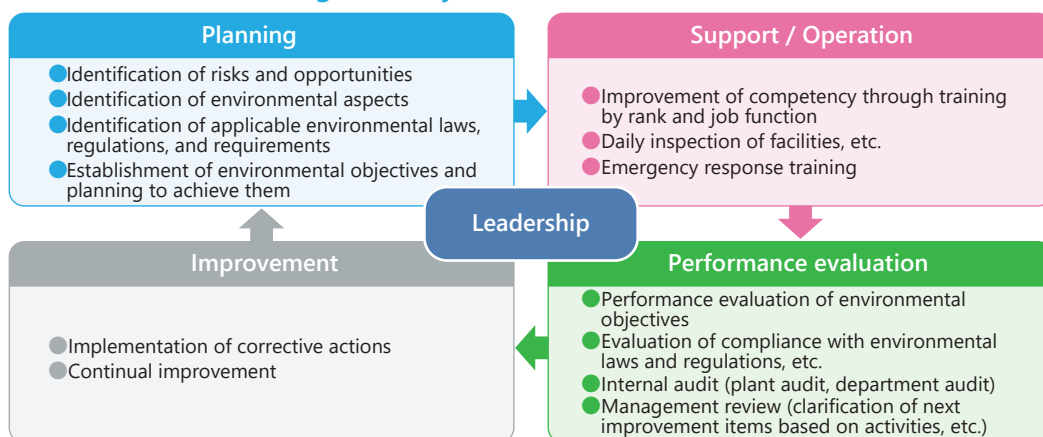
## ISO14001



Our plant has established an environmental management system (EMS) in accordance with the international standard ISO 14001 and is committed to continuous improvement and upgrading. We evaluate the environmental impact of our business activities, products and services, including the impact on the environment, including biodiversity, and develop proactive environmental measures by setting environmental objectives and targets related to reducing the environmental impact, preventing pollution, and

creating products with reduced environmental impact. In 2021, we promoted the reduction of environmental impact in our business activities (reduction of environmental impact associated with the construction and start-up of the fab7 and promotion of carbon neutrality). In addition, we have promoted the SDGs among our employees through food drives, beach cleanups, and other activities.

