Zero waste 102-15, 103-1 ,306-1 (Waste 2020)

Besides reducing the usage of raw materials and plastic as far as is possible while ensuring that product users can use the products properly, we are also promoting the reuse and recycling of used packaging and unused materials and products, and working actively to promote a resource-circulating society.

ESG Keyword | The 4R principles (reduce, replace, reuse, recycle) | Climate change mitigation and adaptation | Realizing the resource-circulating society | Initiatives to reduce plastic usage | Reducing food waste | Initiatives that address both products and packaging

Kao's creating value to address social issues

Social issues we are aware of

Considering that the world's resources are limited, standards of living are rising, and the resources needed are steadily increasing as the global population continuously grows, the one-way economic models of the past will no longer support prosperous lifestyles and culture into the future. Consequently, efforts to achieve high levels of economic growth and create resource-circulating societies, in other words, to develop circular economies that seek compatibility with high resource productivity, are gaining momentum around the world.

In regions where social infrastructure (i.e., waste treatment systems) is not sufficiently developed for the increases in the amount of waste generated including household waste, there are numerous instances of environmental pollution due to waste being dumped or insufficiently treated at disposal facilities. In addition, improper conduct by consumers after use results in waste dumped on land entering the oceans. Plastic in particular does not decompose naturally, and the volume of marine plastic waste continues to increase. Estimates are that by 2050, there will be more plastic in the ocean environment by weight than the weight of all the fish in the oceans. This marine plastic is starting to have detrimental impacts on marine ecosystems.

To keep the temperature rise due to climate change under 1.5°C, consumption of fossil fuels must be drastically reduced. Consequently, production of plastics, which are made from fossil fuels, may fall dramatically compared to current levels. It is clear that existing plastic containers made with large amounts of fossil fuel derived plastic are not sustainable.

Although fossil fuel usage fell in 2020 due to the impact of the COVID-19 pandemic, it will be necessary to keep fossil fuel use under control and address the rising demand for plastics in order to strike an appropriate balance between fostering economic recovery and the transition to a decarbonized society. In light of this situation, we recognize the growing importance of reducing plastic usage and of recycling.

Currently, because there is a stable supply of plastic products and packaging, and because they are reasonably priced, lightweight, multi-functional and corrosion-resistant, they play an indispensable role in realizing consumers' Kirei Lifestyle. However, because plastic products and containers are mostly made from fossil fuels, if they are not disposed of properly after use they can cause environmental problems.

An additional issue is that, currently, around one-third of all food produced in the world is thrown away as waste. Given that around 8% of annual GHG emissions derive from food waste, there is a clear need to reduce the amount of food that is wasted.

Zero waste 102-12, 102-15, 103-1, 103-2, 306-1, 306-2 (Waste 2020)

Kao's creating value

We are continuously implementing 3R activities to reduce, reuse and recycle waste generated at plants, distribution sites and offices and with regard to products and packaging.

In the area of plastic packaging in particular, we are undertaking ongoing development and use of film packaging that use about one-sixth of the plastic, and products in refillable film packaging are becoming popular in Japan. We are rolling out these technologies to overseas group companies, making it possible to reduce the amount of plastic used in packaging. It goes without saying that if other companies also use these products, the effects will be even more substantial.

Furthermore, efforts to recover waste that has already been released into the environment greatly contribute to the protection of marine and land ecosystems.

Risks related to realization of What Kao Aims to Be by 2030

Items	Contents
Policies, laws and regulations	Stricter regulations on the processing of waste generated at worksites, increased regulation on consumption of plastic packaging (mandatory use of recycled plastic, taxation), mandatory labeling of information on plastic use, etc.
Technology	Increased volumes of waste generated from worksites in conjunction with the manufacture of new products and unsuccessful attempts to develop technology for reducing plastic consumption or using recycled plastic
Markets	Higher disposal costs as a result of increases in the volume of waste generated in excess of disposal capacity throughout society, changes in consumer preferences, rising costs for virgin plastic or recycled plastic, increased consumption of hygiene-related product packaging due to enhanced consumer hygiene awareness resulting from the COVID-19 pandemic, etc.
Reputation	Criticism of the industry or of individual companies, stronger concerns among stakeholders, changes in consumer preferences, etc.

Opportunities related to realization of What Kao Aims to Be by 2030

Items	Contents
Resource efficiency	Lower disposal costs as a result of decreases in the volume of waste generated from worksites and lower costs for packaging, better transportation efficiency, etc. as a result of reducing plastic consumption
Products, services	Reduction in the volume of waste generated through the development of resource-saving products, higher sales due to expanded use of packaging using less plastic and development of innovative packaging, higher income due to licensing of development technology
Markets	Higher sales due to improved access to new markets, use of public incentives for developing innovative technologies, etc.
Resilience	Improved resilience through actively continuing to promote 3R activities for plastic packaging, and by providing even more environmentally friendly plastic packaging, rather than merely returning to the situation that existed before the COVID-19 pandemic

Contributions to the SDGs

Policies

We believe that, in all processes from new product development through to disposal of used products, we should make an ongoing effort, as far as possible, to reduce the quantity of product that is subject to being disposed of and recycled, and that with respect to product that does require disposal or recycling, we should try to recycle as much as possible, and ensure that the product which cannot be recycled is disposed of appropriately.

In accordance with our Basic Principle and Basic Policies on Environment and Safety, we are working to develop technologies that take into consideration resource conservation, energy conservation, waste and byproducts reduction and other issues in the product design stage. In production, we are taking measures to efficiently use resources and energy and to reduce, reuse and recycle waste and byproducts. Furthermore, the Kao Responsible Care Policy contains the following declaration: "We shall reduce, reuse and recycle waste and strive to continuously reduce environmental impact."

Our Environmental Statement embodies our commitment to ensuring that "Kao products utilize original Kao-developed technologies to minimize the impact they have on the environment, not just in the manufacturing process, but in the daily life of the customers who use them. From materials procurement and manufacturing, to distribution, sales, use and final disposal, we want to engage in 'eco together' with stakeholders and consumers worldwide."

With the aim of realizing these policies in concrete terms, in October 2018 we announced Our Philosophy & Action on Plastic Packaging, which clearly enunciates that our action on plastic packaging is driven by our 4R (reduce, replace, reuse, recycle) programme based on continuous improvement and bold innovation.

In September 2019 we announced that, as part of our efforts to realize ESG-driven *Yoki-Monozukuri*, we would be taking responsibility for our products not only until they are sold, but until they are disposed of, and that we would be focusing heavily on Innovation in Reduction and Innovation in Recycling aimed at building the plastic resource circulating society. In May 2020, we established the Recycling Science Research Center in our R&D Division to drive business development with a plastic resource circulating model. To realize our vision,

Zero waste 103-2, 306-2 (Waste 2020)

we are collaborating with other business enterprises, local governments and universities as we seek to realize a resource-circulating society.

