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RICOH Group
Circular Economy Report 2023

Editorial Policy

The "Ricoh Group Circular Economy Report 2023" refers to the "Disclosure and Engagement Guidance to Accelerate Sustainable Finance for a Circular Economy" issued by METI (Ministry of Economy, Trade and Industry of Japan) and MOE (Ministry of the Environment) in January 2021. We are reporting on our efforts toward a circular economy. The circular economy is an important initiative that contributes to action towards the climate change and biodiversity conservation. In this report, we will introduce examples of how circular economy initiatives lead to reductions in CO_2 emissions. Through this report, we help stakeholders understand the Group's activities, communicate with the stakeholders, acquire new knowledge, and will publish an even more comprehensive report.

Date of Publishing

October 2023
(published as an annual report)

Reporting period

FY2022 (April 1, 2022 - March 31, 2023)
*In some cases, information at the time of publication is included.

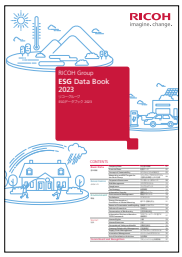
Scope of coverage

Ricoh Co., Ltd. and its 240 consolidated subsidiaries (The Ricoh Group (Global))
Organizations covered by the data are specified in tables or graph.

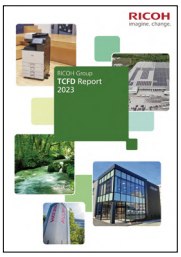
Related Links

Ricoh Group Integrated Report

ESG Data Book 2023



TCFD Report 2023



Ricoh Group Sustainability Website

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1. Message from the CEO

Representative Director,
President and CEO
Akira Oyama

The Ricoh Group remains unchanged in its esteem for the Spirit of Three Loves. We make our founding principles of "Love your neighbor, love your country, love your work" the starting points for our corporate activities, and put these principles into practice. The "love your country" component of the Spirit of Three Loves is derived from the fact that our founder, Kiyoshi Ichimura, launched the business to contribute to the reconstruction of postwar Japan. Reworking this for present times, "country" becomes the earth as a whole, and the thought can be interpreted as "love the earth." To hand down the earth to the next generation and onward, we see our Mission Statement as putting into practice the things that should be done now. The preservation of a sound global environment is a requirement for achieving the advancement of companies and society.

The Ricoh Group is tackling this issue today, making the sustainable enhancement of our corporate value through the resolution of social issues a foundation of our management while advancing our transformation into a group of digital services companies. We express our vision for a sustainable future world as "Three Ps Balance," a state in which the economy (Prosperity), society (People), and the environment (Planet) remain in balance. This way of thinking aligns with the concept of "Leave No One Behind," a principle espoused in the SDGs set by the United Nations. Based on "Three Ps Balance," we have identified seven materialities in the area of "resolving social issues through business" and in the area of "robust management structure". We have further set 16 company-wide ESG targets linked to those materialities.

In order to achieve our goal of "Three Ps Balance", above all, it is essential that society as a whole changes toward a Circular Economy. The Ricoh Group established the Comet Circle™ in 1994 as a concept for realizing a Circular Economy. Since then, we have continued to make effective use of resources throughout the product life cycle, including upstream and downstream processes in addition to the processes in the product manufacturer and distributor area. In order to further accelerate the transition to a Circular Economy, we have set "Circular Economy" as one of our material issues. We have set a challenging goal of reducing the Virgin material usage ratio for products in our products to 60% or less by 2030, and we are stepping up our efforts towards this.

With the business environment surrounding Ricoh, in the resource conservation field, it is necessary to address soaring resource prices, the proper disposal of used products, and the efficient use of resources at business sites. For this reason, the importance of the circular economy business model that we have been promoting is growing, and we are promoting measures that anticipate future management risks.

On the other hand, the promotion of circular economy business models creates great business opportunities. In February 2023, as one of our initiatives, we launched the "RICOH IM C6010/C5510/C4510/C3510/C3010/C2510/C2010" A3 Color Multifunction Printers that achieve the highest level of environmental performance in the industry. We have achieved an industry-leading*1 post-consumer recycled plastic usage rate of 50% or more in product bodies, and have reduced the carbon footprint*2 by approximately 27%*3 compared to previous models through thorough resource and energy conservation.

The Ricoh Group will work closely with our customers to help them work, and through the creation of new technologies and businesses in the digital domain, we will work together with our customers and ourselves to contribute to the realization of a circular economy.

*1 Current as of June 2023
In the A3 color multifunction printer registration information of the "EPEAT (Electronic Product Environmental Assessment Tool)" environmental evaluation system adopted by the US federal government as a procurement requirement. Ricoh research

*2 Carbon footprint is the amount of greenhouse gases emitted over the entire life cycle (from raw material procurement to disposal/recycling) converted to an amount of CO_2

*3 Calculation based on predecessor models (RICOH IM C6010 and RICOH IM C6000)

2. The Ricoh Group's sustainability policy

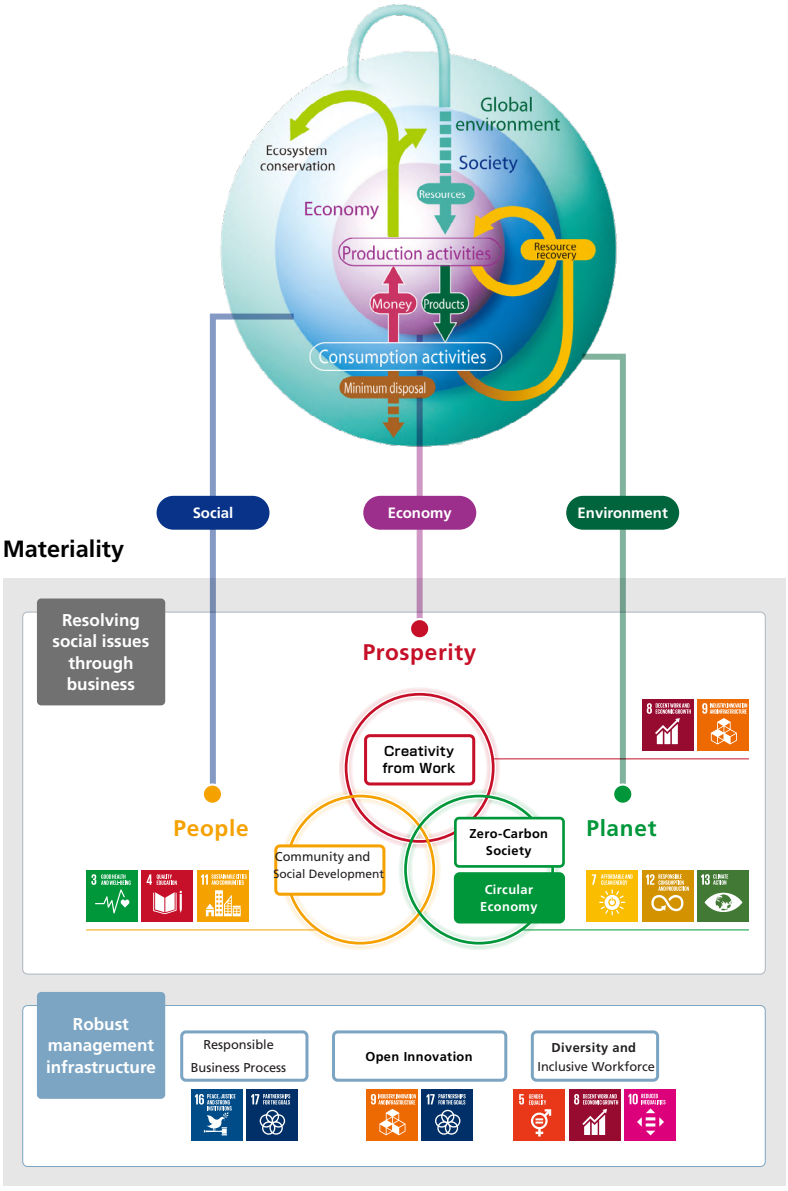
2-1 basic approach to sustainability management and our materiality

The Ricoh Group, based on the Founding Principles of "Love your neighbor", "Love your country", "Love your work" (The Spirit of Three Loves), regards its mission as "Empowering individuals to find Fulfillment through Work by understanding and transforming how people work so we can unleash their potential and creativity to realize a sustainable future."

The Ricoh Group pursues such sustainability through the Three Ps Balance: Prosperity (economic activities), People (society), and Planet (environment). We will endeavor to resolve social issues through business, reinforce our operational underpinnings, and contribute to society, and will help to reach Sustainable Development Goals (SDGs) agreed to by the global community.

When expressing the current state of the world based on the Three Ps Balance, it is evident that the economy and society are causing damage beyond the Earth's regenerative capacity (sustainability), posing a threat to the sustainability of both the economy and society. Within the Ricoh Group, we are identifying challenges and expectations from stakeholders while striving for the realization of a society that continues to develop while maintaining the balance of the three Ps. We identify materiality for the economy, society, and local environment as "Resolving social issues through business" and have set the achievement of Circular Economy as one of these objectives.

Three Ps Balance



2-2 ESG targets

We are actively engaged in ESG initiatives, considering them essential for generating future financial success. As part of our 21st Mid-Term Management Strategy(MTS), which commenced in the fiscal year 2023, we have established seven material issues and 16 company-wide ESG targets, focusing on two main perspectives: "Respond to Global ESG Trends" and the overarching strategy of "Transformation into a Digital Services Company."

Specifically, these targets encompass addressing global issues such as climate change and human rights concerns, as well as goals related to digital service transformation, including digital service-related patents, information security, and digital talent development. For realizing Circular Economy we are promoting the reduction of virgin material usage ratio in our products as one of our ESG target.

For more information on the achievements of our 20th Medium-Term Management Plan's ESG targets, please refer to the link below.
www.ricoh.com/-/Media/Ricoh/Sites/com/sustainability/materiality/pdf/fy2022_result.pdf

Resolving social issues through business

Materiality	Strategic Intent	2030 Targets	Focus Domains	21st MTS ESG Targets (End of fiscal 2025)	
Creativity from Work	To provide digital services that transform how customers work and help them with productivity improvement and value creation.	Contribute to "Creativity from Work" of all customers to whom we deliver value	• Office services • Printing industry digitalization • Thermal media • Industrial products • Smart Vision	(1) Customer survey scores*1	29%
Community and Social Development	To contribute to the maintenance, development, and efficiency of community and social systems. We leverage our technical expertise and customer connections to expand the areas where we provide value	Contribute to the enhancement of social infrastructure for 30 million people	• GEMBA • Biomedical • Municipal digitalization solutions • Educational ICT solutions	(2) Number of people to whom we have contributed by improving social infrastructure	15 million to 20 million people
Zero-Carbon Society	To decarbonize the entire value chain and create business opportunities by contributing to carbon neutrality	- Reduce Scope 1 and 2 GHG emissions by 63%, with 40% reductions for Scope 3 - Switch to 50% renewable electricity	• Environment and energy • Eco-friendly MFPs • Commercial and industrial printing • Silicone-top Linerless Labels linerless labels and label-free printing • PLAiR	(3) GHG Scope 1, 2 reduction rate (vs. 2015) (4) GHG Scope 3 reduction rate (vs. 2015) (5) Renewable energy utilization ratio for power consumption (6) Avoided emissions	50% 35% 40% 1.4 million metric tons
Circular Economy	To create business opportunities by building a circular economy business model for ourselves and our customers	Ensure efficient use of resources throughout the entire value chain and achieve 60% or less of virgin material usage ratio		(7) Virgin material usage ratio	80% or less

*1: Percentage of customers recognizing Ricoh as a digital services company.

Robust management infrastructure

Materiality	Strategic Intent	21st MTS ESG Targets (End of fiscal 2025)	
Responsible Business Process	To earn stakeholder trust by taking a holistic view of our supply chain and minimizing ESG risks in our business processes	(8) CHRB score*2 (9) Compliant with NIST SP800-171 coverage of company's core business environment (10) Low-compliance risk group companies	ICT sector top 80% or more 80% or more
Open Innovation	To shift from a self-sufficient approach to a new value creation process that creates businesses to quickly resolve social issues	(11) Contracted Joint R&D ratio (12) Digital service patent application ratio*3	25% 60%
Diverse and Inclusive Workforce	To foster a corporate culture where diverse employees can demonstrate their potential and transform themselves and the company into one that is resilient to change	(13) Ricoh Digital Skills Level 2 or above rated employees (Japan) (14) Process DX Silver Stage certified employee ratio*4 (15) Employee engagement scores*5 (16) Female-held managerial position ratio	4,000 people 40% Global: 3.91 Japan: 3.69 North America: 4.18 Latin America: 4.14 EMEA: 4.01 APAC: 4.15 Global: 20% (Japan: 10%)

*2: Corporate Human Rights Benchmark: An international human rights initiative that institutional investors and nongovernment organizations established. It assesses the human rights disclosures of around 250 global companies across the agricultural products, apparel, extractives, ICT manufacturing, and automotive manufacturing sectors. If not included in these assessments, scores are calculated through self-assessments, including third-party reviews

*3: Ratio of patent applications from businesses involved in digital services to Group total.