### Environmental Management System



ISO 14001 Certificate of Registration

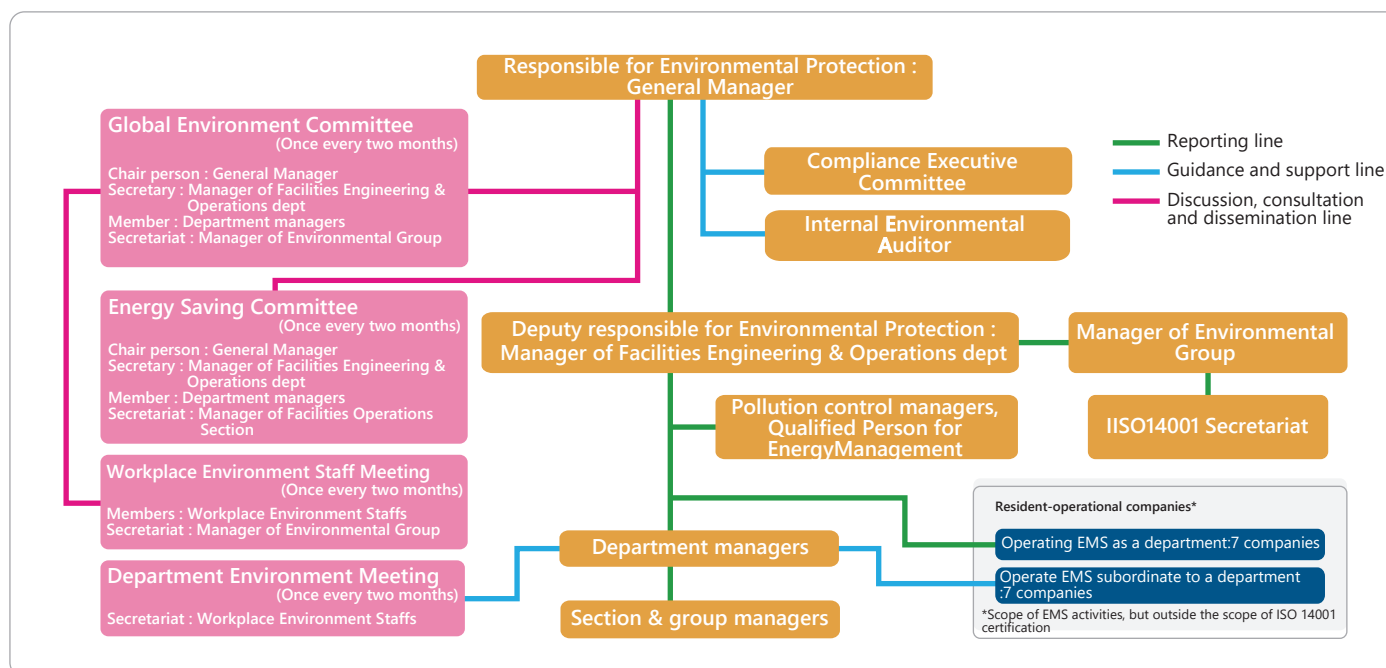
## Environmental Protection Structure



In order to promote environmental protection activities continuously and effectively, we have established an environmental protection system headed by the general manager to clearly define responsibilities and authority, and have established the Global Environment Committee as the highest deliberative body for environmental protection, where EMS, environmental objectives, and implementation plans are

discussed. We have also established a Compliance Executive Committee to oversee compliance with laws and regulations. In addition, all employees, including those who work on site, are actively involved in activities to reduce the environmental impact of our business activities and contribute to society through the environment.

### Our Plant's Environmental Protection System







## Environmental Target

Every year, we set environmental targets by reflecting the results of our environmental impact assessment on our progress and performance in achieving the previous year's environmental goals, our performance, our requirements for

our plant, and changes in environmental conditions. In 2021, we refrained from some events to prevent the spread of the new coronavirus. but for other plans, we were able to achieve our goals through various measures.

### Environmental Target and Results in 2021

No	Environmental objective	Environmental target	Target	Result
1	Creating products that consider environmental impact and providing them to society	Creating products that consider environmental impact by nanofabrication process	Three measures/year	3 measures/year
2	Preventing global warming	Reducing energy-derived CO <sub>2</sub> (The amount of reduction due to measures)	18,175 t-CO <sub>2</sub> /year or more	19,291 t-CO <sub>2</sub>
3		Improving the intensity* of greenhouse gas emissions (2017 Basis)	78.2% or less	66.0%
4	Efficient use of resources	Improving the intensity* of total waste generation (including valuable materials) (2017 Basis)	61.4% or less	55.3%
5		Improving the intensity* of industrial waste (2017 Basis)	70.4% or less	60.8%
6		Improving the intensity* of water received (2017 Basis)	56.3% or less	53.3%
7	Reducing environmental risks	Improving the intensity* of chemical emissions (2017 Basis)	39.3% or less	34.0%