A further point is that food waste connected to our businesses is of relevance to Kao's beverage business. In regard to food waste, we are working to reduce the amount of waste generated as much as possible, and striving to ensure that when the generation of waste is unavoidable, this waste is recycled.

➡ p. 117 RecyCreation activities

➡ Our Philosophy & Action on Plastic Packaging
www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/plastic-packaging-001.pdf

➡ Kao's New Challenges for the Future
www.kao.com/global/en/news/business-finance/2019/20190926-001/

➡ Basic Principle and Basic Policies on Environment and Safety
www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/environment-safety-principle-policies.pdf

➡ Kao Responsible Care Policy
www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/responsible-care-policy.pdf

➡ Kao Environmental Statement
www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/environmental-statement.pdf

Efforts in raw materials procurement

To reduce waste generated at our plants, we continuously work with external suppliers to adjust the volume and frequency of raw materials deliveries. This contributes to reducing the amount of packaging materials our suppliers procure as well as reducing CO_2 emissions from the transport of raw materials.

Measures taken in relation to our products

We offer products such as disposable diapers and cleaning sheets that become waste after consumer use. While ensuring product performance, we are developing technologies to reduce the amount of materials used in products and contribute to reducing waste in order to reduce the amount of waste generated after product use. This also reduces costs and CO_2 emissions in conjunction with waste processing.

We also use recycled plastic for some of our products. As a result, we are able to reduce the amount of virgin plastic used, which leads to a reduction in the use of fossil fuels, the raw material for plastic. We are aware that these measures are important for solving the problem of plastic and creating a decarbonized society.

In addition, we are making a switch concerning the eye-catching plastic stickers used on products to attract consumers' attention to certified paper when they absolutely must be used and eliminating all other use by the end of 2021.

Initiatives targeting packaging

Kao undertakes measures in compliance with the ISO 18600 series standards for packaging and the environment. Specifically, we are reducing the amount of materials used in packaging, and in particular we are reducing the use of plastic packaging, which has become a serious issue for society, by adopting a 4R (reduce, replace, reuse, recycle) approach from an Innovation in Reduction and Innovation in Recycling perspective.

Innovation in Reduction

This involves initiatives to reduce the amount of fossil fuel derived virgin plastic used.

• Reduce

We are continuing to take steps to make containers and packaging thinner, as a means of reducing the amount of plastic used in individual products.

• Reuse

We are promoting the adoption of refill and replacement products. The use of plastic film packaging enables us to slash the use of plastic to just one-sixth compared to plastic bottles. To expand the use of film packaging, we have continued to make improvements to these refill products according to bottle size, the viscosity of the contents and so on to make refilling easier for consumers, and we encourage the internal and external use of innovative film packaging. We are exploring the possibility of in-store refilling whereby consumers bring packaging to the store and purchase only the products they are filled with. In addition, we have adopted a "take-back" system for some products, whereby we take back used containers from customers and then clean them and re-use them.

Zero waste 103-2, 306-2 (Waste 2020)

• Replace

We are working to replace fossil fuel derived plastics with alternative materials such as paper and glass as well as recycled plastic and plant-derived plastic. We have been using recycled paper for the carton boxes and instructional inserts for many products, including powdered laundry detergent, since the 1960s, and we plan to expand their use.

Innovation in Recycling

This involves initiatives to recover used packaging and recycle it to create recycled plastic.

• Recycle

Recycling includes initiatives to develop packaging that is easy to recycle. Based on the fundamental technology that we have accumulated until now, we are focused on creating innovative recycling technologies for used plastic, developing and using high-quality, low-cost recycled plastics, encouraging activities that generate value from used plastic, and using plastic waste for industrial applications. We are also undertaking initiatives to replace refill packaging made from multiple layers of different plastic materials with a single material.

We are establishing a framework to recover used packaging and recycle it.

Efforts in development, manufacturing and sales

We are reducing the amount of waste generated at our plants and offices, and we are reusing and recycling waste and other materials inside and outside the company. We have set reduction targets for how much waste we generate and are working company-wide to achieve them.

At plants, we are reducing loss of raw materials and products. For example, for liquid products, wastewater sludge is produced as a result of cleaning the mixing and storage tanks at the production facility when the product produced is switched. For sheet-type products, a portion of the sheet material is left unused when the material is switched out. We are studying loss reduction countermeasures on an ongoing basis according to the type of loss that occurs. We then implement improvements to reduce waste.

Because products that are returned from stores are ultimately disposed of as waste, considerable expense and environmental burdens arise including the waste of resources and GHG emissions during the disposal process as well as considerable disposal-related expense. Going forward, we will work with stores to review product shipping and stock replenishment methods in an effort to minimize waste.

In addition, sales promotion materials are discarded after use, so we are making a transition to disseminating information using digital means.

Enhancing waste recycling

It would be difficult to reduce generated waste to zero with currently available technology. Accordingly, we ensure that generated waste is thoroughly sorted, and we select the most appropriate recycling methods in cooperation with contracted waste treatment providers. We monitor the amount of waste recycled and sent for final disposal along with the amount of waste generated to improve how waste is treated overall.

Preventing illegal dumping of waste

When contracting waste treatment service providers to dispose of waste generated at our plants and offices, there is a risk of illegal dumping. To reduce this risk, we regularly visit the service providers to verify that the contracted waste is being disposed of appropriately. The Kao Group in Japan has created a database containing information including contracts with waste treatment service providers and the results obtained from surveys of appropriate waste treatment to prevent illegal dumping. This system is also connected to the Electronic Manifest System, which also ensures prevention of illegal dumping.

Proper storage and treatment of PCB waste

Polychlorinated biphenyls (PCBs) were formerly used in insulating oil, such as in transformers and ballasts, but they have low degradability and therefore pose a risk to human health and can create hazards in living environments. We appropriately store and treat PCB-containing waste in accordance with the law until its disposal is contracted to a service provider.

Reducing food waste

We are working with the business partners of our Beverage business to review the rules governing product returns for products that are nearing their expiry date. Some returned products can be utilized effectively in methane fermentation and composting. Through activities such as these, we are taking steps to reduce food waste.

Zero waste 102-20, 102-43, 103-2, 306-2 (Waste 2020), 404-2

Education and promotion

Many of our products become waste after use. We are facing this fact earnestly and recognize the importance of giving our employees the chance to learn about the generation of waste from our business activities and used products through various programs and to actively engage in waste reduction measures of their own accord. To this end, we have created many opportunities for employee education.