*4: Percentage of employees trained with process improvement based on process digitalization model experienced in process improvements taking digitalization process training (parameter is the total number of employees in business units targeted for such training)

*5: Based on Gallup Q12 Mean™

Linking ESG to executive compensation

The progress of ESG targets, including responses to realizing Circular Economy, is supervised at the management level and is enhanced in its effectiveness by being integrated into executive compensation.

Factoring ESG into bonus for directors and executive officers

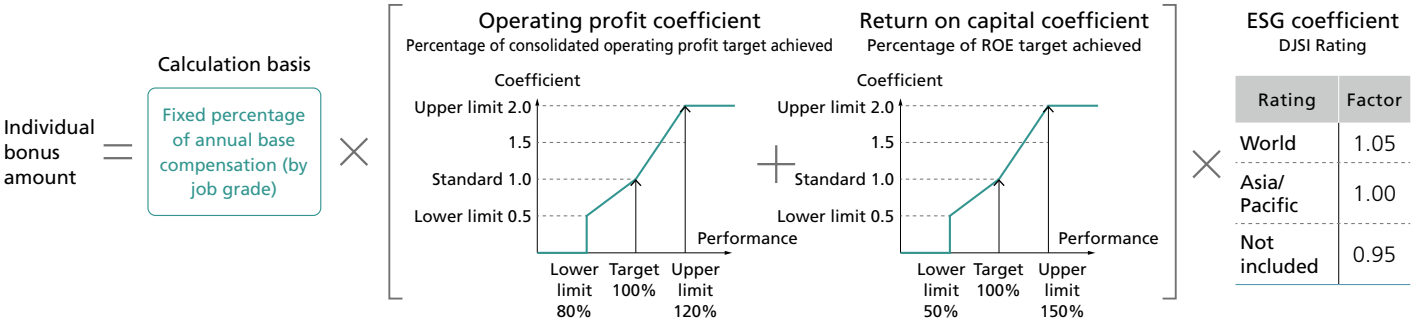
The annual Dow Jones Sustainability Indices Rating serves as a tool to confirm companywide ESG initiatives. We incorporate the rating in the bonus formulas for directors and executive officers to incentivize ESG initiatives. We strengthen business unit and Group headquarters commitments to achieving ESG targets by reflecting progress toward them in executive officers' assessments and compensations.

* Dow Jones Sustainability Indices: Dow Jones & Company of the United States and sustainability investment research firm S&P Global jointly developed these indices, analyzing corporate sustainability from economic, environmental, and social perspectives.

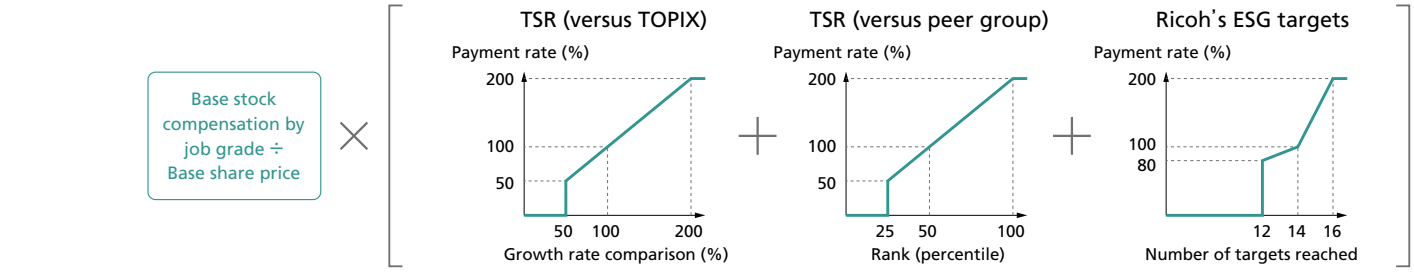
Factoring ESG into stock compensation for executives

From the 21st MTS, we reflect ESG targets in director stock compensation in addition to bonuses. We evaluate progress toward achieving 16 companywide ESG targets, this factor accounting for 20% of director stock compensation.

Bonus formula for Directors



Formula for performance-linked stock-bases compensation for Directors from fiscal 2023



2-3 ESG Promotion System

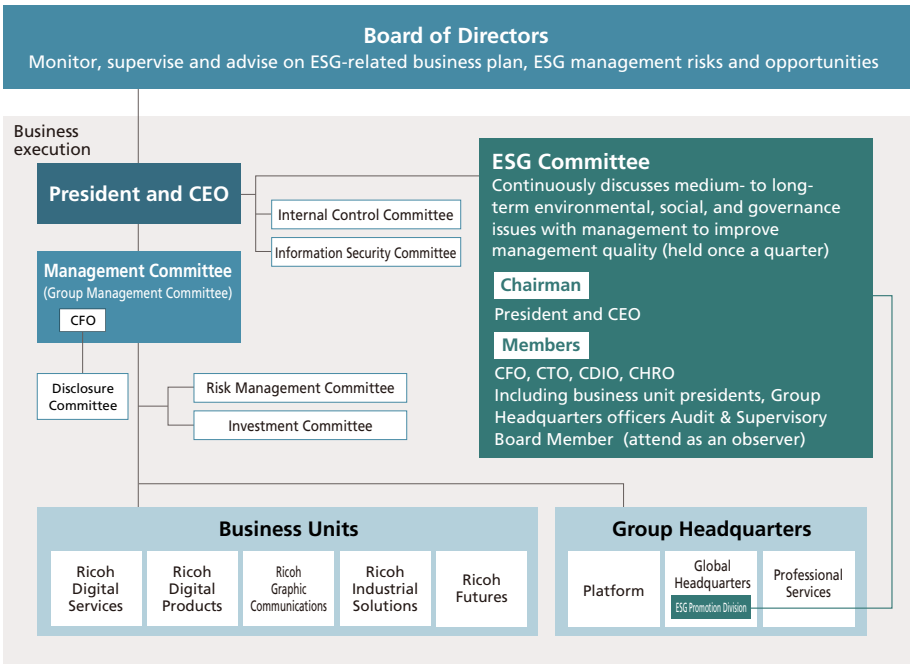
Sustainability promotion structure within the business strategy

We have established the ESG Committee for the purpose of continuously discussing environmental, social, and governance issues faced by the Ricoh Group at a management-level and leading the discussions to the quality enhancement of the entire Group. The committee is a decision-making organization that meets quarterly chaired by the CEO and consists of GMC* members including Internal Executive Director and business unit presidents.

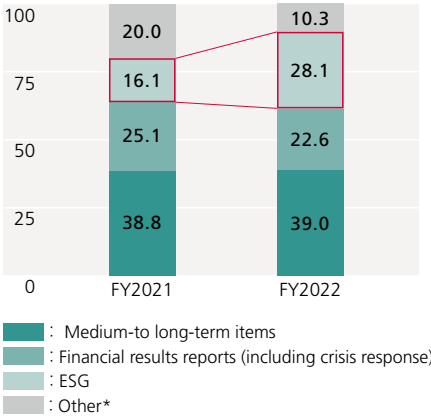
Within the Board of Directors, approximately 30% of the agenda is dedicated to discussions on ESG themes. ESG-related matters are positioned as crucial topics in the realm of management, and ongoing discussions are being held to advance their significance. Progress on ESG targets is overseen at the management level through the ESG Committee and the Board of Directors. The new material issues and ESG targets, which were set in conjunction with the 21st MTS starting in fiscal 2023, were also approved by the Board of Directors as indicators to be aimed for in tandem with the financial indicators.

* GMC: The Group Management Committee consists of executive officers and is a decision-making body empowered by the Board of Directors.

Sustainability promotion structure



Time allocation by agenda item at the Board of Directors (%)



*Resolutions in accordance with the provisions of the Companies Act, personnel matters, other individual proposals, etc.

Agenda of ESG committee in FY2022

FY2022		Agenda
First Meeting	May	· Report on the results of material ESG items and deliberation on draft disclosure for the convocation notice and the annual securities report · Deliberations on information security system proposals · Report on trends and points for enhancement in ESG activities
Second Meeting	August	· Roadmap of the Ricoh Group's decarbonization efforts and deliberations on measures · Ricoh Group Integrated Report, ESG-related media publication reports
Third Meeting	November	· Deliberations on renewable energy fiscal 2023 certificate budget and introduction of the 21st MTS · Deliberations on materiality/ESG targets revisions · Report on RBA* audit results
Fourth Meeting	February	· Planning deliberations on 2023 Ricoh Group Integrated Report · Report on 20th Mid-Term Management Plan ESG improvement activities and external assessment results · Report on changes in customer demands as seen from ESG benchmark and business talks in fiscal 2022 · Report on environmental appeal of new products

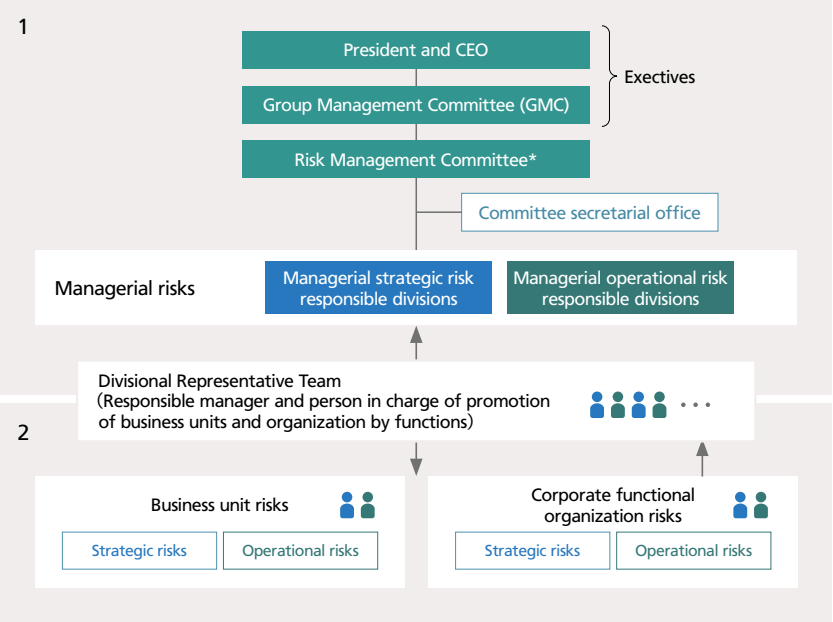
* RBA (Responsible Business Alliance): An alliance of more than 150 leading companies that have agreed to a uniform code of conduct and audit process for their suppliers.

Risk management

As the business environment becomes increasingly complex and diverse, the Ricoh Group positions "risk management" as an indispensable tool for appropriately managing various internal and external uncertainties related to our business and executing our management strategies and business objectives, and all executives and employees of the Group are committed to its improvement. The Board of Directors assumes the role and responsibility of overseeing and monitoring whether the execution of risk management by executives is effective and efficient.

The Ricoh Group's risk management systems can be divided into two main levels. (1)Managerial risks, which are selected and managed autonomously by the GMC for management items of particular importance, within the management of the Ricoh Group. (2) Corporate functional organization risks and business unit risks that each business organization is responsible for managing its own business. These two levels exist for the purpose of clarifying bodies responsible for risk management so as to facilitate agile decision-making and swift action in response to each level of risk, and together form an integrated risk management system. The reevaluation and replacement of risks addressed at each level, based on changes in the level of impact due to environmental changes, are carried out at a frequency of at least twice a year.

The Ricoh Group's risk management structure



*Chaired by Executive Officer, Fellow, or a person in a similar role.

Overview of roles

Exectives

- Determine the risk management activity policy for the entire Ricoh Group.
- Regularly assess and modify the development and operation of the Group-wide risk management activities.

Risk Management Committee*

- Systematically and comprehensively extract and evaluate new risks and make recommendations to the GMC
- Create a highly effective system by reviewing the risk management system
- Enhance risk management activities of the entire Group through cooperation with corporate functional organizations and business units. (ie; Hold the "Group Risk Management Collaboration Reinforcement Conference")

Decision-Making process for managerial risks

Managerial risks are classified and managed as "strategic risks" and "operational risks" based on their characteristics. The following items are managed at the management level as risks related to realizing Circular Economy.