8	On-site greening	Creating a healing space for employees and improving the image of our company to customers and others (planting of flower beds in each building)	Year-round	Year-round implementation (replanting, maintenance)
9	Promoting social contribution activities and environmental communication	Exhibiting at external environmental events	Three cases	-Environmental Learning and Information Center Seasonal Exhibit (May-July 2021) -Messe Nagoya (November 2021) -Virtual Yokkaichi Environmental Fair (February 2022)
10		Holding environmental liaison meetings with the local community association	Once	Submission of environmental report materials (December 2021)
11		Publication of environmental reports	-Japanese version (August 2021) -English version (December 2021)	-Japanese version (August 2021) -English version (December 2021)
12		Environmental Education for Children (Yokkaichi Pollution and Environmental Museum, neighboring elementary schools)	2 places	2 places
13		Food drive (Support for families living in poverty)	Once	736 pcs
14		Collection of disposable contact lens cases (Support for corneal transplant awareness and dissemination)	Year-round	36,938 pcs
15		Collection of down products (Support for Social Contribution Activities in Yokkaichi City and Asahi Town)	Year-round	Down: 4 pcs
16		Collection of used stamps (Agricultural support in India and Indonesia)	Year-round	5,741 pcs
17		Collection of miswritten postcards (Supporting Education in Developing Countries)	Year-round	167pcs (equivalent to 8,348yen)
18		Charity eco bazaar (Support for greening by Yokkaichi City)	Once	Canceled due to corona disaster
19		Collection of plastic bottle caps (Supporting Polio Prevention in Developing Countries)	Year-round	323,000 pcs (equivalent to 647 vaccines)
20		Collection of surplus calendars and notebooks (For use in nursing homes, kindergartens and nurseries, etc.)	Once	1,253 calendars and 373 notebooks
21	Increasing environmental awareness	Environmental emphasis month (Environment Month, 3R Promotion Month, Energy Conservation Month)	Three times	Three times
22		Publication of the environmental information magazine "Eco Time".and "Energy-saving Wall Newspaper"	12 times	12 times
23	Biodiversity Conservation	Support for owl conservation activities (Mie Biodiversity Partnership Agreement)	Year-round	Agreement re-signed (May), Tripartite discussions (August), Donation (December), Observation (January 2022-)
24		Coastal Cleanup (Support for improvement of sea turtle spawning environment)	Twice	Voluntary refraining from participation due to spread of new coronavirus infection