If, in addition to plants' waste reduction activities and technology development that is oriented toward using fewer resources in manufacturing, there is also a strengthening of employees' waste awareness, then this will help to enhance Kao's activities in this area. A further point is that employees are also consumers, and in their role as consumers it is important that they choose products more carefully and take steps to deal with waste properly.

With regard to packaging, our research laboratories, Procurement, SCM, Business divisions, the ESG Division, etc. engage in a periodic exchange of views regarding Kao's strategy in this area, the issues faced, and how to address them.

Collaboration and engagement with stakeholders

We recognize that, in order to help consumers realize the Kirei Lifestyle, it is vital for us to deepen mutual understanding with a wide range of stakeholders and collaborate with them, by developing mutual communication.

As the waste generated by our production activities impacts on local communities, having good communication with local communities is also vitally important. Many of our plants compile an annual environmental report, and communicate with local residents.

Methods of processing waste generated from our business activities as well as waste generated by consumers and customers after using our products are regulated by government agencies. In order that more waste can be recycled, and to make the processing of waste easier, lobbying undertaken in collaboration with industry organizations is very important.

It is also vitally important to share ideas with suppliers and undertake collaborative R&D with them, in order to reduce the amount of plastic used in packaging and enhance its recyclability.

To realize a Kirei Lifestyle for consumers, a change in consumers' behavior is needed. We provide opportunities to think about the Kirei Lifestyle through visits to museums and plants that take Kao products as the theme. This visit program includes displays that enable participants to get a real feel for the amount of waste generated from products manufactured using limited amounts of resources.

Framework

Management of waste generated from business activities is carried out by the Internal Control Committee and management of waste generated from used products as well as packaging is conducted by the ESG Committee under the supervision of the Board of Directors. These committees are headed by the President and Chief Executive Officer.

The officer responsible for the Corporate Strategy Department serves as chair of the Responsible Care Promotion Committee, and the Corporate Strategy Department of the Responsible Care Division serves as the Secretariat for the committee. The committee meets twice annually to report on and discuss the state of compliance with laws and regulations at all worksites throughout the world, the amount of waste generated, the status of recycling and other matters, and sets targets for the following year. The Responsible Care Promotion Committee conducts monthly checks on compliance with laws and regulations, monitors waste amounts and the status of recycling, mainly at plants which have a large impact, and reports on these and other matters to the head of the committee, committee members, members of the Internal Control Committee, auditors and others.

Activities related to waste issues are reported at the Japan RC Meeting and Global RC Meeting under the supervision of the Responsible Care Promotion Committee. The SCM Division, which manages our plants that account for the majority of waste generated by our plants and offices, holds the

Zero waste 102-20, 103-2, 306-2 (Waste 2020)

Environment Working Group Meeting with environmental staff at all plants, manages progress relating to activity targets regarding recycling and reducing waste at plants, and internally develops Best Practices.

The Internal Control Committee meets one or more times each year, receiving activity reports from the Responsible Care Promotion Committee and other subordinate committees that it oversees and auditing the activities of those committees.

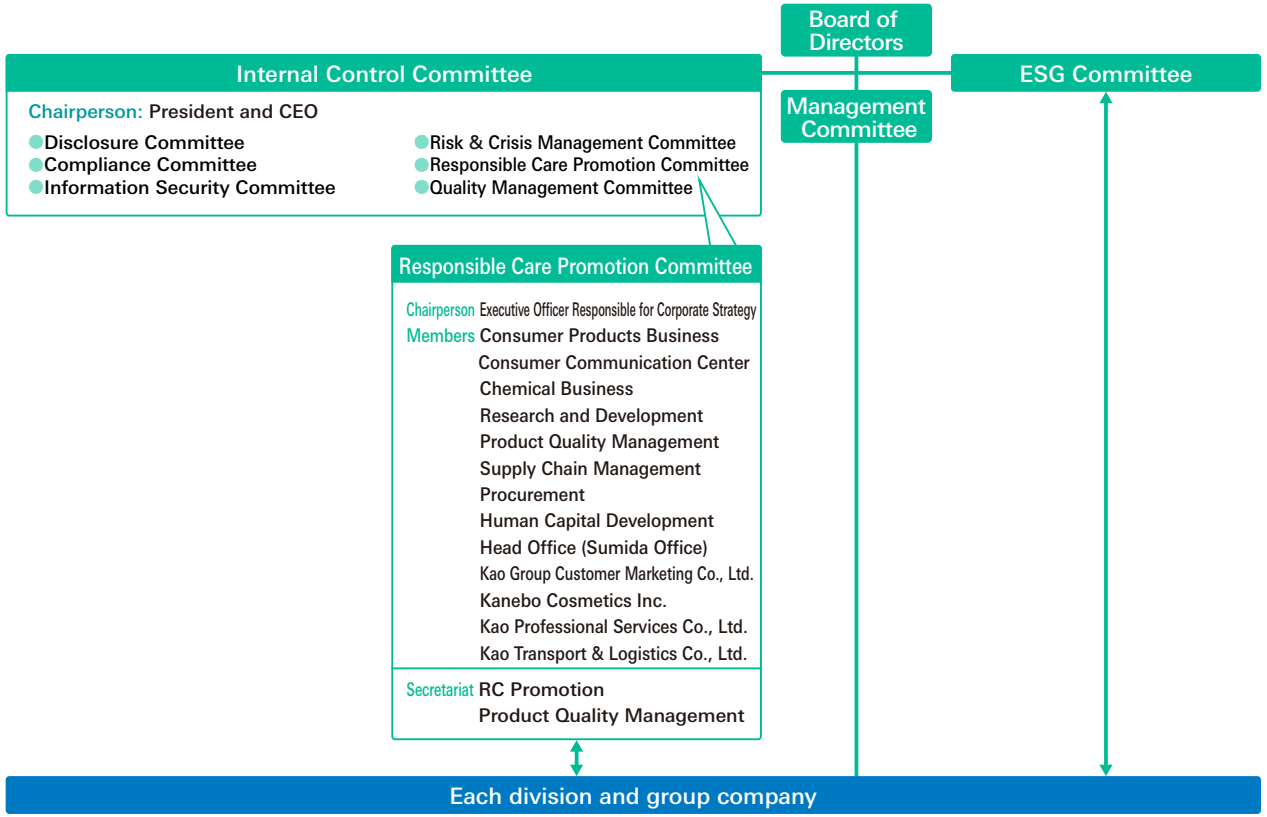
Management of waste generated from used products is handled by the ESG Committee, which meets four times a year. Committee members are the persons in charge of the business, Sales, R&D, SCM and other divisions, an arrangement which connects divisions horizontally. The Internal Control Committee and the ESG Committee under it supervise and discuss environmental issues including waste derived from packaging as well as social and governance issues.

