# Zero Waste GRI 306-1, 306-2

**With the aim of creating a resource-circulating society, Kao promotes the reduction and recycling of resources used for packaging and products that are used in and generated from business activities, and contributes to the sustainable development of its business and society.**

## Social issues

Efforts to build high-level circular economic societies with high-level economic growth are increasingly needed throughout the world. Considering that the planet's resources are limited, standards of living are rising, and the resources needed are steadily increasing as the global population continues to grow, the one-way economic models of the past will no longer support the prosperous lifestyles and culture of the future.

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, we are concerned that improper conduct by consumers after using our products results in waste being dumped on land and entering the ocean, which can lead to the issue of marine plastic pollution.

Currently, there is a stable supply of plastic products and packaging that are reasonably priced, lightweight, multi-functional and corrosion-resistant, so they play an indispensable role in realizing consumers' Kirei Lifestyle. However, many of these plastics are fossil-based and do not decompose naturally unless they are properly disposed of after use, and the volume of marine plastic waste continues to increase. It is estimated that by 2050, there will be more plastic than fish in the ocean, in terms of weight. This marine plastic is starting to have detrimental impacts on marine ecological systems.

To keep the temperature rise due to climate change under 1.5°C and achieve a carbon neutral society by 2050, consumption of fossil fuels must be drastically reduced. Consequently, the production of fossil-based plastics is expected to decrease drastically from the current level. Therefore, it is clear that existing plastic packaging made with large amounts of fossil-based plastics is not sustainable.

In order to both stimulate economic activities and transition to a decarbonized society, the use of fossil-based plastics must be reduced while meeting the growing demand for plastics. In light of this situation, we recognize the growing importance of reducing plastic consumption and of recycling.

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.

We supplied products that included 91 thousand tons of plastic packaging, such as bottles and film-type refill packs. In addition, 714 tons of food waste was generated.

We aim to help realize a zero waste society, not only by minimizing the resources used in all processes from new product development through to disposal of used products, but also by trying to ensure that, after use, all products are reused, recycled, or effectively utilized in some other way. We also believe that, in cases where it is unavoidable for something to be disposed of as waste, it should undergo appropriate treatment.

## Policies

We believe that, in all processes from new product development through to disposal of used products, we should make as much effort as possible to reduce the quantity of products that will be disposed of and recycled, and that we should try to ensure that all waste, regardless of whether it is solid or liquid, is utilized in a way that is useful for society, with the ultimate goal of achieving a net zero waste society. At the same time, as we see it, we should seek to maximize recycled resources, and when the generation of waste is unavoidable, it should be utilized appropriately.

More specifically, we are advancing our efforts in line with the following policies.

• Basic Principle and Basic Policies on Environment and Safety

We have committed ourselves to contributing to social sustainability by giving thorough consideration to environmental conservation and human safety in every aspect of our operations, including product development, production, distribution, usage and waste disposal.

• Kao Group Responsible Care Policy

We have made a pledge to reduce, reuse and recycle waste and strive to continuously reduce our environmental impact.

• Environmental Statement

We have expressed our determination to take advantage of our proprietary technologies to manufacture products that minimize the impact on the environment, not just in the manufacturing process, but in the daily life of the customers who use them. We are also determined to engage in 'eco together' with

# Zero Waste GRI 306-2

various stakeholders throughout the product lifecycle, from raw materials procurement to final disposal.

With the aim of realizing these policies in concrete terms, in 2018 we announced Our Philosophy & Action on Plastic Packaging and stated that we would promote manufacturing from the perspective of 4R (reduce, reuse, replace, recycle). In 2019, we announced that 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 a resource-circulating society for plastics.

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

P140 RecyCreation activities

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

Basic Principle and Basic Policies on Environment and Safety
https://www.kao.com/global/en/sustainability/klp/policy/environment-safety-policy/

Kao Group Responsible Care Policy
https://www.kao.com/global/en/sustainability/klp/policy/responsible-care-policy/

Kao Environmental Statement
https://www.kao.com/global/en/sustainability/klp/policy/environmental-statement/

Announcing a Roadmap for Reaching Plastic Packaging Net Zero Waste by 2040 and Negative Waste by 2050
https://www.kao.com/global/en/newsroom/news/release/2023/20230516-003/

Food waste is of relevance to Kao's beverage business, and 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, the waste is recycled.