Class	Item	Description		Urgency	Impact	Risk management level
Managerial strategic risks	Responding to ESG and SDGs	Loss of business opportunities and loss of social credibility due to delayed response to issues related to ESG and SDGs such as human rights, climate change, and the circular economy	Response to human rights	5	1	C
			Decarbonization efforts	4	1	B
			Resource recycling	4	3	C
Managerial operational risks	Long-term delay and suspension in supply of products	Risk of losing business opportunities due to unpredictable circumstances such as major earthquakes, tsunamis, floods, pandemics, suspension of supply, and geopolitical risk resulting in: • Delay or suspension in the supply of parts • Delay or suspension of manufacturing by factories • Delay or suspension of operations by distributing agents • Delay or suspension of supply to sales companies	Infectious diseases	2	2	C
			Earthquakes, volcanic eruptions, typhoons	3	2	B
	Large-scale disasters / incidents or accidents	Risks of significant impact on business due to large-scale natural disasters, incidents, or accidents, such as human or property damage	Japan: wind, flood or snow damage	5	1	C
			Outside Japan: major natural disasters, accidents or incidents	3	1	C

Risk level and risk management level

Risk levels

Degree of impact*1	
1	Impact on profit: ¥1.0 billion or less
2	Impact on profit: Up to ¥20.0 billion
3	Impact on profit: Up to ¥50.0 billion
4	Impact on profit: Up to ¥100 billion
5	Impact on profit: Over ¥100 billion

×

Level of urgency Degree of severity, greater than 50% probability of occurrence	
1	Within 30 years
2	Within 10 years
3	Within 5 years
4	Within 3 years
5	Within 1 year

— Risk response

Risk response

	Strategic risks	Operational risks
A	Risks are quantified and controlled to the satisfaction of the decision maker.	Response measures have reduced the risk and the residual risk*2 is within an acceptable range.
B	The overall risk picture is identified, tied to countermeasures, and risk can be controlled/risk response measures are taken.	
C	Key elements to control/mitigate risk are identified and addressed.	
D	The potential events have been identified and at least one countermeasure has been taken for each measure element.	
E	Possible events are not understood, and responses are ad hoc. Response processes and regulations are not in place.	

*1 Consideration of reputational damage and impact on business transactions

*2 Residual risks: Risk remaining after risk management (residual risk can contain unidentified risk. Source: ISO31000

3. Initiatives of the Ricoh Group to realize a circular economy

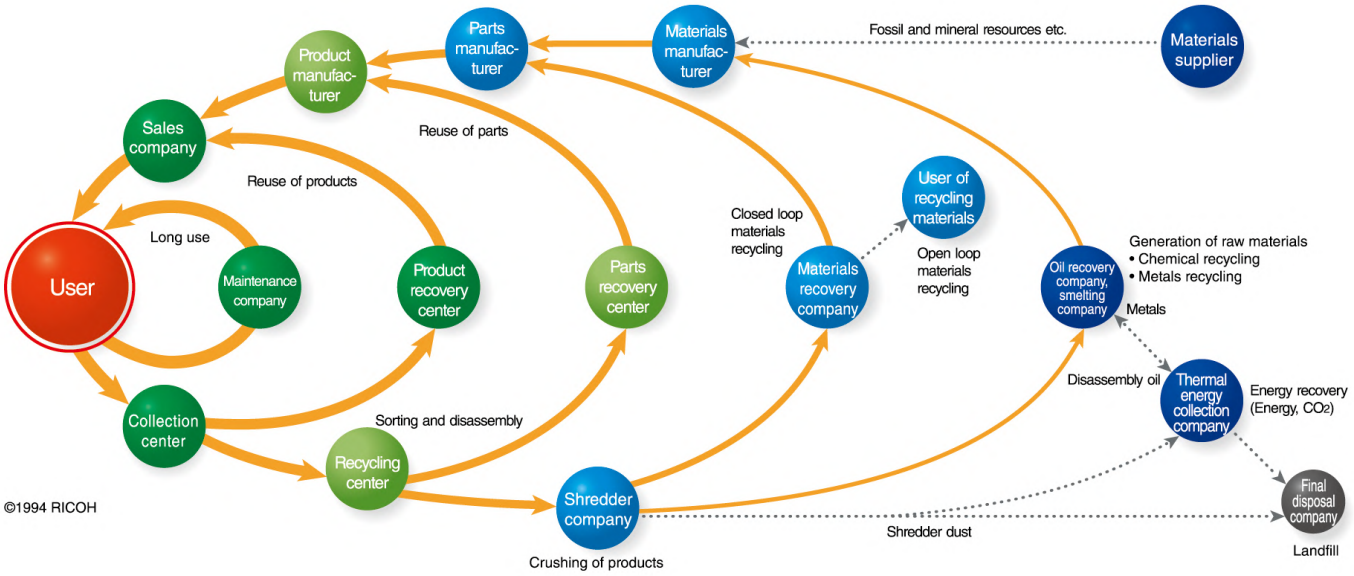
3-1 circular economy concept

Ricoh Group Environmental Declaration

We proactively reduce environmental impact and strive to improve the Earth's self-recovery capabilities to achieve a zero-carbon society and a circular economy through business.

For the Ricoh Group to become the organization we envision, not only does the Group need to realize change towards the creation of a circular economy but society as a whole also needs to realize such change. In 1994, we established the Comet Circle as the basis to encourage such change. The Comet Circle expresses the greater picture of our environmental impact reduction scheme, which includes the scope of the Ricoh Group as a manufacturer and sales company, as well as the entire life cycle of our products, such as upstream and downstream of our business activities. Being well aware that product manufacturers like Ricoh, because of our involvement in the early phases of a product's life cycle, can make the greatest contribution to reducing environmental impact, we engage in all business taking into account the Comet Circle.

The Comet Circle™ concept for realizing a circular economy



Understanding the comet circle chart

Each sphere in the figure shows a partner to realize a sound circular economy. New resources that materials suppliers in the upper right of the chart harvest from nature traverse the right through left of the upper route to become products that reach customer users. In a linear economy with mass production and mass consumption,used products flow from left to right across the bottom route, reaching landfill after energy recovery. Under our circular economy approach, collection and recycling centers process used products and return them to the upper route. Products not sorted as products and parts return to the upper route as materials. The orange arrows in the chart are product reuse, materials recycling, and other loops.

Four action guidelines based on comet circle concept

1. Identify and reduce environmental impact from life cycle perspectives

Efforts across the entire product life cycles are pivotal to reducing environmental impacts. It is therefore necessary to understand not only our environmental impact, but also that of all business process participants. They include suppliers, customers, carriers, and recycling companies.

Therefore, we strive to reduce the total amount of environmental load by grasping the environmental impact of the entire life cycle, and promoting the development of environmental technology, 3Rs (Reduce, Reuse and Recycle) design of products, reduction of emissions in factories and offices, and procurement of PP&E* in consideration of resource recycling.

* PP&E: Plant, Property and Equipment

2. Deploy reuse and recycle practices with lower environmental impacts

The greatest economic value of a resource is "The state in which the product is used by the customer." Within the innermost Comet Circle loops, maintenance and other efforts at customer sites can preserve high value with minimal environmental impacts and costs. When a product is no longer usable, it is important to restore high economic value with minimal environmental impact. We prioritize product and parts reuse loops to engineer as much reusage as we can. When usage becomes impossible, we recycle materials and then chemicals.

The Comet Circle™ loops

Long use	• Long-term use through maintenance and parts replacement
Reuse of products	• Marketing as remanufactured products
Reuse of parts	• Removing and reusing parts from equipment that cannot be remanufactured
Materials recycling	• Plastics, metals, and other materials recovery • Closed: Materials from Ricoh products used in other Ricoh products • Open: Materials from Ricoh products used in products of other brands
Chemical recycling	• Using waste plastics as raw materials for chemicals, including blast furnace reductants, for chemicals decomposition, or creating gas, petrochemicals, or monomers
Energy recovery	• Using materials that cannot be recycled as thermal energy

3. Establish a circular business model

Resource recycling must be economically viable to progress. Instead of treating used products as waste, it is important to make them valuable again through innovation. Manufacturers must endeavor to provide recycled products and materials at minimal costs. Purchasers need to pay fair prices.

In keeping with Comet Circle loops, the Ricoh Group pursues and enhances 3Rs design from manufacturing stages to develop reusable products and parts, enabling long-term use. We have partnered with recycling companies to establish a financially sound business model with a low environmental impact across life cycles, improving recycled resources and minimizing energy and costs associated with reuse and recycling.

4. Partner with stakeholders

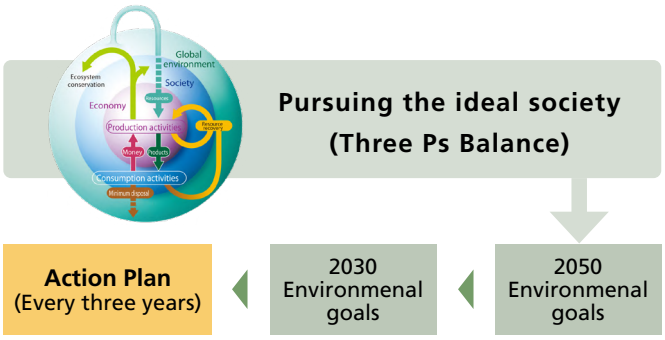
Exchanging information and working closely with partners are vital to lowering environmental impact effectively. For example, by collaborating with material and parts manufacturers Ricoh can procure materials and parts whose CO_2 emissions and new resources consumption are low, with minimal environmental hazards from the chemicals in them. It is important for shippers and carriers to jointly create eco-friendly and cost-efficient transportation modes.

Customers are our chief partners for product and services usage. Low environmental impact is a top priority for them. We therefore need to convey product information in an easy-to-understand manner and work with customers to assess and lower the environmental impact of our operations. We also need to collaborate with trade associations and other entities to formulate standards and create social frameworks with a view to reducing environmental impacts. Such stakeholder partnerships can shrink the eco footprints of offices, workplaces, and the economy.

3-2 Pursuing resource conservation targets and goals

Targeting

The Ricoh Group adopted backcasting method to set environmental targets. This entails setting goals and working backward to determine milestones toward them. We set environmental targets for 2030 and 2050 in decarbonization and resource conservation as milestones to materialize our Three Ps Balance goal.



Environmental targets (resource conservation)

In the resource-conservation area, as in the zero-carbon area, we have set medium- to long-term goals and aim to achieve the goals by "Thorough efficient use and circulation of natural resources," and " Promote further use of conversion to sustainable resources with low environmental impact."

Resource conservation policy

1. Contribute to realizing a circular economy by promoting the efficient use of natural resources.
2. Offer recycled products and promote further use of and conversion to sustainable resources with low environmental impact

The Ricoh Group plastic policy for products

The Ricoh Group has set targets and goals for plastic usage of our products and packaging under consideration of social issues such as "Shifting to a circular economy," and "Tackling ocean micro-plastic pollution"

1. Breakaway from dependence on virgin plastic derived from fossil resources
2. Material recyclable design

The medium to long-term environmental targets are set from the following three perspectives.

1. Reduction of virgin material used in product development

Reducing the use of virgin material used in our products is crucial, and we prioritize the principles of reduce, reuse, and material recycling to the fullest extent possible. To achieve this, we engage in activities such as downsizing and lightweighting, extending product lifespans, promoting product and component reuse, incorporating recycled and renewable materials. By integrating these efforts, we are working towards reducing the usage of virgin materials.

The Ricoh Group environmental goals (resource conservation)

Goals for 2030

- Virgin material usage ratio for products[*1] : 60% or less

Goals for 2050

- Virgin material usage ratio for products[*1]: 12% or less[*2]

*Scope : MFPs, Printers and Digital Duplicators

*1 Virgin material usage rate is the usage rate of new resource inputs to total resource inputs of products.

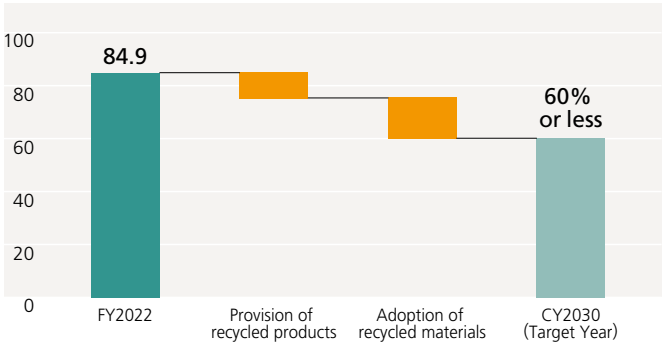
*2 Quoted from the National Institute for Materials Science (NIMS) publication
The resource conservation target is set based on the idea that "In order to use sustainable resources, it is necessary to reduce the total amount of resources used to 1/8 compared to 2000 level".