Site inspections of waste treatment service providers are conducted systematically in cooperation with the SCM Division, Procurement Division, Logistics Division, Enterprise Information Solutions Division, Sales Division and related companies.

Data reliability is ensured by using a database that centrally manages environmental data for all Kao group sites throughout the world, and by standardizing tasks and making them more efficient, we are able to conduct activities properly.

➡ p. 18 ESG promotion structure

Waste, Container and Packaging Management Systems



* As of December 2020

Zero waste 103-2, 103-3, 306-2 (Waste 2020)

Mid- to long-term targets and performance

2020 and 2021 targets

Index	Scope	2020 targets	2021 targets
Generated waste and other unwanted materials*1	All Kao Group sites	33% reduction	
Final disposal ratio*2	Kao Group in Japan	0.1% or lower	0.1% or lower
% of products which have abolished plastic-made eye-catch stickers	Consumer products of the Kao Group	—	100% (When stickers are absolutely necessary, certified paper will be used)

*1 Per unit of sales (2005 baseline)
*2 Ratio destined for final landfill disposal to the amount of generated waste

2025 mid-term targets

Index	Scope	Targets for 2025
Practical use of innovative film-based packaging made from collected pouches	Kao Group	Products launch

- Develop film packaging made from a single material
- Shift to 100% recyclable, reusable packaging
- Consumption of recycled plastics: x5
- Consumption of bio-based plastics: x3
- Recycled PET used for all household product PET bottles (in Japan)

2030 long-term targets

Index	Scope	Targets for 2030
Quantity of innovative film packaging penetration	Kao Group and other companies	300 million products*1
Amount of waste*2	All Kao Group sites	Zero

*1 Annual penetration amount
*2 Amount of waste not recycled from business sites

The following targets were scheduled to be disclosed in 2022:

- Use of PCR (recycled plastic) for PET containers
- Reduction from discarded products and discarded sales promotion materials

Anticipated benefits from achieving mid- to long-term targets

Business impacts

It will be necessary to raise productivity in order to curtail the amount of waste and the like generated from business activities. If productivity is raised, manufacturing costs can be reduced. In addition, promoting recycling can also be expected to reduce waste processing costs.

By using innovative film packaging both internally and externally and meeting our targets for reducing plastic consumption, we can boost sales in new markets and earn revenue from licensing our patents.

By increasing consumption of recycled and recyclable plastics, we can also avoid new taxes on the use of virgin plastic.

Social impacts

By curtailing waste and the like generated from business activities, promoting recycling to achieve zero waste, and developing a society where innovative film packaging that can drastically reduce the amount of plastic used are widespread both inside and outside Kao Group will contribute to enhancing resource productivity throughout society as a whole. Doing this will contribute to realizing a resource-circulating society and make it possible to offer consumers clean products in a future society with limited resource availability. These are important approaches for carrying out the Kirei Lifestyle and achieving One Planet Living vision.

Zero waste 301-2, 306-1, 306-2, 306-3, 306-4 (Waste 2020)

Performance in 2020

Performance

Amount of generated waste and other unwanted materials

In 2020, our activities were aimed at realizing a target of reducing the amount of waste generated by 33% compared to 2005. As a result of reduction efforts at our worksites, the amount of generated waste and other unwanted materials came to 210 thousand tons, representing a decrease of 15 thousand tons compared to the previous year. Due to a fall in sales, the reduction rate (per unit of sales) was 26%, which was 1 percentage point worse than in the previous year. We will continue to strengthen our activities to reduce generated waste and other unwanted materials.

Of the generated waste, 39 thousand tons were hazardous waste. No hazardous waste was transported internationally under the Basel Convention.

Recycling

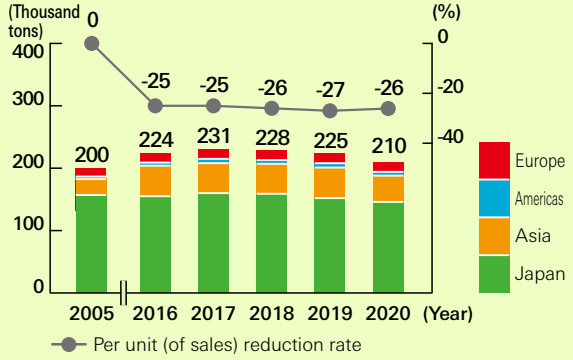
Waste reused or recycled* came to 192 thousand tons ☑, a recycling rate of 92%.

We maintained our target of a 0.1% or lower final disposal ratio for waste. We have achieved our target of zero emissions for the 16th consecutive year since the target was set (final disposal ratio to generated waste for all Kao Group worksites in Japan).

Starting from 2021, as a new zero waste indicator, we have begun to calculate a combined landfill disposal (direct disposal by landfill without special processing) and incineration rate, and we are aiming to reduce this rate to under 1% by 2025.

* Includes thermal recycling (heat recovery)
  Assurance provided for amount of generated waste since 2015

Amount of generated waste and other unwanted materials ☑ (all sites)



* Boundary: For 2005, all Kao Group production sites, and all non-production sites in Japan. From 2015, some non-production sites outside Japan are also included.
* Assurance provided for amount of generated waste and other unwanted materials.
* Per unit of sales was calculated based on Japanese GAAP in FY2005, and based on International Financial Reporting Standards (IFRS) from FY2016 onwards.

Food waste

Since 2018, we have been implementing activities to reduce food waste. In 2020, the amount of food waste disposed of by the Kao Group as a whole totaled 592 tons, of which 27 tons were utilized effectively for methane fermentation or composting. We have also been working together with our customers to revise the rules relating to the return of products that are approaching their expiry date.

Changes in Amount of Food Waste (in tons)*1

Item	2017	2018	2019	2020
Amount of food waste generated	4,031	1,081	251	592
Amount effectively utilized (methane fermentation or composting)*2	664	54	20	27
In-house disposal	3,366	1,027	230	565

*1 Scope of total given: Kao's food businesses
*2 Processing contracted out

Inspection of waste treatment facilities

In 2020, due to the impact of the COVID-19 pandemic, the number of waste treatment facilities at which on-site inspection could be performed was lower than in previous years. However, by using documentary review, etc. we still managed to evaluate a total of 86 facilities (in Japan), thanks to collaboration from 70 waste treatment companies. The evaluation results showed that there were no waste treatment companies that did not meet Kao's evaluation criteria.

Eye-catching stickers

The use of eye-catching plastic stickers was reduced by 73%.

Develop film packaging made from a single material

Development of film packaging made from a single material is underway in collaboration with film makers and converters.

Shift to 100% recyclable, reusable packaging

Plastic packaging used for household products in Japan is required by the Act on the Promotion of Sorted Collection and Recycling of Containers and Packaging to have a framework in place for recycling. Kao's plastic packaging is thus already 100% recyclable.