\* For PFC, waste, water, and chemical substances, volume-based memory capacity is used as an indicator for basic-unit goals that allows appropriate assessment.



## Monitoring System



In order to preserve the environment of the atmosphere, rivers, and the sea, we have established voluntary control standards that are stricter than legal requirements. In addition, employees are stationed 24 hours a day to monitor the situation.

### Items subject to regulation

Nitrogen Oxides (NOx), Sulfur Oxides (SOx), Total Nitrogen (T-N), Total Phosphorus (T-P), Chemical Oxygen Demand (COD), Suspended Solids (SS), Fluorine (F), and Hydrogen Ion Index (pH) are automatically monitored continuously for 24 hours. Other items are monitored by sampling.

### Items not subject to regulation

To strengthen control, items not subject to regulation are also voluntarily monitored by sampling.

### Analysis Center

We have set up an analysis center in our plant, which analyzes about 41,000 items per year.



Automatic Wastewater Analyzer



Water Treatment Facility Monitoring System



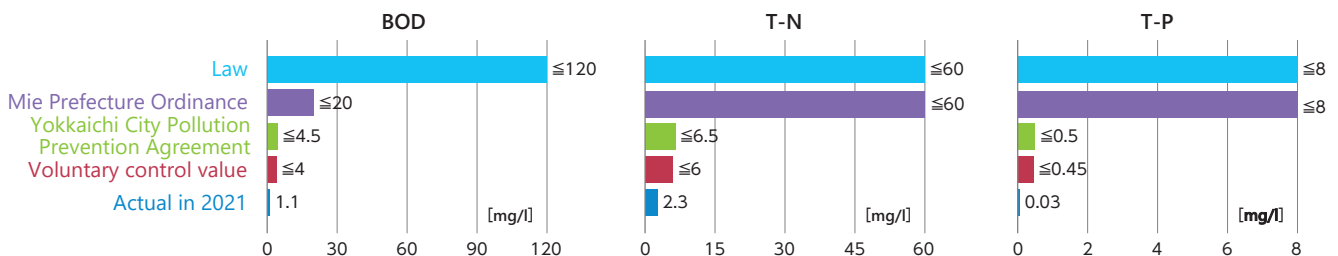
Analysis Center

## Air and Water Quality Management

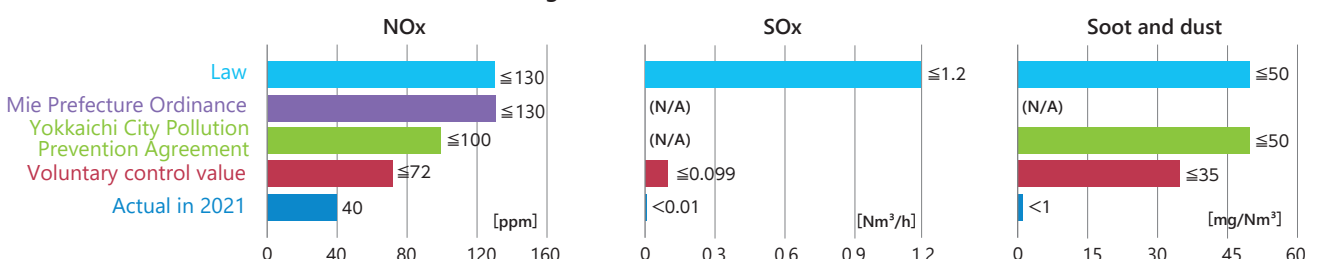


To ensure compliance with laws, ordinances, and agreements, we have established voluntary control standards, and monitor the situation on a daily basis. Below is the status of drainage (BOD, T-N, T-P) and exhaust gas (NOx, SOx, Soot and dust) management.

### Drainage into river (actual measured value: 2021 average value)



### Exhaust Gas (actual measured value: 2021 average value)





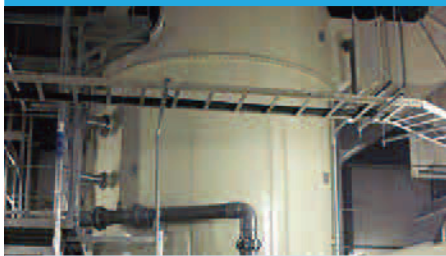
## Environment-related Facilities



In order to prevent contamination by chemical substances and reduce contamination risk, KIOXIA has established its Structural Design Guidelines to reduce the risk of a leak of chemicals at environment-related facilities.

### Examples

#### Waste gas scrubber



Structures and specifications for stable processing

#### Overhead piping



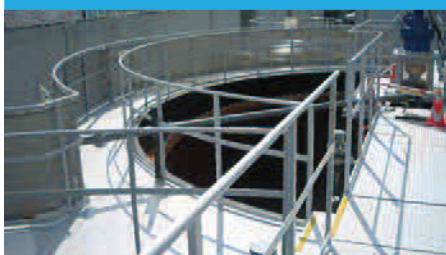
Reducing soil contamination risks

#### Drainage dike



Preventing wastewater from discharging into under or public water areas

#### Wastewater treatment



Stable processing system and preventing outflow of wastewater

#### Double joints in piping



Monitoring and preventing liquid leakages

#### Six-sided inspection



Seismic structure to store safely, Drainage dike, Oil level alarm

## Emergency Response Training



We use a variety of chemicals in our plant. We have selected equipment and operations with high environmental risks that may be subject to emergencies due to breakdowns of the equipment that handles them or natural disasters, and we have standardized all of our response procedures.

In 2021, a total of 19 training sessions were conducted with a total of 348 employees participating, including those of the company stationed on the premises. After the training sessions, the effectiveness of the response methods was confirmed and response procedures were improved as necessary.



Response training for a chemical leak

## Compliance with Laws and Regulations



In addition to clarifying the environmental laws, regulations, and other requirements that apply to our plant, we also check for compliance with applicable laws and regulations in the procurement of manufacturing and power equipment to ensure that we do not fail to comply with the laws and regulations.

### Centralized Management of Laws and Regulations

We regularly check the content of legal amendments to ensure that we are up-to-date with constantly changing environmental laws and regulations. The content of the legal amendments applicable to our plant is incorporated into the "Legal Registration List and Compliance Evaluation Table" for centralized management.

### Compliance Assessment

Each year we evaluate compliance with the environmental laws and regulations applicable to our plant. In 2021, we had no problems with all legal requirements.

### Compliance Checks on Equipment Investment and Procurement

At the time of equipment investment and procurement, all 10 laws and regulations, including the Water Pollution Control Act and county ordinances, are checked for compliance. For facilities that are subject to the laws and regulations, notification is made as necessary.

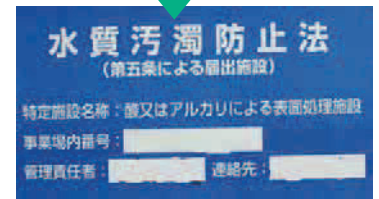
### Visualization of Compliance Management

Stickers indicating the relevant laws and regulations are placed on the subject equipment to ensure the visualization of legal management.



System for conformity

Check for compliance before procuring equipment.