Specific targets and goals for plastic

- Use of post-consumer recycled plastics for imaging products Goals for 2030: Post-consumer recycled plastic content rate of 50% or more
- Reduction in packaging materials for virgin plastic derived from fossil resources Goals for 2030: 50% or more reduction compared to 2020 level.
- Display resin identification code and single material use Goals for 2025: Clearly indicated on all parts and all packaging materials

Measures and plans towards achieving a new resource usage rate of less than 60% by 2030

Virgin material usage ratio (%)



Downsizing, Lightweighting and Extended Usage:
As a prerequisite to minimize the extraction of new resources from the Earth, we are committed to the ongoing efforts of downsizing, lightweighting, and promoting extended usage of MFPs and Printers.

Offering Products and Parts recycling business:
Expanding the lineup of reusable machines and increasing the variety of reusable supplies and parts.

Adoption of Recycled Materials:

- Expanding the use of recycled plastic materials, initially developed for A3 Color Multifunction Printers, to other models.
- Continual development of recycled plastic materials.
- Exploration and adoption of recycled metal materials, including iron.

2. Resource circulation of end-of-life products

We have set target values for our efforts in 2023 to maximize material recycling of products that cannot be reused from the collected used products, thereby reducing incineration and landfill disposal.

Resource circulation targets for the End-of-Life Products

Reuse and Recycling Rate by 2030: 87.5% or more
Simple Incineration and Landfill Rate by 2030: Less than 0.5%

Reuse and Recycling Rate by 2050: 93.5% or more
Simple Incineration and Landfill Rate by 2050: 0%

3. Waste reduction and efficient resource utilization in business activities

In our business operations, we are committed to activities aimed at minimizing resource waste in every process from development to production and sales, through initiatives such as reevaluating production methods, formulations, and optimizing workflow efficiency. We prioritize internal reuse of generated waste materials, and even when outsourcing disposal, we carefully select partners who can effectively utilize these resources as valuable assets, all with the goal of reducing the use of new resources in our products.

Waste generation reduction targets:

Objective: To reduce the volume of waste generation below the previous year's performance.

Scope: Ricoh (production and non-production sites), Japanese and international production-related subsidiaries.

Water usage targets in business activities:

Objective: To reduce water usage below the previous year's performance.

Scope: Ricoh (production and non-production sites), Japanese and international affiliated companies.

4. Risks and opportunities in the Ricoh Group

The Ricoh Group makes management decisions based on an awareness of the impact that global environmental issues and accompanying social changes will have on management. The transition to a circular economy is accelerating in the global community, and if efforts for resource recycling are not sufficient, there is a risk of damaging our company's corporate value. On the other hand, we will enhance the sustainability of our business activities by strengthening our efforts, and this can lead to the acquisition of medium- to long-term opportunities and competitiveness. The Ricoh Group aims to reduce environmental impact, prepare for risks and new opportunities by working together to achieve a zero-carbon society.

Risks in the Ricoh Group

	Impact on the Ricoh Group	Initiatives of the Ricoh Group
Risk 1 Market Risk Soaring resource prices and widening volatility due to factors such as resource depletion and geopolitical risks	• Rise in procurements costs due to soaring market prices of raw materials required for products and services • Suspension of production due to reduced or interrupted supply of water resources at production plants	Effective use of resources 1. Design for Environment, 3Rs and Long-Term Usage 2. Effective use of resources by making products smaller and lighter 3. New Returnable Eco Packaging for MFPs (Japan)
Risk 2 Reputation Risk Occurrence of environmental pollution and information leaks due to inappropriate disposal of used products and office waste	• Loss of trust in the Ricoh Group and Ricoh Group products due to information leaks and environmental pollution caused by improper disposal of used products and business waste, including illegal dumping • Administrative penalties, surcharge payment, criminal penalties, and loss of social credibility due to violations of environment-related laws	Global collection, reuse, and recycling of used products 1. Reuse and Recycling Program 2. Reuse and Recycling Network 3. Audit system for appropriate disposal of waste from business sites
Risk 3 Policy and Legal Risks Delay in responding to regulations and customer requests to promote a circular economy	• Decrease in opportunities for business negotiations and loss of business negotiations due to the inability to timely market reused products and products using recycled materials that customers want • Costs incurred due to product design changes, etc.	Formulation and promotion of product resource conservation targets 1. Provision of reused products and products using recycled materials 2. Reducing single-use plastic usage

Opportunities in the Ricoh Group

	Expectations and Effects of the Ricoh Group	Initiatives of the Ricoh Group
Opportunity 1 Deepening existing business models Providing value in the MFP/ printer business through implementation of the Comet Circle™	• Profit generation through the Reuse and Recycling businesses • Improve corporate brand value through effective use of resources • Contribute to customers reducing their environmental impact	Reuse and Recycling businesses 1. Manufacturing based on environmentally friendly design policy 2. Optimized Takeback, Remanufacturing and Recycling Sites 3. Reuse/recycle technology to ensure QCD*1 4. Collection machine management system that enables reliable production and sales planning (Japan) 5. Ensuring quality and data security 6. Building a global system 7. Selling remanufactured machine A3 Color Multifunction Printer that reduces customers' environmental impact 1. Significant reduction of CO_2 emissions in the product life cycle 2. The industry's highest post-consumer recycled plastic material usage rate*2 3. Improved repairability and upgradeability
Opportunity 2 New businesses creation Providing value to customer circular economy business	• Profit generation through provision of products and services that contribute to customers' circular economy • Reduce disposal and management costs by reducing the amount of waste generated	Development of substitute materials for plastics derived from fossil resources 1. "PLAiR" born from plants and air Development of new technologies that lead to resource reduction 1. Silicone-top Linerless Label (SSL) Technology(SSL) 2. Labelless thermal technology that enables direct printing on substrates 3. Laser marking technology for transparent resin Technologies for promoting recycling 1. Resin identification handy sensor
Opportunity 3 Streamlining business activities Reducing costs by thoroughly recycling resources in business activities	• Reduce disposal and management costs by reducing the amount of waste generated • Reduce the purchase of new items by recycling waste generated from business sites • Control new water intake by recycling water resources	Effective use of water resources 1. Use of gray water in cooperation with local companies 2. Simultaneous reduction of well water and energy by using equipment wastewater Solvent reuse 1. Reuse of resources through closed solvent reusing in the PxP toner (polymerized toner) production process

*1 Quality, Cost, Delivery abbreviation

*2 North America EPEAT (Electronic Product Environmental Assessment Tool) registration June 2023 research

4-1 Risk

Risk 1 Market risk (soaring resource prices and widening volatility due to factors such as resource depletion and geopolitical risks)

Risk awareness

- If natural resources essential for manufacturing and services are depleted, resource price hikes are expected to increase procurement costs and impact finances. In addition, in production processes that use a lot of water resources, such as the toner production process, there is a risk that supply cutoff in a specific area will have a large impact, such as a production stoppage.

The Ricoh Group's response: effective use of resources

- In order to deal with these risks, we are promoting the effective use of resources and finding alternatives to those resources. In order to reduce the amount of input of new resources in product development, we are focusing on making products smaller and lighter, increasing the use of recycled materials, and designing products that are easy to reuse and recycle after use. In addition, we are promoting the effective use of resources, such as the use of solvents and water in the production process.

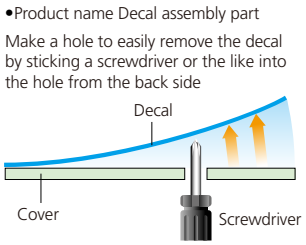
Initiative: Effective use of resources

1. Design for environment, 3Rs and long-term usage

Based on the Comet Circle™ concept, we have formulated and promoted the "Recycling Design Policy" (current Design Policy for End of Life) for product design that considers reduce, reuse, recycle, and long-term use. For example, we have established various kinds of technological developments and know-how, such as strength design that assumes reuse, the improvement of dismantling and sortability, strength design to reduce packaging materials, and the extension of service life of replacement parts and key parts.

We review our Environmentally Friendly Design Policy from time to time, and make repeated revisions in line with social trends, markets, and internal activities. Designers conduct a self-assessment of environmentally friendly design at each design stage, and consideration of reduce, reuse, and recycle is established as one of the design procedures. Examples of environmentally friendly design include "material indication on plastic molded parts", "use of compatible labels", "indication of hidden screw/hidden claw positions", and "improvement in dismantling and sortability."

Design Policy for End of Life



Examples of recyclable design

2. Effective use of resources by making products smaller and lighter

To achieve our company's resource-saving targets, we have been able to realize smaller and lighter imaging business products by setting individual weight targets not only for newly developed products, but also for successors to existing products. For the "RICOH MP C6003/C5503/C4503/C3503/C3003" A3 Color Multifunction Printers released in June 2013, we conducted thorough strength and impact simulations. A new lightweight frame that suppresses deformation by reinforcing the faces and corners while reducing the thickness of resin and sheet metal has achieved a weight reduction of more than 65% (298kg⇒102kg) compared to the predecessor model. In addition, by reviewing parts such as the paper transport path, the size of the duplex unit has been reduced and the duplex unit is stored inside the main unit. There is space-saving for 37% of the occupied area. These technologies are also used in the latest products*, and we are making effective use of resources and are reducing environmental impact by further reducing the size and weight.

*A3 Color Mutifunction Printers"RICOH IM C6010/C5510/C4510/C3510/C3010/C2510/C2010" (Released in February 2023)

3. New returnable eco packaging for MFPs (Japan)

The Ricoh Group introduced eco-packaging in 1994, which saves cardboard resources, and the Group has been actively working to reduce the amount of packaging materials. In 2001, we launched our first reusable resin packaging material, returnable eco packaging, and in 2018, we launched new returnable eco packaging for copiers with improved durability and recycling efficiency.

By improving stackability when collecting packaging materials, volume is reduced to a minimum, which enables low-cost and highly efficient collection. In addition, by using highly durable cardboard for the packaging material body, it has become possible to ensure both durability and weight reduction during repeated use. Compared to conventional recycling eco packaging, we have reduced weight by about 45% while ensuring strength, reducing the burden on workers and improving work efficiency. As a result, we have reduced material usage by 99.41 tons per year and CO_2 emissions by 132.7 tons per year (projected for FY2022).

New returnable eco packaging for MFPs is used in remanufactured machines shipped in Japan, and RFID* is affixed to each component to digitally manage everything from production site shipment to collection. Therefore, we have realized highly efficient logistics.

*RFID: Radio Frequency Identification

New returnable eco packaging for MFPs

Risk 2 Reputation risk (occurrence of environmental pollution and information leakage due to inappropriate disposal of used products and office waste)

Risk awareness

- In the case of improper disposal, including illegal dumping, etc., of end-of-life products and office waste generated during production, there is a risk of causing environmental pollution, and the outsourced company may be charged with a violation of the Waste Management Law and subject to penalties.
  In addition, if there is data remaining in illegally dumped equipment, there is a risk of the customer information being leaked and brand images being tarnished. We must build a system for appropriate disposal.
  Violation of environment-related laws may result in administrative penalties, which could lead to a loss of trust from customers and society.

The Ricoh Group's response: global collection, reuse, and recycle of end-of-life products

- In order to reduce waste at the production stage, we are implementing initiatives to reduce the amount of waste itself by reusing materials. In addition, we provide a program to actively collect used products and a mechanism to prevent illegal disposal of used products. Collected used products are reborn while being reused and recycled.

Initiative: Global Takeback, reuse, and recycling of used products

1. Reuse and recycling program

The Ricoh Group has established resource conservation and recycling as one of the pillars of its environmental conservation activities since the early 1990s, and has been developing global reuse and recycling initiatives for MFPs, printers, supplies, and consumable parts collected from customers by region and by product.