## Efforts in raw materials procurement

To reduce the waste generated when transporting raw materials, we continuously work with external suppliers to adjust the volume and frequency of raw materials deliveries.

## Initiatives taken in relation to our products

We offer products such as baby diapers and cleaning sheets that become waste after consumer use. For this reason, while ensuring product performance, we are developing technologies to reduce the amount of raw materials used in products and we are trying to minimize the amount of waste generated after product use. In this way, we are also aiming to contribute to the reduction of costs and $CO_2$ emissions in conjunction with waste processing.

We also use recycled plastic for some of our products. As such, we are aiming to minimize the amount of virgin plastics used and that of fossil fuel, which is the raw material for plastics.

## Initiatives targeting packaging

We are aiming to realize net zero waste for plastic packaging by 2040, and negative waste for plastic packaging by 2050. Zero Waste refers to a situation in which the amount of plastic packaging used by Kao equals the amount of plastic recycling Kao is involved in. We will reduce the amount of plastic used to the maximum extent possible, and then offset this by developing products and services using plastic waste generated by society, thereby reducing the quantity of plastics used to virtually zero. In addition, Waste Negative is defined as a situation where Kao is involved in more plastic recycling than the amount of plastic packaging used by Kao. To achieve these goals, we are undertaking 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 promoting Innovation in Reduction and Innovation in Recycling from the perspective of 4R in order to reduce the use of plastic packaging, which has become a serious issue for society these days.

## Efforts in development, manufacturing and sales

We have set reduction targets for how much waste we generate, and we aim to minimize the amount of waste generated at each stage of development, production and sales in our entire group.

We are reusing and recycling waste and other materials inside and outside the company.

# Zero Waste GRI 306-1, 306-2

We ensure that generated waste is thoroughly sorted, and we select the most appropriate recycling methods in cooperation with contracted waste treatment providers. At the same time, 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.

**Development / Production**
We are studying loss reduction countermeasures on an ongoing basis according to the type of loss of raw materials and products that occur in our plants in order to minimize the losses.

**Sales**
Going forward, we will review product shipping and stock replenishment methods and provide information using digital means in an effort to minimize waste generated in returned products and promotional materials.

**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 the 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 store and treat waste containing PCB appropriately in accordance with the law until its disposal is contracted to a service provider.

**Reducing food waste**
We monitor the generated food waste that is treated through wastewater treatment or incineration and cannot be effectively used for other purposes.

Since food waste is generated when products close to their use-by dates are returned, we work with our suppliers to extend use-by dates and review return policies. Some returned products can be utilized effectively in methane fermentation and composting. Through activities such as these, we take steps to reduce food waste.

## Strategy

### Risks and opportunities

#### Risks

| Item | Content |
|---|---|
| **Policies, laws and regulations** | Stricter regulations on the processing of waste generated at worksites<br>Mandatory labeling of information on plastic consumption, etc. |
| | Increased regulation on the consumption of plastic packaging (mandatory use of recycled plastic, taxation) |
| **Technology** | Unsuccessful attempts to develop technology for reducing plastic consumption or using recycled plastic |
| | Increased volumes of waste generated from worksites in conjunction with the manufacture of new products |
| **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

| Item | Content |
|---|---|
| **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 |