Visualization of Compliance Management with Stickers

## FAQ

**Q Smoke from the building roof ?**

**A** The air discharged from the cooling tower is cooled by the outside air and turns into water vapor that appears white.



Cooling Tower



## Measurement Data on the Environment

### Atmospheric Measurement Results

	Regulatory value	Voluntary control value	Measured value	Measurement frequency
NOx (ppm)	130 or less *	72 or less	40	Once per year
SOx (Nm <sup>3</sup> /h)	1.2 or less *	0.099 or less	<0.01	Once per year
Soot and dust (mg/m <sup>3</sup> )	50 or less *	35 or less	1	Twice per year

\* Air Pollution Control Act

Measured values are averages for FY2021

### Drainage measurement results (No.1 drainage outlet: river)

	Regulatory value	Voluntary control value	Measured value	Measurement frequency
pH	5.8-8.6 * <sup>1</sup>	6.5-8.0	7.2-7.8	Once per month
BOD (mg/l)	20 or less * <sup>1</sup>	4.0 or less	1.1	Once per month
COD (mg/l)	20 or less * <sup>1</sup>	4.0 or less	3.1	Once per week
SS (mg/l)	70 or less * <sup>1</sup>	3 or less	<1	Once per month
Nitrogen (mg/l)	60 or less * <sup>2</sup>	6.0 or less	2.3	Once per week
Phosphorus (mg/l)	8 or less * <sup>2</sup>	0.45 or less	0.03	Once per month
Fluorine (mg/l)	8 or less * <sup>2</sup>	4.5 or less	1.8	Once per week

\*<sup>1</sup> Mie Prefectural Ordinance for Living Environment Conservation

Measured values are averages for FY2021

\*<sup>2</sup> Water Pollution Prevention Act

### Drainage measurement results (No.2 drainage outlet: sea area)

	Regulatory value	Voluntary control value	Measured value	Measurement frequency
pH	5.0-9.0 *	6.5-8.0	6.7-8.0	Once per month
COD (mg/l)	120 or less *	10 or less	5.0	Once per week
SS (mg/l)	150 or less *	8 or less	1	Once per month
Nitrogen (mg/l)	60 or less *	15 or less	2.6	Once per week
Phosphorus (mg/l)	8 or less *	1 or less	0.20	Once per month
Fluorine (mg/l)	15 or less *	12 or less	4.5	Once per week

\* Air Pollution Control Act

Measured values are averages for FY2021

### Sound Noise and Vibration Measurement Results (West Area)

	Measurement location: Time	Regulatory value	Voluntary control value	Measured value	Measurement frequency
Sound noise (dB)	Site boundaries: morning and evening	N/A	55 or less *	53	Four times per year
	Site boundaries: Daytime	N/A	60 or less *	54	Four times per year
	Site boundaries: Night	M/A	55 or less *	54	Four times per year
Vibration (dB)	Site boundaries: Daytime	N/A	50 or less *	<30	Once per year
	Site boundaries: Night	N/A	50 or less *	<30	Once per year

\* For the West Area and East Area regulation values, the strictest regulation value and the actual measurement value are shown because the applicable regulation value differs depending on the point

### Sound Noise and Vibration Measurement Results (East Area)

	Measurement location: Time	Regulatory value	Voluntary control value	Measured value	Measurement frequency
Sound noise (dB)	Site boundaries: morning and evening	50 or less *	—	44	Four times per year
	Site boundaries: Daytime	55 or less *	—	49	Four times per year
	Site boundaries: Night	45 or less *	—	44	Four times per year
Vibration (dB)	Site boundaries: Daytime	60 or less *	—	<30	Once per year
	Site boundaries: Night	55 or less *	—	<30	Once per year

\* Mie Prefectural Ordinance for Living Environment Conservation

## Material Balance

### Input

		2017	2018	2019	2020	2021
Chemicals *	t	44,974	47,661	47,173	53,905	55,262
City Water	Thousands of m <sup>3</sup>	60	78	30	22	31
Industrial Water	Thousands of m <sup>3</sup>	16,879	19,463	19,766	21,076	21,485