Regional programs Click here for a link

- Americas
- Europe/Middle East/Africa
- Asia Pacific
- Japan

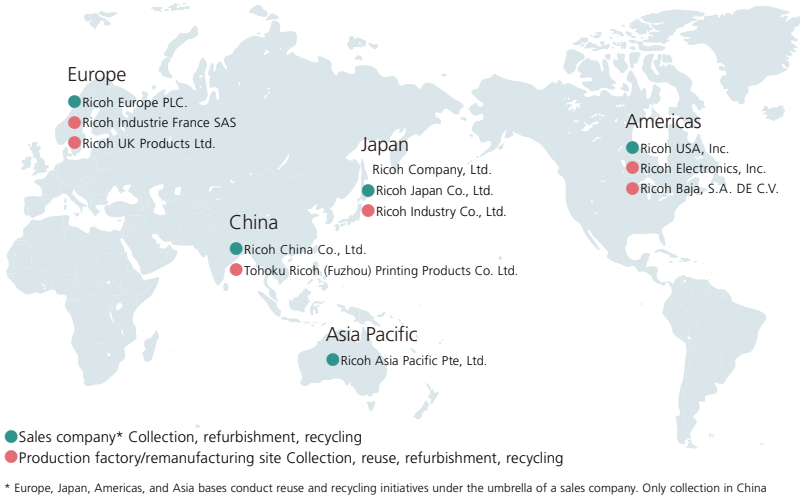
Product programs Click here for a link

- Japan Used product/cartridge collection
- United States Product stewardship and recycling
- United States Takeback program
- Europe Resource smart return program

In Japan, we apply a lease-based business model for MFPs. We maintain a framework to track each unit, with our collection system tapping into it. We leverage the accumulated expertise from this setup in countries with varying business models. The Ricoh Group collects more than 300,000 end-of-life in-house products annually from around the world. Of these, approximately 50,000 are sold annually as reused or recycled products. Products that cannot be recycled are reused or recycled as recycled parts or recycled materials. Since 2010, our product design and technology divisions have helped us reuse functional components in periodically replaced units for imaging products. We will continue progressing with initiatives internally and with suppliers and other business partners to broaden the scope of reuse and recycling.

2. Reuse and recycling network

The Ricoh Group's collection, reuse, and recycle initiatives are being promoted globally through our own bases in Europe, Japan, the Americas, Asia, and China. In addition, in order to ensure that our own waste is properly and reliably disposed of by reliable partners, each Group company selects an industrial waste disposal company based on the conditions of each country (ISO14001, 9001, R2, e-Stewards certification acquisition, etc.)



* Europe, Japan, Americas, and Asia bases conduct reuse and recycling initiatives under the umbrella of a sales company. Only collection in China

Takeback, reuse, recycling (Japan)

The products collected from customers are reused and recycled to the maximum extent possible, centered on our own facilities, based on our Comet Circle™ concept.

Collection centers

The used products, supplies and parts are collected at Collection center and then sent to Remanufacturing center or Recycling center according to the sorting standard.

Remanufacturing centers

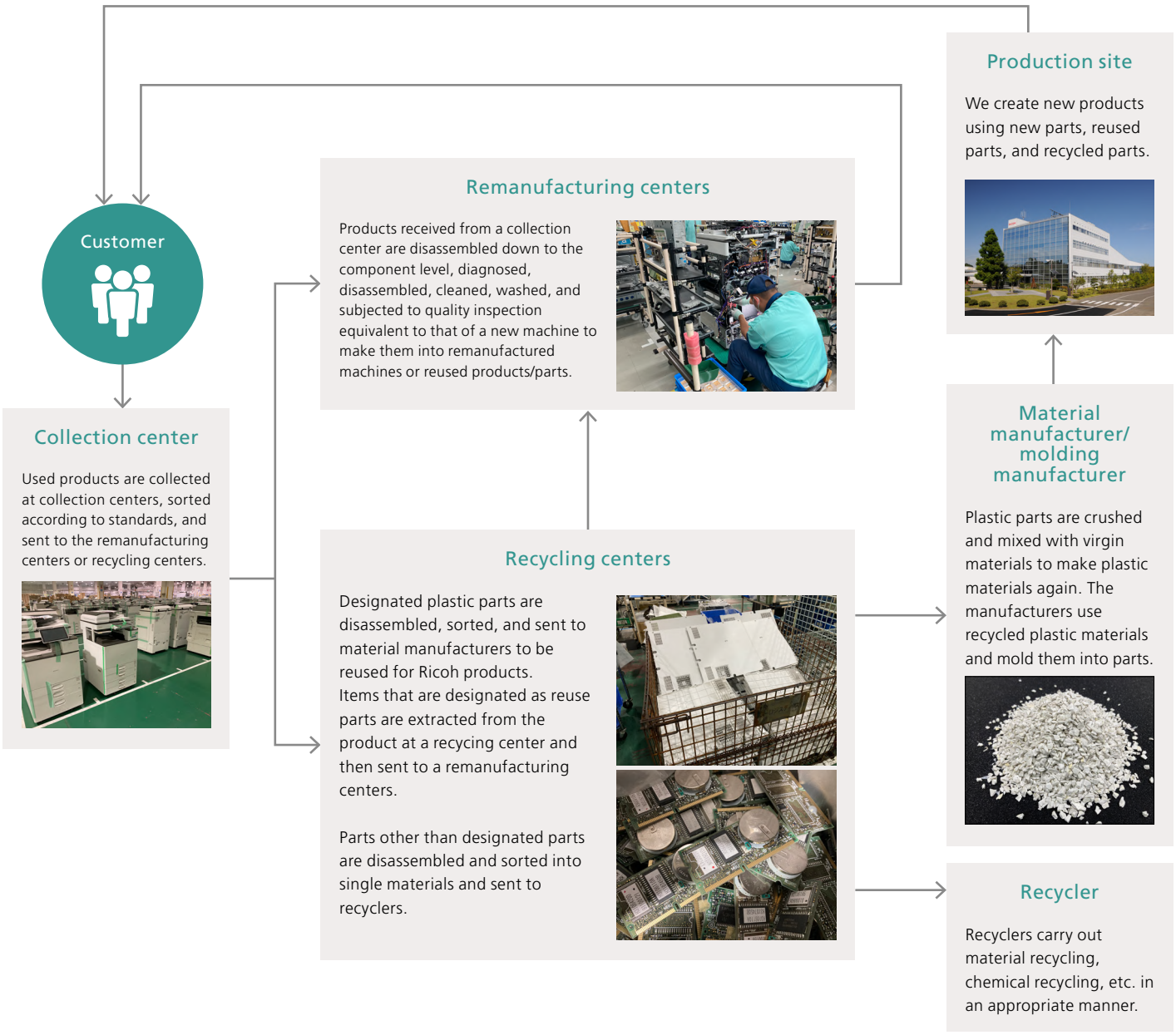
After disassembling and cleaning products, supplies, and parts, and replacing parts, we check according to the same standards as new products, and then reship them as remanufactured products or parts.

Recycling centers

Products, supplies and parts are disassembled or separated into those for reuse and those for recycling, and the parts that are subject to reuse are sent to the remanufacturing center. Items to be recycled are sent to material manufacturers and recyclers for use in recycled materials or energy recovery. In order to prevent the leakage of customer information of the data remaining in the device, the non-reused hard disk is drilled to make it impossible to restore the data.

In addition, the Ricoh Group has obtained certification from the Ministry of the Environment of Japan for the"Wide Area Certification System" (certification number 240). The wide area certification system is a special system in the Waste Management Law for manufacturers to collect our used products over a wide area and recycle and treat them. By acquiring the certification, it is possible for customers to directly collect Ricoh products that are no longer needed and reuse and recycle them responsibly, and we are promoting efforts toward the realization of a more Circular Economy.

Collection, reuse, recycle flow

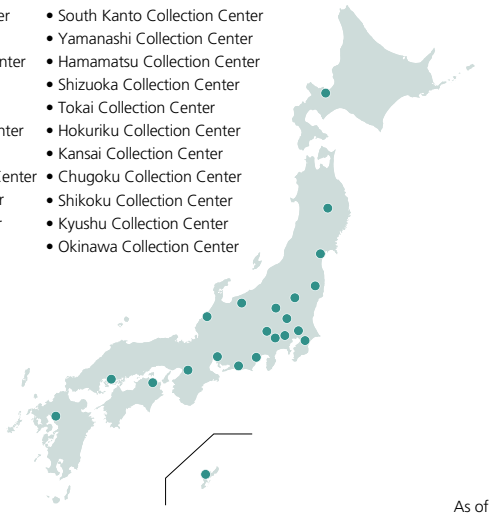


In Japan, we have collection centers, recycling centers, and remanufacturing centers all over the country, and we promote the 3Rs (reduce, reuse, recycle).

Collection center

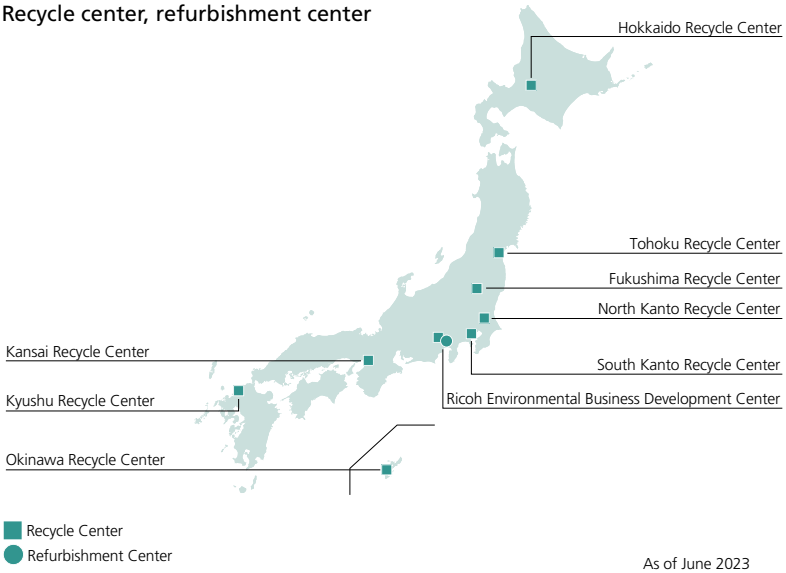
22 bases nationwide

- Sapporo Collection Center
- Miyagi Collection Center
- Fukushima Collection Center
- Iwate Collection Center
- Tokyo Collection Center
- Nishitokyo Collection Center
- Atsugi Collection Center
- North Kanto Collection Center
- Gunma Collection Center
- Tochigi Collection Center
- Chiba Collection Center
- South Kanto Collection Center
- Yamanashi Collection Center
- Hamamatsu Collection Center
- Shizuoka Collection Center
- Tokai Collection Center
- Hokuriku Collection Center
- Kansai Collection Center
- Chugoku Collection Center
- Shikoku Collection Center
- Kyushu Collection Center
- Okinawa Collection Center



As of June 2023

Recycle center, refurbishment center



As of June 2023

3. Audit system for proper disposal of waste from business sites

In 2006, we established a system to check the actual treatment and management status of consignment materials by contractors to which we commission the disposal of waste in order to ensure the proper disposal of discharged waste and to fulfill our responsibilities as a waste generator. Confirmation is carried out once a year, and in addition to the view of waste management, confirmation items are set and evaluated from a wide range of perspectives such as fire prevention and disaster prevention, health and safety, work environment, and recycling status. For confirmation by on-site visits, we will save the results in the cloud in real time by using a mobile PC. In addition, we have built a web questionnaire system that obtains information without visiting a site, and we are promoting DX and operating it effectively and efficiently.

The confirmed results are centrally managed by the system together with the contractor's basic information, and we have established an environment in which necessary information can be viewed and the results of such an inspection can be recorded at the waste discharge site.

In addition, the same system also manages the expiration date of the contractor waste disposal permits, sending an alert email to a person in charge before the expiration date to make sure that the latest version is available.

With the DX conversion above, the man-hours for confirming waste contractors have been reduced by about 30%.

Waste disposal contractor confirmation

Risk 3 Policy and legal regulatory risks (delay in responding to regulations and customer requests to promote a circular economy)

Risk awareness

- In recent years, there has been an increasing demand from customers for efforts towards a circular economy. In Europe and the United States in particular, reused products and products using recycled materials are becoming a requirement at the time of procurement, along with energy-saving products. Also, a regulation requiring procurement of such products is being formulated. Furthermore, the reduction and substitution of single-use plastics found in packaging materials, etc. has been rapidly materialized in the wake of the problem of marine plastic waste. Consumer behavior is also changing, with consideration given to the problem of plastic waste. If we are unable to provide products that meet these regulations and customer requirements, there is a risk that our market value will decline and opportunities for business negotiations will decrease. Also, if there is a delay in responding, in order to recover from this, significant additional costs such as design changes will be required, and the impact on finances is also a concern.

The Ricoh Group's response: Formulation and promotion of resource conservation targets for products

- Since 2007, the Ricoh Group has formulated medium- to long-term environmental goals to reduce the use of new resources, and has focused on the 3Rs (reduce, reuse, recycle) and long-term use of products. In addition, in light of the social trends of the circular economy, we formulated a plastic policy and goals in 2020, expanding the use of recycled plastics and accelerating the reduction of virgin plastics derived from fossil resources. In order to achieve our medium- to long-term environmental goals, we have created a roadmap for reducing the weight of products to be developed and for incorporating recycled plastics, as well as a plan to introduce reused products, and we will continue to provide products that meet the needs of the market.