Outside Japan, definitions of what constitutes recyclable packaging vary depending on the country or region, and recyclability also depends on the recycling systems that exist in each country or region. We are therefore working to confirm not only packaging specifications but also the sales areas for each type of packaging.

Zero waste 102-48, 301-2

ZERO WASTE

Amount of recycled plastic used

Recycled plastic made from used plastic is utilized for shampoo, conditioner and body wash products by Kao (Taiwan) Corporation, and it is also used by the salon-oriented *Kerasilk* brand in Europe and by the *Oribe* brand in the U.S., etc. The total amount of recycled plastic used in 2020 was 427 tons (1.3 times as much as in 2019).

Amount of bio-based plastics used

Bio-based plastics are used for *Merit* shampoo and conditioner, *Segreta* shampoo and conditioner, *CuCute* 1,380ml containers, *Raku-raku Eco Pack Refill*, *andand* shampoo and treatment, and other products, and the total amount used has reached 519 tons (1.1 times the amount in 2019).

Quantity of innovative film packaging penetration

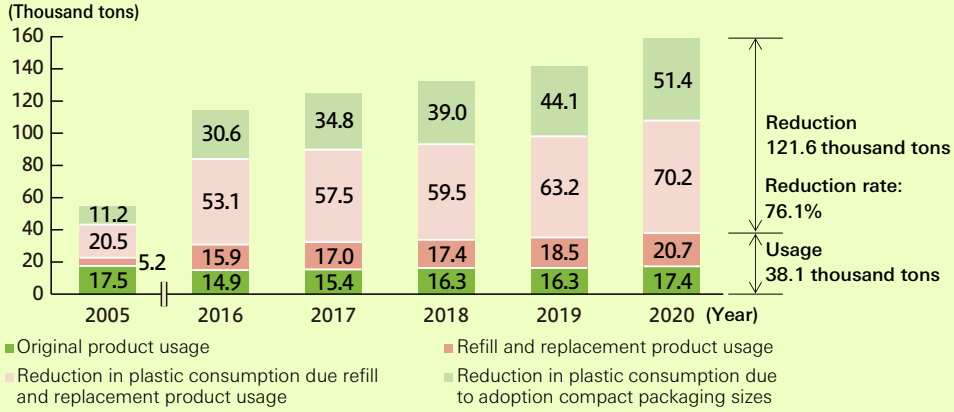
In 2020, the total number of products manufactured using innovative film packaging, calculated as a combined total for *Raku-raku Switch*, *Air-in Film Bottle* and *Tube-Like-Pouch*, was approximately 1 million items.

Amount of packaging used

Kao Corporation now offers 370 refill and replacement product (as of December 2020), with a penetration rate of 83% and slightly more than 80% recently. The refill ratio for fabric bleach in particular now stands at more than 90% (unit basis).

Plastic consumption has been reduced by 70.2 thousand tons through the use of refill and replacement products. If the impact of making products more concentrated is also factored in, then the overall amount of reduction was 121.6 thousand tons, and the reduction rate (compared to if the products had been packaged in the original plastic packaging) was 76.1%.

Usage and reduction volume of plastic in refill and replacement categories



* Scope: Kao Corporation

* Body wash, hand soap, shampoo & rinse, liquid laundry detergent, fabric softener, kitchen cleaner, household cleaner, bleach, mold remover

* The data originally given for 2019 contained errors, which have been corrected.

Amount of plastic packaging used per product

The amount of plastic packaging used per product varies by region, at 0.36g in Japan, 0.84g in the Asia region, and 0.78g in Europe and the Americas. These figures are for comparable products in the household-use shampoo and rinse category.

We are aiming to reduce the amount of plastic packaging used per product through the widespread adoption of innovative film packaging and of refill and replacement products.

Zero waste 102-43, 301-2, 301-3, 306-2 (Waste 2020)

Our initiatives

Measures taken in relation to our products

Reducing the amount of product materials used

We continue to reduce the materials used in making products that become waste after product use by consumers. For example, we reduced the product weight of medium-sized *Merries* disposable taped diapers by 37% while improving product function compared to its 1990 version.

Paper hot water pipes

Paper hot water pipes handled by Chemical Business combine molding technologies with high-temperature material technologies and are made from waste paper. Compared to general ceramic hot water pipes, the amount of raw materials used is reduced to one-tenth and post-use waste to one-sixteenth.

Products that use recycled materials

We use recycled materials for some of our products. We have been using recycled paper in the carton boxes and instructional inserts of many products since the 1960s, including powder-type clothing detergents. We use recycled polypropylene (PP) in the measuring spoon for *Attack* powder type laundry detergent, which was first put on the market in 1987, and recycled polyethylene terephthalate (PET) in the fibers of *Quickle Wiper* floor dry cleaning sheets, which first appeared on the market in 1994.

Using waste PET to make *NEWTLAC 5000* asphalt modifier

Chemical Business has used Kao's proprietary modification and compounding techniques on discarded PET materials (waste PET) to develop *NEWTLAC 5000*, a new type of asphalt modifier, through upcycling. The full-scale commercial launch of the new product took place in late 2020.

Besides improving the durability of road surfaces in the same way as conventional asphalt modifiers, because *NEWTLAC 5000* uses waste PET, the disposal of which has become a problem for society, it makes it possible to create asphalt road surfaces that are not only durable but also environmentally friendly. (Approximately 1,430 PET bottles are used in surfacing an area of road of 100m^2)

Recycling of used disposable diapers

Field testing of technology to convert used disposable diapers into carbon material began in January 2021, in collaboration with Saijo City, Ehime Prefecture, where Kao Sanitary Products Ehime is located. We have developed carbonization technology that reduces the amount of CO_2 emitted during recycling, while also sterilizing and eliminating odor, and reducing the volume occupied by the recycled material. We are proceeding with activities to develop applications for the carbon material obtained through recycling, including industrial uses, air and aquatic environment purification, and plant cultivation.

The recycling system development was undertaken through joint research with Kyoto University Open Innovation Institute.

Initiatives targeting packaging

Initiatives to reduce *Smart Holder* and *Raku-raku Eco Pack Refill*

In 2017, we proposed *Raku-raku Eco Pack Refill*, which can be used with our *Smart Holder*, improving usability and allowing the product to be completely consumed, thus reducing environmental impact. This eliminates the need for an original plastic bottle.

Until now, these were sold only on our online site, but we implemented a full-scale rollout to stores in April 2020. We believe this will make them accessible to more consumers and will encourage use.