\* Substances to be reduced as specified by the KIOXIA Group

### Output

		2017	2018	2019	2020	2021
Greenhouse gas	Thousands of t-CO <sub>2</sub>	1,615	2,073	2,136	2,205	2,150
Chemicals *	t	687	653	518	586	562
Waste	t	70,075	80,203	81,211	90,161	93,636
Drainage	Thousands of m <sup>3</sup>	13,590	14,777	14,733	15,857	16,191
NOx	t	22	28	27	25	23
SOx	t	0	0	0	0	0

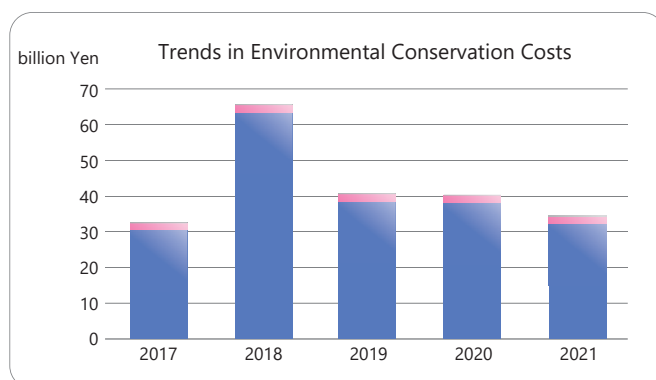
\* Substances to be reduced as specified by the KIOXIA Group

## Environmental Accounting

Every year we record the cost of measures to reduce the environmental impact in accordance with the "Environmental Accounting Guidelines 2005" set by the Ministry of the Environment.

In 2018, we invested heavily in environmental measures at the fab 6. In 2021, we invested approximately 34.5 billion yen for environmental protection, including the installation of an exhaust gas abatement treatment facility. In 2022, we expect to increase investment for environmental measures at the fab 7.

<span style="color: grey;">■</span>	Other Costs (green procurement, ISO14001 operations, and environmental education)
<span style="color: pink;">■</span>	Costs of resource utilization and waste reduction
<span style="color: blue;">■</span>	Costs of pollution protection (air and water)



## Law concerning Pollutant Release and Transfer Register (PRTR)

The PRTR Law of Japan mandates a system to monitor the amounts of chemical substances released to the environment (air, water area or soil), the amounts transferred, etc., and to aggregate the results and disclose data to the public. This law, the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof, requires

reporting of the amounts released and transferred if the amount handled of a Class I Designated Chemical Substance per year is 1 ton or more (0.5 ton or more for a Specified Class I Designated Chemical Substance).

KIOXIA Group voluntarily discloses the amounts handled, consumed, removed and recycled in addition to the amounts released and transferred for each Class I Designated Chemical Substance.

### 2021 PRTR Substance Data

Substance number	Chemical substance name	Amount handled	Amount released					Amount transferred			Amount consumed <sup>1</sup>	Amount removed <sup>2</sup>	Amount recycled <sup>3</sup>
			Air	Public water	Soil	Landfill	Total amount	Waste	Sewerage	Total amount			
1	Zinc compounds (water-soluble)	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42	0.00
272	Copper salts(water-soluble, except complex salts)	3.95	0.00	0.00	0.00	0.00	0.00	3.95	0.00	3.95	0.00	0.00	0.00
302	Naphthalene	4.70	0.02	0.00	0.00	0.00	0.02	4.67	0.00	4.67	0.00	0.00	0.00
374	Hydrogen fluoride and its water-soluble salts	6567.46	2.01	0.00	0.00	0.00	2.01	123.84	0.00	123.84	0.00	4574.33	1867.29
395	Water-soluble salts of peroxodisulfuric acid	39.43	0.00	0.00	0.00	0.00	0.00	0.79	0.00	0.79	0.00	38.64	0.00
405	boron compounds	1.33	0.00	0.00	0.00	0.00	0.00	1.33	0.00	1.33	0.00	0.00	0.00
438	Methylnaphthalene	10.40	0.05	0.00	0.00	0.00	0.05	10.36	0.00	10.36	0.00	0.00	0.00

Note: Amounts released, amounts transferred, amounts consumed, amounts removed, amounts recycled, and amounts handled are rounded to the third decimal place for fractional treatment, so the sum of amounts released, amounts transferred, amounts consumed, amounts removed, amounts recycled may not equal the amount handled.