Initiative: Formulation and promotion of product resource conservation targets

1. Provision of reused products and products using recycled materials

Provision of reused products

The Ricoh Group provides various types of remanufactured machines globally, and is also actively involved in remanufactured toner cartridges, toner containers, and other supply products.

Collecting used products is essential for reused product supply. Demand for reused products is increasing in areas such as European public procurement, and since 2012, Ricoh Europe has added a new collection scheme to increase the collection of used supply products. Ricoh Europe will purchase Ricoh supply products collected by a third-party collection company. Currently (as of June 2023), we have partnered with 15 collection companies in nine countries throughout Europe, and we plan to expand this network further. In France, 17 office equipment manufacturers, including Ricoh France S.A.S, jointly established CONIBI S.A.S to outsource collection operations. CONIBI S.A.S has formed its own free collection system to promote the reuse and recycling of toner cartridges and consumables.

Ricoh US also offers a program to encourage the return of used supplies. In order to facilitate customer returns of toner cartridges and consumables, by including a prepaid delivery label and reusing the box of a purchased product, not only does this save time and money, but it also eliminates the need to procure return boxes, contributing to resource conservation. Through these efforts, we are expanding the collection volume of supply products and promoting the provision of reused supply products.

For the toner containers of the A3 Color Multifunction Printers "RICOH IM C6010/C5510/C4510/C3510/C3010/C2510/C2010" released in February 2023,

we are remanufacturing them in Europe and Japan, including toner containers of predecessor models (three generations ago.) In most cases, toner containers that did not have expensive functional parts could not be refurbished due to economic reasons and have been subjected to energy recovery processing. In this series, we have succeeded in reducing costs by optimizing the collection method and remanufacturing technology, reducing waste by approximately 80t/year by 2023, by approximately 290t/year after 2024, and reducing CO_2 emissions by approximately 260t of CO_2/year by 2023, and 1800t of CO_2/year from 2024 onwards (estimates of both categories for Japan.)

Toner containers for RICOH IM C8000/C6500 and RICOH Pro C5310S/C5300S are remanufactured without disassembly. We have launched a global initiative to remanufacture color toner containers, in which we collect some of the used toner containers returned by customers, clean them, fill them with new toner, and deliver them to customers again. In order to realize toner container remanufacturing, we have developed a technology for diagnosing the life of specific parts and a technology for cleaning the inside of the toner container without disassembling it. The annual reduction of new resources by remanufacturing toner containers is about 36t/year, and CO_2 reduction is about 210t of CO_2/year.

Remanufactured toner cartridge

Usage of recycled plastic

The Ricoh Group has traditionally labeled the material and grade of each part during manufacturing, and it has maintained the quality of recycled plastic by recycling each grade after collecting the product. Through this, we have realized horizontal recycling that recycles collected exterior and inner parts into those that require the same high quality characteristics (flame resistance, durability, strength, etc.) In addition, from 2016, using commercially available recycled plastic materials*1, we have developed a recycled plastic that can be used repeatedly for inner parts, and we have begun using it in combination with a similarly developed recycled exterior plastic for MFPs. We also use recycled plastic made from 100% commercially available recycled plastic materials for our toner containers. This recycled plastic toner container is used in more than 95% of the office toner containers*2 manufactured by the Ricoh Group.

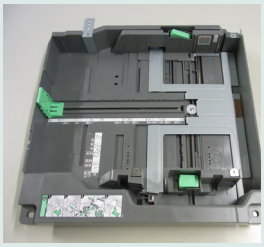
*1 Wasted plastic material collected from the market
*2 Toner containers made of PET material

Exterior cover with recycled plastic from horizontal recycling

Toner containers made from commercially available recycled plastic materials (PET materials)

Fish boxes used in the markets and plastic packaging containers

Waste plastic from home appliances



Used for paper feed trays of MFPs, etc.

Use of recycled steel (electric furnace steel plates)

The Ricoh Group has jointly developed electric furnace steel plats with the same quality characteristics as blast furnace steel plates in collaboration with Tokyo Steel Co., Ltd. (Tokyo Steel hereinafter). In 2012, we began incorporating the electric furnace steel plates for the first time in the industry.

Electric furnace steel plates were mostly used for construction until then, where strength characteristics were emphasized. However, through the joint development of Ricoh and Tokyo Steel, we have secured quality performance in terms of properties such as thinness (thickness of 2mm or less), electrical conductivity, and workability required for MFPs, making it possible to adapt these plates for MFPs. Specifically, the Ricoh Group mainly identified the material properties required for MFPs, and Tokyo Steel developed materials, specializing in thinning plates, thinning plating, improving electrical conductivity, and improving press workability. In addition, Tokyo Steel's advanced impurity removal technology and rolling technology have enabled the development and production of high-performance steel plates for MFPs.

The developed electric furnace steel plates are currently installed in high-speed MFPs and production printers. We are also expanding the number of parts that use electric furnace steel plates, and we will work to further reduce the amount of newly input resources as we expand the number of products that use them.

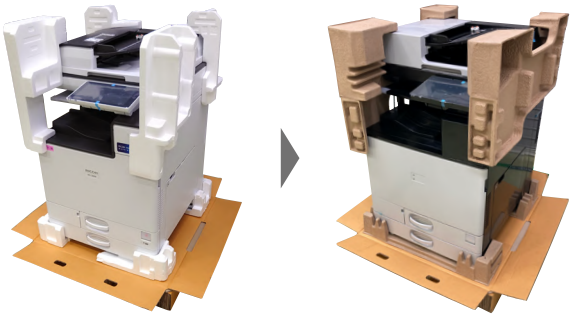
Electric furnace steel plates used for high-speed MFP parts

2. Reduce single-use plastic usage

Packaging material for product transportation has generally used polystyrene foam (EPS) until now, which is derived from fossil resources, but the Ricoh Group is working to switch this to recyclable paper packaging. In order to overcome the problem of shock absorption, we use shock simulation technology to achieve the same high shock absorption performance as EPS, even with paper packaging materials that are harder than EPS.

The A3 Color Multifunction Printers "RICOH IM C6010/C5510/C4510/C3510/C3010/C2510/C2010" released in February 2023 switched to a pulp mold that uses waste paper as raw materials and uses approximately 54% less plastic packaging material than its predecessor. As a result, it has become possible to reduce the amount of plastic waste by approximately 260t/year. This is an industry-first adoption of pulp mold-based packaging materials for medium and high-speed* A3 Color Multifunction Printers, and this won the Japan Packaging Contest 2022 "Large and Heavy Package Category Award."

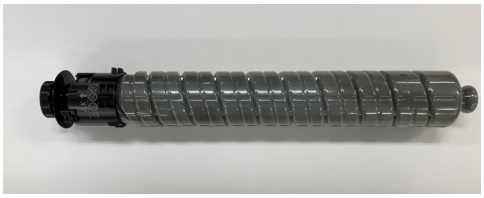
*35ppm or higher (at the time of launch, Ricoh research)



Paper packaging material image

In addition, we have eliminated the use of fossil-based plastic packaging bags for toner containers in this product group. Conventionally, to prevent toner from deteriorating during storage, sealing with a packaging bag was essential. This product eliminates the need for a sealed packaging bag by improving the moisture resistance of the toner. As a result, it is possible to reduce the amount of plastic waste by about 76t/year, and the CO_2 reduction effect is about 3t of CO_2/year. We are aiming to reduce the amount of plastic packaging materials in various ways for the models we develop in the future.

With toner container packaging bag



Without toner container packaging bag

4-2 Opportunity

The transition to a circular economy has become commonly recognized as a global issue next to climate change countermeasures. While each country is formulating policies to shift to a circular economy, by incorporating these policies and market trends into products and services and expanding them globally, we recognize that we will be able to create opportunities through differentiation from competitors and the creation of new markets.

Opportunity 1 Deepening existing business models (provision of value in the MFP/printer business by implementing the Comet Circle™)

Opportunity recognition

- Since the 1990s, the Ricoh Group has been actively working on the product and parts reuse and recycling business. In order to establish product and parts reuse and recycling as a business, various initiatives are required. Through long-term initiatives, the Ricoh Group has acquired a lot of technologies and know-how to commercialize product and parts reuse and recycling.
  With the technologies and know-how we have cultivated over many years, we are growing into a business that will record sales of approximately 30 billion yen in FY2022.

Initiative: Reuse and recycling businesses

● 1. Manufacturing based on environmentally friendly design policy

The most important thing for product remanufacturing is to incorporate the perspectives of reuse, recycling and long-term use into the product design concept beforehand. The Ricoh Group established what we now call the Design Policy for End of Life in 1993. The Environmentally Friendly Design Policy incorporates the standardization of parts and materials to facilitate the reuse and recycling of collected products and parts, as well as design standards to improve disassembly. By designing based on this policy, extra man-hours and costs are suppressed during reuse and recycling. For more than 20 years, the Ricoh Group has been designing new products on the premise of reuse and recycling.

Comet Circle™ exhibit installed at the Ricoh Environmental Business Development Center

2. Optimized Takeback, Remanufacturing and Recycling Sites

We are promoting the reuse and recycling of used products, supply products, and parts collected from customers at our own bases in Europe, Japan, the Americas, Asia, and China. In order to remanufacture products, first it is necessary to efficiently and reliably collect used products from the market. We have established 22 collection points all over Japan to ensure reliable collection. Refurbishment is concentrated at one location: the Ricoh Environmental Business Development Center in Gotemba City, in an effort to improve efficiency. Over the years, we have worked on the optimal placement of our bases and have built the current system. In addition, one of the Ricoh Group's strength in the reuse and recycling business is that the Ricoh Environmental Business Development Center has both product refurbishment and recycling functions. Among the collected used products, we extract necessary parts from products that cannot be remanufactured. We effectively utilize these parts as service parts, replacement parts for remanufactured machines and parts for new machines. Furthermore, a system is in place to disassemble and separate parts that cannot be remanufactured by partsas much as possible and sell them as as valuable recycling materials,.

3. Reuse/recycle technology to ensure QCD*

In order to optimize QCD* in the reuse and recycling business, the Ricoh Group has established eight types of technologies: "evaluation technology", "diagnosis technology", "disassembly technology", "cleaning technology", "washing technology", "restoration technology", "erasure technology", and "recycling technology." The most important technologies for generating profits are "evaluation technology" and "diagnostic technology." Evaluation technology is a technology that determines whether or not a product can be remanufactured by evaluating the remaining life of used product parts and other factors. Through this, transportation costs are kept down by transporting only reusable products from collection points nationwide to the Ricoh Environmental Business Development Center. Diagnostic technology is a technology that diagnoses the condition of used products subject to recycling. We are working to improve production efficiency by classifying used products in different states into different levels, and inputting them to the remanufacturingline for each level.

*QCD: Quality, Cost, Delivery abbreviation

4. Collection machine management system that enables reliable production and sales planning (Japan)

For commercialization, it is necessary to make a production plan and a sales plan. At first, it was difficult to formulate a production plan in the product reuse and recycling business because we did not know when and how many used products would be collected. To solve this problem, in 2005, the Ricoh Group introduced technology to predict the amount of collected waste, and it built a management system for collected machines. It is now possible to predict when and which models of products will be collected from all over Japan, and how many, making it possible to formulate reliable production and sales plans.

5. Ensuring quality and data security

Remanufactured machines go through exactly the same quality assurance steps as new machines. In addition, quality assurance, such as data security, which is specific to remanufactured machines, is also required. For example, when reusing a hard disk, we thoroughly implement traceability management and completely erase the data. Since 2012, the remanufacturing process of RICOH INDUSTRIE FRANCE SAS and RICOH UK PRODUCT LTD., the remanufacturing sites in Europe, has been certified by the international certification body BSI*, and reliability has also been proven externally.

*British Standards Institution

6. Building a global system

Japan's know-how and technology are deployed horizontally at overseas remanufacturing sites. Recently, reuse and recycling technologies are being shared among reuse and recycling bases, including sales offices. In addition, in order to meet the growing demand for used products, we will supply collected products and remanufactured machines from developed countries with high collection volumes to emerging markets (Asia and China*) in an effort to optimize supply and demand on a global basis.

*In 2015, we became the first Japanese manufacturer to obtain approval from the General Administration of Quality Supervision, Inspection and Quarantine to import used MFPs to China and remanufacture them

7. Selling remanufactured machine

Since 1997, when the Ricoh Group launched its first remanufactured machines, we have been selling remanufactured machines while responding to the needs of markets in each region of the world.

We have multiple types of remanufactured machines to meet the needs of our customers and the market.