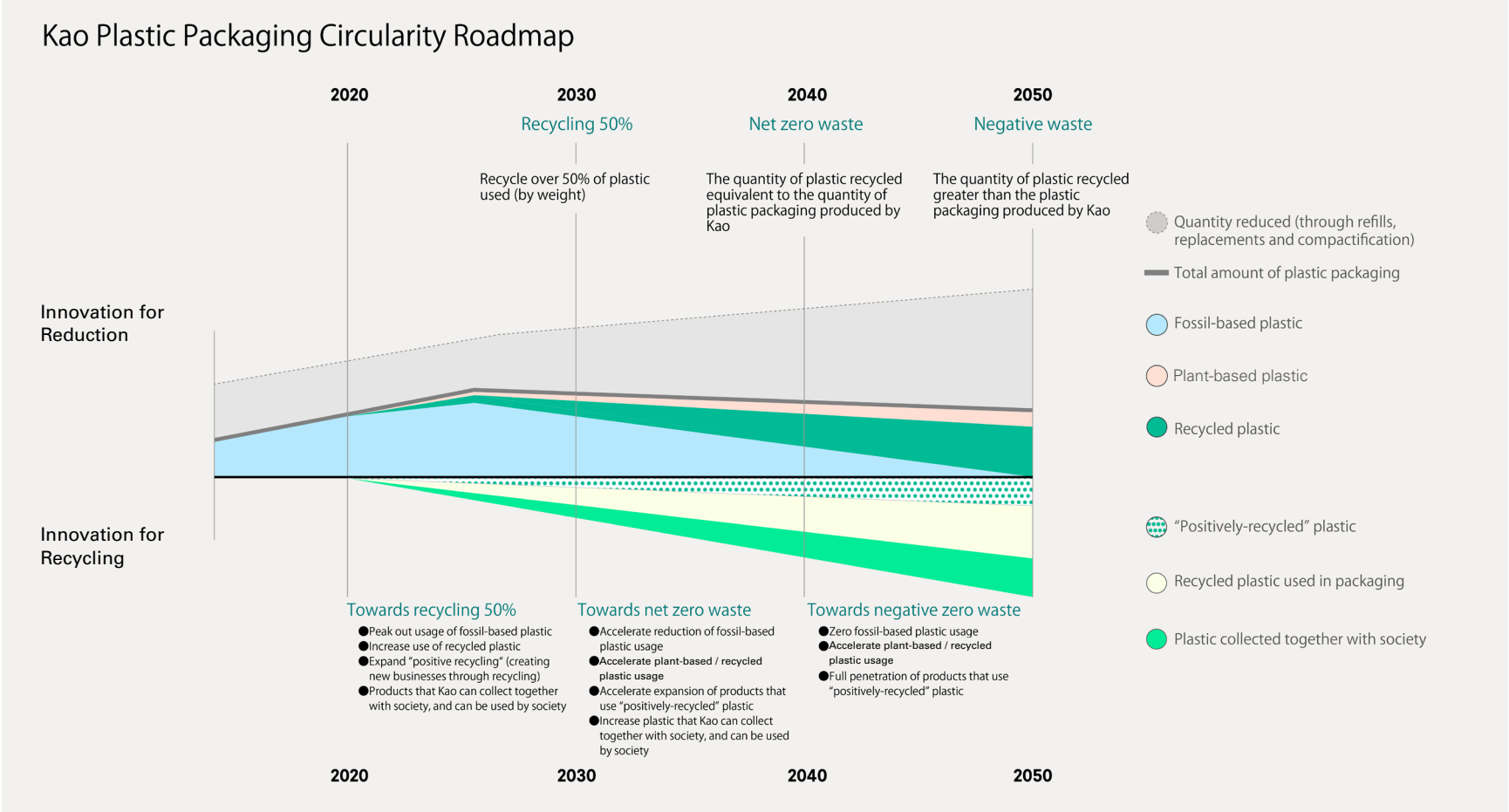
# Zero Waste GRI 306-1, 306-2

## Strategy

Plastic packaging plays an important role in our products because of its versatility and flexibility. At the same time, recognizing that the excessive use of plastic is a common concern for Kao and consumers in terms of its impact on the global environment, we believe that plastic resources used for packaging should be recycled as much as possible to create a recycling society.

We have established a roadmap for plastic packaging and aim to achieve Zero Waste by 2040 and Waste Negative by 2050. In order to achieve this, we are promoting our efforts in line with Innovation in Reduction and Innovation in Recycling.