<sup>1</sup> Amount consumed is the amount of a substance used in or associated with a product and shipped out of the Operations.

<sup>2</sup> Amount removed is the amount of a substance transformed into other substances by neutralization, decomposition or reaction treatment performed at the Operations.

<sup>3</sup> Difference between the amount of waste transferred and the amount recycled depends on whether waste is processed with charge or without charge. When waste disposal is outsourced with charge even for recycling purposes, the amount is considered as the amount of waste transferred. d as the amount of waste transferred.



## History of the Yokkaichi Plant

Plant History	Year	Product History
	1987	Invented the world's first NAND Flash memory
	1991	Commercialized the world's first 4Mbit NAND Flash memory
Constructed Yokkaichi Plant	1992	
Commenced operation of Fab 1	1993	
Commenced operation of Fab 2	1996	
	2000	Commercialized SD memory cards
Commenced operation of Fab 3	2005	
Commenced operation of Fab 4	2007	Announced the world's first 3D Flash memory technology

Plant History	Year	Product History
Commenced operation of Fab 5 (Phase 1)	2011	
Commenced operation of Fab 5 (Phase 2)	2014	Commercialized the world's first 15nm NAND Flash memory
	2015	Commercialized a 48-layer BiCS FLASH™ 3D Flash memory with the world's highest density
Commenced operation of New Fab 2	2016	Created a prototype of a 64-layer BiCS FLASH™ 3D Flash memory with the world's highest density
	2017	Prototyped a 96-layer BiCS FLASH™ 3D Flash memory
Commenced operation of Fab 6	2018	Inaugurated the Memory Development Center
	2019	Developed XL-FLASH, a storage-class memory
Commenced operation of Fab 7	2022	