- High quality remanufactured machines with a like-new warranty
- Refurbished machines with replaced consumable parts and inspection
- Cleaned and Checked refurbished machines

As high quality remanufactured machines guaranteed to be as good as new, we sell them in Japan as RC machines (reconditioning machines), and in Europe, the Americas, and Asia as the GreenLine series.

In February 2022, the Ricoh Group's GreenLine series 9 models (the Americas) became the first in the world to acquire certification in the "remanufactured imaging equipment" category of the International Energy Star Program Ver. 3.1.

Latest reconditioned machine
RICOH MP C4504RC
(Released in June 2021)

- Reuse rate 81%
- Approximately 19% reduction in CO_2 emissions throughout the life cycle (Comparison with new machines)

Remanufactured product flow from collection through shipment

Collection

Machines are transported in double stacking, and used products are collected at collection centers.

Sorting

Only candidates for remanufacturing go to a remanufacturing center.

Diagnosis

The appearance, images, and functions are checked and diagnosed to see if the machines can be used as a remanufactured machine.

Disassembly

Disassemble the machine, remove items such as the exterior cover, and clean the dirt that adheres to the inside.

Washing

Reused parts with complex shapes and large sizes are washed with water.

Drying

The cleaned parts are dried. This is devised so as not to leave water marks in the drying process.

Assembly

The reused parts after washing and cleaning and new parts are assembled into the frame.

Adjustment

Adjust the position and color of the image.

Inspection

We perform inspections with the same quality standards as for new machines, by carrying out inspections such as image inspections and noise inspections in accordance with standards.

Finishing

Arrange the included items, fix the moving parts with tape, and finish.

Packing

Using eco-friendly, recycling-oriented minimalist packaging to reduce packaging materials.

Shipping

The packaged product is carefully shipped to the customer.

Initiative: A3 Color Multifunction Printers that reduce the customer's environmental impact

The RICOH IMC6010/C5510/C4510/C3510/C3010/C2510/C2010, an A3 Color Multifunction Printer that provides value in terms of both DX and sustainability, was launched in Japan in February 2023 with 7 types and 16 models.

This product is the flagship product of the Ricoh Group, and its predecessor has sold more than 1 million units worldwide, occupying a high market share as an A3 Color Multifunction Printer. In addition to the industry's highest post-consumer recycled plastic material usage rate, newly developed low-melting point toner and energy-saving control microcomputers are installed, and the company's highest level of plastic packaging reduction is achieved. We contribute to reducing the environmental impact of our customers' business activities and contribute to the realization of a Circular Economy and a zero-carbon society through our business.

Ricoh IM C3010 with renewed design

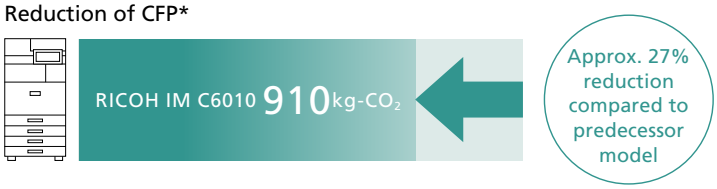
1. Significant reduction of CO_2 emissions in the product life cycle

In the product life cycle, the major CO_2 emissions (carbon footprint: CFP) are raw material acquisition use and maintenance. For this reason, in the acquisition of raw materials, post-consumer recycled plastic materials* are used in at least 50% of the total weight of the main body plastic. In terms of usage and maintenance, the use of low-melting point toner reduces power consumption during use by approximately 10% compared to its predecessor, resulting in a CFP reduction of approximately 27% compared to its predecessor.

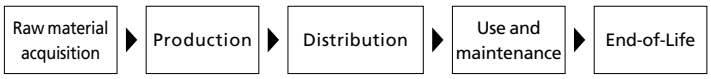
By choosing this product, customers can not only reduce power consumption during use, but they can also procure products with low CFP.

*post-consumer recycled plastic material: Wasted plastic material collected from the market

Reduction of CFP*



Life cycle



CFP comparison of RICOH IM C6010 and predecessor model

*CFP is the amount of greenhouse gases emitted over the entire life cycle described above (from raw material acquisition to End-of-Life) converted to CO_2 amount.

2. The industry's highest post-consumer recycled plastic material usage rate*1

The machine is equipped with more than 50% of the total amount of plastic in the A3 Multifunction Printer's main body, which is the highest standard in post-consumer recycled plastic in the industry. In order to achieve the ambitious target of 50% compared to the 6.3% post-consumer recycled plastic material usage rate*2 in predecessor machines, we worked with material manufacturers to develop new materials.

While working on material development, we also proceeded with product development, set a target value for the percentage of post-consumer recycled plastic materials used for each part, and achieved the target by designing parts that match the new materials. As a result, it is possible to utilize approximately 5,600 tons of collected materials per year with this product alone.

Recycled plastic (right) for the front panel of the product, which uses 80% post-consumer recycled plastic materials (left)

*1 North America EPEAT (Electronic Product Environmental Assessment Tool) registration June 2023 research

*2 Post-consumer recycled plastic material usage rate: Ratio of wasted plastic collected from the market to the total weight of the main body plastic

3. Improved repairability and upgradeability

Ease of repair and upgradeability are also important for the realization of a circular economy. This product is designed based on the Environmentally Friendly Design Policy (refer to page 14, 1. Design for Environment, 3Rs and Long-Term Usage). For example, in the electronic circuit board of the controller, parts with short lifespans are grouped together to make it easier to replace them when they are reused after being collected as used devices. In addition, MFPs that have been sold since early 2019 have been equipped with RICOH AlwaysCurrent Technology, a mechanism that allows the built-in software to be upgraded via the network and new functions to be added to the machine. By using RICOH AlwaysCurrent Technology, the customers can use the latest security and functions that improve the productivity of business.

For more information on RICOH Always Current Technology, please refer to the link below.
www.ricoh.co.jp/products/always-current-technology/

With horizontal application of the materials and technologies developed for this product to future products, we will contribute to reducing the environmental impact of our customers, reduce the usage amount of virgin materials extracted from the earth, and reduce the usage amount of plastic derived from fossil resources. All of these actions will contribute to the realization of acirculer eonomy.

Opportunity 2 New businesses creation (provision of value to customers' circular economy business)

Opportunity recognition

- The Ricoh Group has long been working on optical, imaging, materials, manufacturing, control, and system technologies, and by combining them with unique ideas in addition to advanced digital technology, we believe that we can continue to create new value. We will continue to provide new products and service that contribute to the realization of a circular economy.

Initiative: Development of Substitute Materials for Plastics Derived from Fossil Resources

"PLAiR" made from plants and air

PLAiR is a new material developed by Ricoh. The main raw material is PLA (polyactic acid), which is derived from plants and has a compostable property. Using Ricoh's foaming control technology with supercritical CO_2, we succeeded in the foaming of PLA, a material that is difficult to process. This foaming control technology makes it possible to create sheets with a small amount of raw materials. By using foamed PLA sheets, it is possible to achieve molding into various applications, and we can expect to reduce plastics derived from fossil resources by replacing them.

Furthermore, it is estimated that CO_2 emissions over the product life cycle of PLAiR can be reduced by approximately 32%* per weight compared to conventional polystyrene paper (PSP), contributing to the realization of a zero-carbon society.

*Trial calculation by the Sustainable Management Promotion Organization (SuMPO) (calculation per weight, assuming 100% incineration after use)

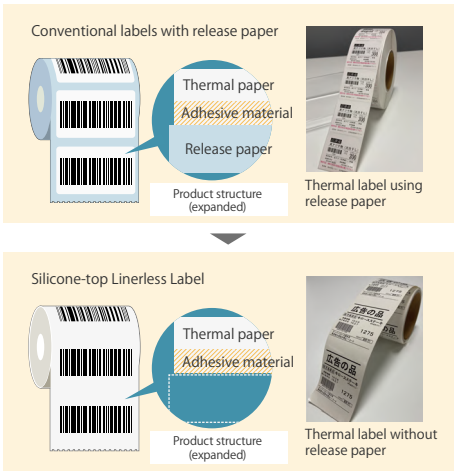
PLAiR sheet

Initiative: Development of New Technologies that lead to Resource Reduction

1. Silicone-top Linerless Label (SSL) Technology

In general, adhesive labels are mainly in the form of products affixed to release paper. Release paper, which requires the same amount of paper resources as thermal paper, is disposed of as waste after the label is attached to the product, so reducing the amount of release paper has been an issue. In 2014, the Ricoh Group launched a Silicone-top Linerless Label (SSL) as a thermal label that does not use release paper, based on thermal paper technology cultivated over many years. SLL has begun to be used not only in food POS labels for retailers, but also in the convenience store industry. While reducing the amount of paper resources used and reducing waste at the same time, GHG emissions per printable area can be reduced by approximately 30% compared to labels with release paper.

*Ricoh research. The National Institute of Advanced Industrial Science and Technology IDEA Ver3.2 is used to calculate GHG emissions



2. Labelless thermal technology that enables direct printing on substrates

Labelless thermal is a method in which a reactive ink developed by Ricoh is partially coated on package films, and printed directly by applying heat to the coated area with thermal head printer or laser marker. Information such as the product name and raw materials can be printed directly on the package, eliminating the need for thermal paper labels that were previously attached. Compared to thermal paper labels, GHG emissions per printable area can be reduced by 80% or more*.

*Ricoh research The National Institute of Advanced Industrial Science and Technology IDEA Ver3.2 is used to calculate GHG emissions

Packaging

*From Lawson, Inc. press release dated November 25, 2022

3. Laser marking technology for transparent resin

We are developing laser marking technology that can directly print items such as characters, logos, and illustrations on plastic containers such as PET bottles without ink. Recycling PET bottles requires time and effort to remove the labels and stickers made of other plastic materials from the bottle body, which is made of a plastic material called polyethylene terephthalate. By using this technology to print product information directly on the PET bottle body, labels and stickers are no longer required, reducing the amount of plastic used and emitted, as well as the GHG emissions in the label procurement/disposal and printing processes. We have the potential to reduce this volume by more than 50%*. Furthermore, there is no need to remove the labels, making recycling easier.

*Ricoh research The National Institute of Advanced Industrial Science and Technology IDEA Ver3.2 is used to calculate GHG emissions

PET bottle printed with laser marking technology

The "Asahi Jurokucha" PET 630ml direct marking bottle, which uses this technology, won the Beverage Packing Category Award at the 2022 Japan Packaging Contest (sponsored by the Japan Packaging Institute), the 2022 Good Design Award (sponsored by the Japan Institute of Design Promotion), the Asia Star Award (ECO PACKAGE) at Asia Star 2022 (sponsored by the Asian Packaging Federation), the World Star Award at World Star 2023 (sponsored by the World Packaging Organisation), and the 47th Kinoshita Award (sponsored by the Japan Packaging Institute) in the new creation category.

Initiative: Technologies for promoting recycling

Portable plastic identification sensor

In March 2023, we launched the RICOH HANDY PLASTIC SENSOR B150, a compact and lightweight portable sensor that can easily identify resin (plastic) materials. The sensor irradiates the resin with near-infrared rays and measures the spectrum of reflected light to identify the resin. It can also work with smartphones to distinguish 13 types of resin*.

Sorting is an indispensable process for recycling and circulating plastics. This sensor makes it easier to identify waste plastics without special knowledge. It contributes to the promotion of efficient recycling of resources such as end materials and waste materials from manufacturing plants that were disposed without knowing the type of resin.

The film manufacturer (Meiwa Pax Co., Ltd. Hyogo Factory) using this sensor is now able to sort waste plastics by type. Of the 7t/month processed, the polypropylene recycling rate has improved by 80%, and GHG emissions have been reduced by approximately 170t of CO_2/year. In addition to the manufacturing industry, which has problems in waste disposal, this sensor is also used by students to experience social issues in educational settings.

*Current as of March 2023

Portable plastic identification sensor
RICOH HANDY PLASTIC SENSOR B150
* Received the 2022 Good Design Award (sponsored by the Japan Institute of Design Promotion) and selected as one of the Good Design Best 100


Scenery at the "Ocean and Japan Project" in Obama City, Fukui Prefecture

Opportunity 3 Streamlining business activities (cost reduction through thorough resource recycling in business activities)

Opportunity recognition

- The Ricoh Group strives to reduce the amount of water used and waste generated in its business activities as much as possible, and to reuse it as a resource. As a result, waste disposal costs and waste management costs can be reduced, and new purchase costs can be curtailed. Resource recycling leads to profit creation.