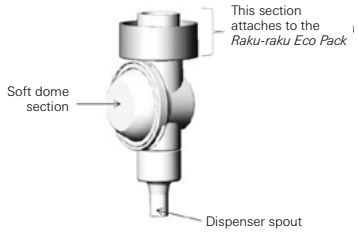
Smart Holder and *Raku-raku Eco Pack Refill*

Zero waste 301-2, 301-3, 306-2 (Waste 2020)

ZERO WASTE

Launch of the *Raku-raku Switch* for dispensing a fixed amount from film packaging with one light push

Bioré u The Body—Body Lotion for Wet Skin, which was launched in September 2020, uses a *Raku-raku Switch* that, when attached to a *Raku-raku Eco Pack*, makes it possible to extract a fixed amount of liquid with just a light touch. Compared to bottles with pumps, *Raku-raku Switch*-equipped products reduce the amount of plastic used by around 50%. From a universal design perspective, these products have the outstanding feature of being easy to use even for people who do not have much strength.



Raku-raku Switch

➡ The following pages have more information about the *Raku-raku Switch*:
p. 56 Making my everyday more beautiful > Universal product design > How the *Raku-raku Switch* and hanging-type pack are used
p. 64 Making thoughtful choices for society > Sustainable lifestyle promotion > Launch of products using *Raku-raku Switch*

Air-in Film Bottle technology adopted for use in _MyKirei by KAO_ products sold in the U.S.A.

In April 2020, Kao-developed *Air-in Film Bottle* film packaging began to be used for the first time for *MyKirei by KAO* products sold in the U.S.A. The film is the same kind of soft material used in refill packaging. The bottles gain their rigidity through an air fill, allowing them to stand upright, and compared to conventional pump bottles, they use approximately 50% less plastic. Additionally, compared to conventional bottles there is less liquid left in the bottles when they are disposed of.

MyKirei by KAO

➡ For more information about *MyKirei by Kao*, see p. 72 Making thoughtful choices for society > Purpose driven brands > *MyKirei by KAO* (by KAO USA in the U.S.)

Tube-Like-Pouch (TLP) film packaging adopted for _John Frieda_ products sold in the U.S.A.

Starting from July 2020, we began using the Kao-developed *Tube-Like-Pouch* film container for some *John Frieda* hair care products for both in-store and online sales (via Walmart.com) at the U.S. retailer Walmart on a limited-edition basis. *Tube-Like-Pouch* uses material that has previously mainly been used in film packaging for refill packs as the original product container. As a result, the amount of plastic used is reduced by 50% compared to conventional bottles, and nearly all the liquid can be dispensed from the container.

Tube-Like-Pouch

Total elimination of eye-catching plastic stickers

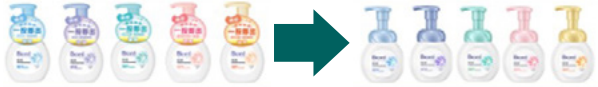
Eye-catching plastic stickers attached to products provide consumers with information on product advantages and correct usage at the time of purchase, but they increase the amount of plastic used, and the increase in plastic waste and CO_2 emissions at the time of disposal is an issue.

As a result, we are working to completely eliminate the use of eye-catching plastic stickers. In 2020, besides products sold in Japan, we also

Zero waste 301-2, 301-3, 306-2 (Waste 2020)

proceeded with extending implementation of this program to include products sold overseas, including body wash produced in Vietnam, foam-type facial cleanser produced and sold in China, and makeup remover produced and sold in Indonesia, etc.

Body wash produced in Vietnam



Foam-type facial cleanser produced and sold in China

Makeup remover produced and sold in Indonesia

Initiatives to replace

Use of recycled plastic

We are increasing the use of recycled plastic for packaging around the world.

In 2020, new containers made using recycled plastic were launched for the *Kerasilk* brand, which is oriented toward the salon market in Europe, and for the *Oribe* brand in the U.S.

Kao Shampoo, *Kao Body Wash*, *Bioré Prime Body*, and *Men's Bioré Shampoo* in Taiwan:
Adopted packaging using 100% recycled plastics since 2016

Kerasilk brand, oriented toward the salon market in Europe:
Starting from 2020, plastic containing 50% recycled polyethylene terephthalate (PET) has been used for hand wash and hand lotion containers.

The Foundations and *The Amplifiers*, *Oribe* brand salon products in the U.S.:
Starting from 2020, plastic comprising 100% recycled polyethylene terephthalate (PET) that was recycled in the U.S. has been utilized for in-store bottle use, allowing bottles to be continuously recycled.

Quickle Wiper Wet Sheets (in Japan):
Packaged in bags that are made from 80% recycled plastic

Use of bio-based plastics

We are actively developing technologies for using bio-based plastics for bottles and refills. Since we began this initiative in 2012, our consumption of bio-based plastics and the range of products for which they are used have continued to expand.

For example, *Raku-raku Eco Pack Refills* are made from 15% bio-based plastic on a weight basis.

Products using packaging made from bio-polyethylene

Zero waste 102-43, 301-2, 301-3, 306-2 (Waste 2020)

ZERO WASTE

Initiatives to Reuse (promoting the adoption of refill and replacement products)

We continue to provide refill and replacement products and expand sales of *Smart Holder*.

Refillable in stores

At *Molton Brown*, following on from the packaging reduction initiative implemented in 2019 (specifically, in-store refill for Eau de Toilette and Eau de Parfum), starting from 2020, reusable glass bottles and *Fine Liquid Hand Wash Refills* have been on sale both in-store and online in Europe and in the Americas. The amount of plastic used in making a refill pouch is 80% less than the amount used in 2 conventional 300ml bottles, so it is anticipated that this initiative will help to reduce single-use plastic usage and reduce the volume of waste.

Reusable glass bottle and *Fine Liquid Hand Wash Refill*

Printer head refurbishment

In 2012, Kao Collins launched a refurbishment program for some inkjet printer heads that are no longer usable. This initiative has reduced the number of printer heads that are discarded, and has led to a reduction in the environmental impact.

Take back system creation

Chemical Business is conducting a program to reuse sold product packaging (take back system) to reduce their environmental impact. In 2020, a total of 17,455 1-ton containers (IBC containers) used for corporate customers were collected for reuse.

Assessing the environmental impact of initiatives to promote the adoption of refill and replacement products

In 2019, working in collaboration with Professor Norihiro Itsubo of the Faculty of Environmental Studies, Tokyo City University, we used the LIME3 method to conduct an environmental assessment of the use of refill packaging, which is widely used in Japanese society. Results of the assessment indicated that societies that use refill packaging have a lower environmental impact than societies that recycle original plastic packaging.