## History of Environmental Activities

1990	<ul style="list-style-type: none"> <li>Concluded pollution control agreement with Yokkaichi City, Mie Prefecture</li> </ul>
1991	<ul style="list-style-type: none"> <li>Concluded pollution control agreement with Yamanoissiki-cho, Yokkaichi City</li> <li>Started holding Yamanoissiki-cho local meetings</li> </ul>
1996	<ul style="list-style-type: none"> <li>Gained BS7750 environmental management system certification</li> <li>Gained ISO14001:1996 environmental management system certification</li> </ul>
1999	<ul style="list-style-type: none"> <li>Received the prize of Recycling Promotion Council</li> </ul>
2000	<ul style="list-style-type: none"> <li>Received the Chubu Ministry of Economy, Trade, and Industry Minister's Award (heat category)</li> <li>Received the prize of the Chairman of Energy Conservation Center, Japan</li> </ul>
2001	<ul style="list-style-type: none"> <li>Received the Chubu METI Minister's Award (electricity category, contribution to energy management)</li> </ul>
2003	<ul style="list-style-type: none"> <li>Received the Director-General, Agency for Natural Resources and Energy Award (heat category)</li> <li>Started publishing Yokkaichi Plant's environmental report</li> </ul>
2004	<ul style="list-style-type: none"> <li>Received the Director-General, Agency for Natural Resources and Energy Award (electricity category)</li> </ul>
2005	<ul style="list-style-type: none"> <li>Gained ISO14001:2004 environmental management system certification</li> </ul>
2006	<ul style="list-style-type: none"> <li>Received Energy Saving Center's Award for outstanding performance at conference of successful cases of energy saving</li> </ul>
2007	<ul style="list-style-type: none"> <li>Started Kid's ISO14000 program (environmental education for children)</li> <li>Gained ISO14001:2004 integrated environmental management system certification</li> </ul>
2008	<ul style="list-style-type: none"> <li>Received the PRTR Outstanding Performance Award (Jury's Special Award)</li> </ul>
2009	<ul style="list-style-type: none"> <li>Started Kid's Yokkaichi CO2 diet program (environmental education for children)</li> <li>Received the Gold Boiler Management Establishment Award</li> </ul>
2010	<ul style="list-style-type: none"> <li>Received the Encouraging Prize of Kansai Eco-Office Grand Award</li> <li>Started the Eco-kid's CO2 diet program (environmental education for children)</li> </ul>
2011	<ul style="list-style-type: none"> <li>Received the Technology Prize in the 49th All Japan Boiler Conference</li> </ul>
2012	<ul style="list-style-type: none"> <li>Received the Prize of the Chairman of ECCJ of Energy Conservation Group Prize</li> <li>Received the Prize of the Chairman of the 3R's (Reduce, Reuse, Recycle) promoter Prize</li> <li>Received the silver prize in an international section of Green Apple Award</li> </ul>
2013	<ul style="list-style-type: none"> <li>Received the Chubu METI Director's Award (energy management)</li> <li>Received the Prize of the Manager of Tokai branch office, ECCJ</li> <li>Received the Prize of the Chairman of the 3R's (Reduce, Reuse, Recycle) promoter Prize</li> <li>Received 1st place at 2nd Mie Environmental Awards</li> </ul>
2014	<ul style="list-style-type: none"> <li>Received the Prize of the Chairman of the 3R's (Reduce, Reuse, Recycle) promoter Prize</li> <li>Received the METI Minister's Awards for Resources Recirculation Technologies and Systems</li> </ul>
2015	<ul style="list-style-type: none"> <li>Received the Prize of the Manager of Tokai branch office ECCJ (Recognition of distinguished people in promoting energy saving)</li> </ul>
2016	<ul style="list-style-type: none"> <li>Received the Prize of the Manager of Tokai branch office, ECCJ (Recognition of distinguished people in promoting energy saving)</li> <li>Received the "Recognition of distinguished people of city greening" award</li> <li>Received the letter of appreciation at the 65th Mie prefecture social welfare convention</li> </ul>
2017	<ul style="list-style-type: none"> <li>Gained ISO14001:2015 environmental management system certification</li> <li>Received the Prize of the Manager of Tokai branch office, ECCJ (Recognition of distinguished people in promoting energy saving)</li> </ul>
2018	<ul style="list-style-type: none"> <li>Received the "Achievement Award" from NPO "Re lifestyle" (Collecting PET bottle caps)</li> <li>Starting an environment class at the Yokkaichi Pollution and Environmental Future Museum</li> <li>Received the Prize of the Manager of Tokai branch office, ECCJ (Recognition of distinguished people in promoting energy saving)</li> </ul>
2019	<ul style="list-style-type: none"> <li>Received the Yokkaichi City Environmental Activity Award</li> <li>Received the Prize of the Manager of Tokai branch office, ECCJ (Recognition of distinguished people in promoting energy saving)</li> </ul>
2020	<ul style="list-style-type: none"> <li>Received the "Recognition of distinguished people of city greening" award</li> <li>Received "Climate Change Action Minister of the Environment Award"</li> <li>Received the Prize of the Manager of Tokai branch office, ECCJ (Recognition of distinguished people in promoting energy saving)</li> </ul>
2021	<ul style="list-style-type: none"> <li>Received a letter of appreciation from the Yokkaichi City Council of Social Welfare (for 4 food drives, etc.)</li> <li>Received the Prize of the Manager of Tokai branch office, ECCJ (Recognition of distinguished people in promoting energy saving)</li> <li>Received a letter of appreciation from the Japan Association for UNESCO (UNESCO World Terakoya Movement)</li> </ul>

## Editorial Policy

The purpose of this report is to help you further understand the environmental management of KIOXIA Corporation's Yokkaichi Plant (environmental management, reduction of environmental impact in business activities, etc.).

This report has been edited with reference to the Environmental Reporting Guidelines 2018 issued by the Ministry of the Environment.

### ■ Period covered by the report description

The activity performance data focuses on activities for fiscal year 2021 (April 1, 2021 - March 31, 2022), but includes some earlier or 2022 activities.

### ■ Target Organizations

Yokkaichi Plant\* and Asahi Test Center, KIOXIA Corporation

\* Including representative divisions and companies

Environmental information is available on our website.

#### Kioxia Group Sustainability

<https://www.kioxia-holdings.com/en-jp/sustainability.html>



#### Yokkaichi Plant Environmental Initiatives

<https://www.kioxia.com/en-jp/about/yokkaichi/environment.html>



## KIOXIA Corporation

Environmental Protection Group

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