Initiative: Effective use of water resources

Starting with the toner production process, water resources are particularly important and essential for us. Although the impact varies depending on the business characteristics and the local environment, we recognize that the depletion of water resources will lead to business continuity risks. In addition, reducing the amount of water used by reusing water leads to cost reduction and contributes to the creation of profits. The Ricoh Group has established a policy on water resources and is globally expanding the effective use of water resources in consideration of regional characteristics.

Water policy

1. We recognize that the safe and secure use of water resources is the right of everyone, and we will act accordingly.
2. We will understand the impact of our business activities on water resources, take local characteristics into consideration, and set goals for our activities.
3. In addition to complying with laws and regulations, we will manage water resources in consideration of international standards, initiatives, and public policies.
4. We will contribute to solving water resource issues not only in our company, but also in the world through technological innovation.
5. We will strive to raise the awareness of all employees, and each employee will act as a starting point to communicate with stakeholders and work to solve water resource issues in the local community.
6. When procuring raw materials, products/services, equipment, etc., we will consider not only resource conservation, but also climate change and pollution prevention.

Specifically, we are promoting the following initiatives for the effective use of water resources.

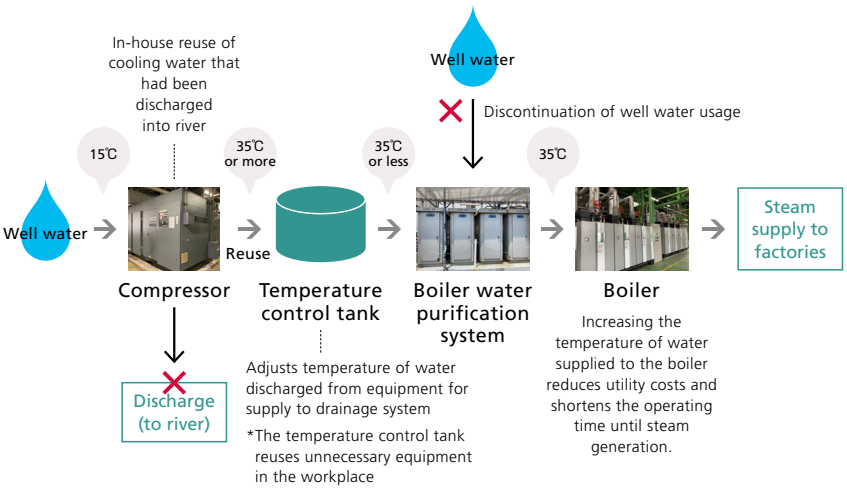
1.Usage of gray water in cooperation with local companies

Shanghai Ricoh Digital Equipment Co., Ltd. (SRD hereinafter), which manufactures imaging products, utilizes the policies of the Shanghai Municipal Government for the purpose of water resource conservation and protection activities, and is using gray water discharged from the adjacent beverage company's factory. By using this gray water for flushing toilets, sprinkling and cleaning water, make-up water for various cooling towers, and water for firefighting, we are able to reduce the amount of tap water used and the cost. We are also now able to comply with the limits set by the city of Shanghai on the amount of tap water used. This was made possible through concerted efforts of the government, local businesses, and SRD.

2. Simultaneous reduction of well water and energy by using equipment wastewater

Ricoh's Numazu Plant uses a large amount of well water to cool equipment such as compressors. Until now, the well water used for cooling was discharged to the river, but by using this waste water as raw water for the boiler pure water equipment, we have reduced the amount of well water used by about 36,000 m^3/year. In addition, since the temperature of the wastewater used as cooling water is higher than that of well water, the recovery of the waste heat from the wastewater contributes to a reduction of 46 tons of CO_2 emissions, and a reduction of approximately 2,400,000 yen/year in utility costs.

Overview of reduced water consumption through reuse of water discharge



Initiative: solvent reuse

Reuse of resources through closed solvent reusing in the PxP toner (polymerized toner) production process

Ricoh's Numazu Plant and the Tohoku Plant of Ricoh industry conduct closed recycling of solvents used in the production of PxP toner. Solvents used in part of the production process have been material-recycled by subcontractors, but with the aim of recycling and reusing this solvent in our own processes, we have been working on improving material design of toner and production technology. It was difficult to reproduce conventional mixed solvents containing multiple chemicals, but as a result of research, we succeeded in developing production technology using a single solvent instead of mixed solvents. Through this, except for the cleaning solvent generated when switching products, it is possible to reuse the solvent used in production. This not only makes it possible to reduce waste solvants, but we were also able to slash new solvent inputs by about 90%, and we were also able to achieve significant costs reductions. Furthermore, by establishing a process for resolvating waste solvents that had been outsourced, we are now able to cover most of the solvents used in normal production with reused solvents.

Facilities that conduct reusing of solvents (distillation facilities)

5. Performance

Virgin material usage ratio of products

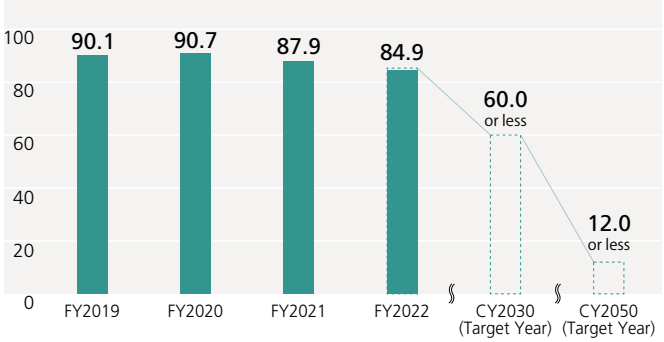
	Target	Unit	FY2019	FY2020	FY2021	FY2022	Supplementary explanation for actual performance in FY2022
Virgin material usage ratio of products	2030: 60% or less 2050: 12% or less	%	90.1	90.7	87.9*	84.9	We have achieved our fiscal year 2022 target (85% or less) due to increased reuse, including the nearly planned sales of recycling machines, and significant integration of recycled plastic into the A3 Color Multifunction Printers released in February 2023.
Amount of virgin materials used in products		1,000t	92.4	77.7	70.9	79.5	

Scope : MFPs, Printers and Digital Duplicators
*Corrected some errors in FY2021 data

	Target	Unit	FY2019	FY2020	FY2021	FY2022	Supplementary explanation for actual performance in FY2022
Use of post-consumer recycled plastics for imaging products	2030: 50% or more	%	–	–	8.6	16.2	We are steadily increasing in accordance with the plan by promoting integration into our flagship multifunction printers and printers, and expanding its use in supply products as well.*
Reduction in packaging materials for virgin plastic derived from fossil resources	2030: 50% or more (vs.FY2020)	%	–	–	+5.3	+5.4	We have been engaged in efforts to reduce plastic packaging materials in our imaging products, but the contribution rate for this fiscal year is relatively low, resulting in an increase compared to the fiscal year 2020 due to increased sales volume. However, with the release of flagship products that significantly reduce plastic packaging materials in February, we anticipate that the reduction rate will improve in the future.
Display resin identification code and single material use	2025: Clearly indicated on all parts and all packaging materials		–	–	–	–	In 2021, we successfully incorporated Design Policy for End of Life into practice and completed its formalization into a set of rules. As planned, we anticipate achieving material indication and single materials by 2025.

*Including recycled plastic components

〈Reference〉Virgin material usage ratio* Progress toward our target value(%)

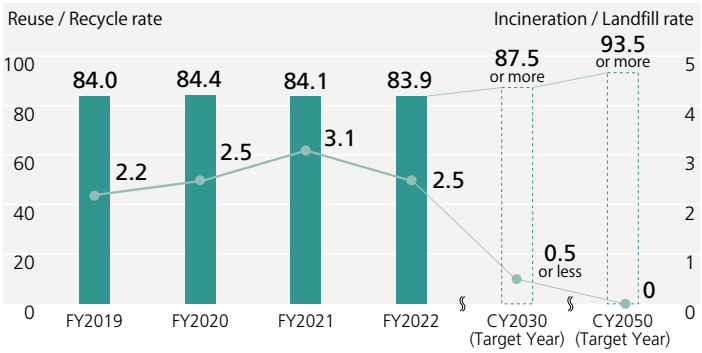


*The usage rate of new resource inputs to total resource inputs of products)

Resource circulation of end-of-life products

	Target	Unit	FY2019	FY2020	FY2021	FY2022			
						Total	Breakdown		
							Main unit/ accessories	Supplies	Parts
Collection amount of end-of-life products	–	t	51,948	47,843	47,705	51,158	38,439	11,109	1,609
Reuse / Recycle / Energy Recovery Volume	–	t	50,806	46,627	46,221	49,888	37,517	10,784	1,587
Reuse/ Recyclerate	2030: 87.5% or more 2050: 93.5% or more	%	84.0	84.4	84.1	83.9	95.1	43.6	93.3
Energy Recovery rate	–	%	13.8	13.1	12.8	13.6	2.5	53.5	5.4
Incineration / Landfill rate	2030: 0.5% or less 2050: 0%	%	2.2	2.5	3.1	2.5	2.4	2.9	1.4

〈Reference〉 Trend of Reuse/Recycle rate and Incineration / Landfill rate



Waste reduction and efficient resource utilization in business activities

	Target	Unit	FY2019	FY2020	FY2021	FY2022	Supplementary explanation for actual performance in FY2022
Total amount of waste	Less than the previous year	t	66,719	58,813	61,752	65,785	Due to the increase in production volume driven by the recovery from the COVID-19 pandemic and the impact of equipment issues, there has been an increase in waste.

Scope of data collection: Ricoh Company Ltd. (production/non-production sites), production subsidiaries inside and outside Japan, non-production subsidiaries in Japan

	Target	Unit	FY2019	FY2020	FY2021	FY2022	Supplementary explanation for actual performance in FY2022
Water withdrawal*	Less than the previous year	1,000m^3	4,058	3,237	3,158	3,146	While production volume has increased due to the recovery from the COVID-19 pandemic, we have successfully reduced water usage through the thorough internal circulation of water resources, including the reuse of facility wastewater.
Reused / recycled volume	–	1,000m^3	635	412	439	517	

Scope of data collection: Ricoh Company Ltd. (production/non-production sites), production subsidiaries inside and outside Japan, non-production subsidiaries in Japan, non-production subsidiaries outside Japan.
*Amount of water withdrawal represents the aggregate amount for municipal water, industrial water, groundwater, river and pond water.

Appendix：The Ricoh Group's progress in resource conservation

The Ricoh Group has been promoting achievement of a zero-carbon society and a circular economy through years of environmental management.

1976	• Establishes the Environmental Promotion Section
1992	• Establishes "Ricoh Group Environmental Principles"
1993	• Formulates "Recycling Design Policy"
1994	• Establishes "Comet Circle", the concept of a circular economy
1997	• Launches remanufactured products for the first time
1998	• Advocates a concept of "Environmental Sustainability Management" • Establishes the Environmental Action Plan • Development of returnable eco-packaging
2001	• Achieves zero waste factory at the Ricoh Group global main production sites
2002	• Establishes "Three Ps Balance" as a concept of a sustainable society • Signs the United Nations Global Compact
2006	• Sets the long-term environmental vision for 2050 • Starts of on-site confirmation program for waste disposal contractors
2009	• Sets medium-term environmental impact reduction goals • Releases Ricoh's first remanufactured digital color multifunction printers
2012	• Adoption of electric furnace steel plate made from 100% recycled steel scraps
2014	• Launches Silicone-top Linerless Label
2015	• Signs a contract to become an official partner of COP21
2016	• Opens Ricoh Eco Business Development Center
2017	• Sets the Ricoh Group Environmental Goals for 2030/2050 • Becomes the first Japanese company to join RE100 • Ricoh's Zero-Carbon Goals obtains "2.0 degree" approval by the Science Based Targets Initiative (SBTi)
2018	• Establishes the ESG Committee • Commits to recommendations of Task Force on Climate-related Financial Disclosures (TCFD)
2019	• Establishes the Risk Management Committee • Implementation of 100% renewable energy at A3 Multifunction Printer production sites worldwide • Discloses information in accordance with the TCFD Framework
2020	• Establishes a Plastic Policy for products and packaging materials • Revises Environmental Goals for 2030 and obtains "1.5 degrees" approval by the Science Based Targets Initiative (SBTi) • Revises medium- to long-term environmental impact reduction targets (sets target of virgin material usage rate)
2021	• Revises 2030 target to 40% reduction in Scope3 (compared to 15 years) and 50% renewable energy ratio • Introduces of a comprehensive evaluation system for renewable energy
2022	• Publishes Japan's first* Circular Economy Report based on guidance published by the Japanese Government to promote disclosures and engagement concerning sustainable finance models.
2023	• Released an A3 Color Multifunction Printer with the industry's highest level of plastic recycling material integration

*Based on our own research

For comments and inquiries concerning this report,
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