Initiatives to recycle

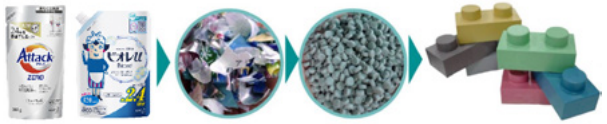
RecyCreation activities

We have been engaged in research toward creating a new resource recycling system for packaging. We have proposed the RecyCreation approach, which generates new value by adding technology and the knowledge and ideas of various people to used items. To date, we have continuously conducted verification in five areas with members of the community.

In a trial, we collected used refill packs for laundry detergent, shampoo and other products from members of the community and recycled them to create a block of recycled plastic that symbolizes “creation” of various objects and values that will be useful for community development and lifestyle development. In September 2020, we made the decision to collaborate with Lion Corporation on RecyCreation, and began field testing at the Ito-Yokado Hikifune store in Sumida-ku, Tokyo of a program to implement in-store collection and recycling of used refill packaging. Going forward, we will be aiming to realize horizontal material recycling that makes it possible for film packaging to be recycled for use in the production of film packaging.

➡ RecyCreation on Facebook
www.facebook.com/RecyCreation.jp/ (Japanese)

The RecyCreation Concept



Used refill packs | Cutting/cleaning | Pelletizing | Recycled into plastic building blocks that can be assembled/reused

Collection box for used refill packs in Ito-Yokado’s Hikifune Store (Outlined in red)

Zero waste 102-43, 301-2, 301-3, 306-2 (Waste 2020)

Commencement of the verification process for a resource-circulating model project involving horizontal material recycling*1 of single-use plastics

In September 2020, Kao was selected by Tokyo Metropolitan Government to be one of the business enterprises involved in the New Business Model for Sustainable Use of Plastics initiative Working together with other participating enterprises and organizations, we will be implementing a resource-circulating model project for horizontal material recycling of single-use plastics.

In the future, by proactively making our voice heard and giving a call to action within CLOMA*2, we will be working to secure the understanding and collaboration of a wide range of stakeholders, and will be proceeding with initiatives that embrace the whole of society.

*1 Recycling of materials into products with the same application
*2 Clean Ocean Material Alliance

Initiatives adopted at our business sites

Reducing the amount of waste produced

We handle a large number of liquid products, and reducing the sludge produced from treating concentrated wastewater generated in the process of cleaning tanks and switching products is a major issue.

Kao Industrial (Thailand) treats wastewater using separate wastewater treatment facilities according to the COD concentration of the wastewater, which has successfully reduced the amount of sludge produced and contributes to reducing waste. Fatty Chemical (Malaysia) has also reduced waste through the adoption of sludge dewatering equipment.

Also, to contribute to reducing the amount of generated waste at retailers, we are working with the understanding and cooperation of retailers to reduce the number of boxes used in the delivery of products.

Employees' voice

Waste reduction activities at Kao Industrial (Thailand)

Dararat Insuwan
Manager of Compliance, Safety and Environment department
Kao Industrial (Thailand)

Around 65% of waste in Thailand is disposed of by landfill. It is the preferred method because it is cheaper than other methods, but landfill disposal has a lot of negative effects on the environment, such as water and groundwater pollution, air pollution, exacerbating climate change, and the risk of spreading infection during a pandemic. So, our goal is to reduce the amount of waste disposed of through landfill by achieving Zero Landfill.

Our efforts to reduce landfill waste have been ongoing, and finally we found that the key to success is "sorting." If we can classify the waste type from the source, then waste management becomes more efficient. The hardest aspect of sorting is how to make everyone understand and cooperate. Just training or one-way communication is not enough. So, we also need to understand the behavior of employees by observing their behavior in the workplace, analyze the root causes and find the solution by discussion and sharing with related parties, while also implementing frequent follow-up.

After sorting, we found that waste from a particular source can be useful to another process. So, Zero Landfill is achieved by sorting out the non-hazardous waste which has heating value to be used as alternative fuel (RDF) or alternative raw material in the Cement Kiln plant process, and sorting out the "concrete waste" incombustible waste from laboratory testing to be used as material for garden decoration by donation to the local municipality. None of the above activities can be successful without the cooperation of all employees and without effective teamwork.

Although we have been successful in realizing Zero Landfill, we are committed to continuing to improve efficiency in waste management by focusing on reducing waste generation at source, following the Zero Waste Management Concept to achieve the Kirei Lifestyle Plan's Zero Waste goal by 2030.

Zero waste 301-3 ,306-2 (Waste 2020), 404-2

Enhancing waste recycling

Waste recycling in manufacturing

One example of this is recycling the waste generated by the manufacture of diaper and feminine products to be turned into plastic pallets. We began test operation of this system at our plants in 2016, with cooperation from research laboratories and related divisions using the strengths of our matrix management.

By 2020, we were able to recycle 772 tons of waste into approximately 49,620 plastic pallets.

Spreading internal awareness of zero waste

Global RC Meeting

As a part of our Responsible Care (RC) measures, RC managers in Japan, and RC managers of overseas subsidiaries with manufacturing plants, hold an annual meeting. The aims are to invigorate RC activities and raise their level including reducing waste produced by subsidiaries.

Unfortunately, in 2020 this activity had to be held through the exchange of documents, because of the COVID-19 pandemic.

RC Environment Committee of the SCM Division

The RC Environment Committee of the SCM Division meets twice annually to gain an understanding of conditions at each plant and share information on best practices with the objectives of curtailing the production of waste from plants in Japan and promoting recycling.

A packaging review meeting

To promote activities and understanding internally, Packaging Technology Research holds packaging review meetings when new and improved products are launched. Members from the relevant divisions, including business units, the SCM Division and the Consumer Communication Center, evaluate the environmental performance of the packaging.

In 2020, a total of 54 meetings were held in Japan, and 4 elsewhere in Asia. All of these meetings were held online.

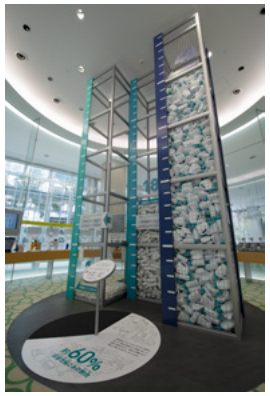
Zero waste 102-43, 308-2

Collaboration with stakeholders based on “eco together”

“eco together” with consumers/customers

Awareness-raising activities at the Kao Eco-Lab Museum

To encourage more consumers to choose refill and replacement products that greatly reduce plastic consumption, overviews of Kao’s packaging initiatives have been presented at the Kao Eco-Lab Museum and at the EcoPro exhibition.



Display enabling visitors to get a real feel for how much plastic is used in packaging

Ways to look after and wash eco-friendly reusable shopping bags to keep them clean

With the rise in awareness and concern for the environment, as well as the fact that consumers are increasingly having to pay for plastic shopping bags, 88% of people reported taking an eco-friendly reusable shopping bag with them when they go shopping (according to a survey conducted by Kao in December 2019).

In relation to new legislation in Japan that came into effect in July 2020, requiring consumers to pay for plastic shopping bags in shops, the Kao Consumer Research Center has posted hints on ways to look after eco-friendly reusable shopping bags, which are now being used more frequently, and to keep them clean, on the life information website (Japanese).

“eco together” with business partners

Recognizing that it is essential to collaborate with manufacturers producing materials, recycled plastics and packaging when developing and launching new packaging, we work together with a wide range of business partners.

“eco together” with society

Clean Ocean Material Alliance

We are participating in the Clean Ocean Material Alliance, which was established to encourage global initiatives for solving the ocean plastic pollution problem. The Kao Corporation Director and Chair is chairman of the alliance, and Kao is taking a leading role among Japanese businesses.

➡ Clean Ocean Material Alliance
cloma.net/english/

Package collection measures

Together with outside organizations, we are involved in recovering packaging, etc. discharged into the natural environment.

In September 2020, we concluded a cooperation agreement with Wakayama City. To protect the ocean from pollution, including marine plastic waste, arising from land-based activities, marine plastic waste collected in Wakayama City are processed into recycled plastic and various uses for the recycled plastic are examined. Kao is also engaging in unique clean-up activities for river and ocean waste and in the community.

Introducing cases at seminars on waste

In Japan, it has been reported that many incidents occur at waste treatment companies, which are caused by not providing sufficient information on the chemical substances to the contractor when contracting the waste treatment.

Therefore, we present cases at various seminars regarding waste with the aims of spreading our knowledge about past successful cases of improving communication with waste treatment companies, and identifying points of improvement in how we communicate information.

Thanks to these activities, there were again no incidents involving waste contracted for disposal from us in 2020.

Zero waste 102-44

Stakeholder engagement

Hopes and suggestions regarding Kao's plan to collect 10 thousand tons of used refill packaging a year in Japan in collaboration with other companies in the industry and with retailers

Masanobu Ishikawa
Professor Emeritus, Kobe University
Specially Appointed Professor, Eikei University of Hiroshima
President, NPO Gomi-Japan

Message from a Kao employee with responsibilities in this area

In 2020, the hope was expressed that Kao would collaborate with a diverse range of organizations in tackling the challenge of material recycling of composite films.

In this regard, in September 2020 we began cross-company collaboration with Lion Corporation on issues relating to film packaging recycling technology, and in November 2020, two companies began to implement a program at the Ito-Yokado Hikifune store in Sumida-ku, Tokyo for in-store collection of used refill packs for recycling.

Going forward, we plan to expand the number of local governments, enterprises and stores with which we collaborate on collection, and we will be proceeding with social implementation of film packaging recycling.

Key aspects of Kao's activities aiming at zero waste

1. High-level commitment
2. Collaboration with other companies in the industry
3. Tackling the challenges of material recycling of composite films
4. Activities in collaboration with citizens, government agencies, retailers, NPOs, etc.

Hopes and suggestions regarding a further deepening and expansion of Kao's activities

1. A further expansion of collaboration
   - 1.1. Expansion of both horizontal and vertical collaboration
   - 1.2. Adoption of collection methods that can be scaled up
2. Value creation
   - 2.1. Thinking about what kind of value you are aiming to create, and for who
   - 2.2. Striving for value creation beyond basic resource value
3. Product design and technology development
   - 3.1. Standardization of refill pouch design on an industry-wide basis
   - 3.2. Setting a mid- to long-term goal of having packaging made from single materials, on an industry-wide basis

Kao made progress in several areas in its activities in 2020. Having set itself ambitious targets, Kao has revised its existing activities so as to achieve these targets, and after putting in place the necessary systems, both internally and externally, the company has achieved steady progress.

The single most important development is Kao's declaration that, as part of RecyCreation activities, it will be working to collect 10 thousand tons of refill packaging per year by 2025, equivalent to around 20% of all refill packaging consumed in Japan. Kao also announced that it would be collaborating on this goal with Lion Corporation, a company with which Kao is in competition. As an example of business enterprises focusing on creating value for society, this initiative has attracted a great deal of attention, and both companies deserve praise for their bold decision.

In addition, an in-store collection field testing project has been launched, in collaboration with the Seven & i Group, at the Ito-Yokado Hikifune store in Sumida-ku, Tokyo, a district with which both Kao and Lion have links in terms of the location of the head office or other worksites. This kind of horizontal and vertical collaboration in the supply chain can be a key factor in the realization of the circular economy. Other companies have talked about doing this kind of thing before, but Kao and Lion are actually putting it into practice, which is very impressive. I hope that, going forward, not only will the two companies, and the Seven & i Group, work to further deepen their collaboration, they will also expand the scope of the collaboration, both vertically and horizontally.

In the RecyCreation activities that had been undertaken up until 2019, collection was implemented using a variety of different collection methods at the local level. With this kind of approach, it would be difficult to collect 10 thousand tons of material annually. The next step must be to develop a collection method that is scalable, and having collection handled in-store by retail stores is an effective way of doing this.

As I see it, there are 3 main obstacles to realizing the sustainable collection of 10 thousand tons of used packaging per year. The first challenge is securing consumers' collaboration. Given the relatively small amount of material involved (compared to the overall volume of household waste), the likelihood of getting government agencies to incorporate this type of collection into regular separated collection of household garbage is low, so it will be necessary to get consumers to bring the packaging material to the collection point. A second obstacle is that, taking consumers' convenience into account, it is not realistic to expect consumers to carry packaging material for long distances, so the collection points need to be distributed in many different locations. If the collected waste then needs to be transported from multiple different collection points, how can this "secondary distribution" be made as efficient as possible? The third challenge relates to what the collected material will be used for.

In order to secure consumers' collaboration, it will be necessary to provide value to the consumers who bring the used packaging to the collection points. It would be wonderful if, as far as possible, the value was provided not just to individual consumers, but to, for example, the community as a whole. The drop-off type waste collection and recycling model that AMITA Corporation has rolled out in Minamisanriku-cho and in Ikoma City has proved that this can be done.

Regarding the second, logistics-related issue, there are ways to solve this problem through inter-company collaboration and innovative approaches to the utilization of digital transformation to effectively utilize delivery vehicles that would otherwise have been empty.

With regard to the third obstacle, relating to how the recycled material is actually used, over the medium to long term the range of applications can be expanded by having refill packaging made from a single material adopted as standard throughout the industry. Taking into account the question of consumer communication and the need for stable demand, it would seem desirable for recycled refill packaging to be used to create raw material for refill packaging.