**Roadmap toward the realization of Zero Waste (plastic packaging) by 2040 and Waste Negative by 2050**



# Zero Waste GRI 306-1, 306-2

**Innovation in Reduction**
This involves initiatives to reduce the amount of plastic used in packaging.

**Reduce**
This involves initiatives to reduce the quantity of plastics used in packaging. In addition to reducing the quantity of plastic used, we will reduce the use of fossil-based plastics while aiming to achieve a carbon-neutral society by 2050.

**Reuse**
The usage of plastic film refill packaging enables us to slash the usage of plastic by around 75% compared to plastic bottles, so we are promoting the adoption of refillable and replaceable products. To expand the use of such products, we have continued to make improvements to these refill products to make refilling easier for consumers, and we are promoting the use of innovative film packaging. We are also exploring the possibility of in-store refilling whereby consumers bring packaging to the store and purchase only the refill. In addition, we have adopted a system for some products whereby we take back used pieces of packaging from customers and then clean and reuse them.

**Replace**
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. We are implementing initiatives to replace fossil-based plastics with alternative materials such as paper and metal. We are also proceeding with initiatives to use plant-based plastics as an alternative to fossil-based plastics.

**Innovation in Recycling**
This involves projects to recover used packaging and recycle it so that it can be used again as recycled plastic.

**Recycle**
Based on the fundamental technology that we have accumulated until now, we are focused on creating innovative recycling technologies for used plastic, including the use of recycled plastic for packaging, as well as developing and using high-quality, low-cost recycled plastics, encouraging activities that generate value from used plastic, using plastic waste for industrial applications, and developing easily-recyclable packaging by, for example, replacing refill packs made from multiple layers of different plastic materials with a single material.

Furthermore, we are establishing a framework to recover and recycle used packaging in collaboration with stakeholders such as distributors, competitors and local government authorities, with the aim of helping to build a resource-circulating society. At the same time, we are working actively to promote the use of recycled plastic.

## Social impact

We are continuously implementing 3R activities (reducing, reusing and recycling waste generated at plants) not only at the stage for developing products and packaging, but also at the stage of production and transportation.

By adjusting the volume and frequency of raw materials deliveries with external suppliers, we contribute to reducing the amount of packaging materials our suppliers procure, as well as reducing $CO_2$ emissions from the transport of raw materials. In addition, we are continuing our efforts to improve the production methods used by our subcontractors for contracted product manufacturing, for example, by providing them with the relevant technology. This contributes to reducing $CO_2$ emissions associated with raw materials procurement.

In the area of plastic packaging in particular, we are promoting the development and sales of film packaging that can reduce plastic consumption by around 75% compared to regular containers. In Japan, products in refillable film packaging are becoming popular. Going forward, we will be able to reduce the quantity of plastics used in packaging in our group companies outside Japan by expanding this technology.

Besides our efforts in regard to film packaging, we are also implementing initiatives to reduce plastic consumption through the reuse of bottles.

Through effective collaboration between the recycler and the manufacturer, we are getting used products recycled to create recycled products that are useful in consumers' daily lives. Working together with distributors, competitors, local government authorities and other stakeholders, we are putting in place a framework for the collection of used packaging. Having as many other stakeholders as possible participate in this initiative will help make the benefits 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 ecological systems.

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 quantity of

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plastics used (to around one-sixth of the former level) is widespread both internally and externally, we will contribute to enhancing resource productivity throughout society as a whole. Doing this will contribute to creating and promoting a circular society and make it possible to offer consumers clean products in a future society with limited resource availability. These are important approaches for achieving the Kirei Lifestyle.

## Contributions to the SDGs


## Business impact

We are quite sure that the promotion of activities based on the strategies mentioned above will have various business impacts. Details of the business impacts are described as follows.

**Increasing the loyalty**
Stakeholders will be aware of our initiatives for the transition to a recycling society that reduces and recycles waste, not just plastics, and will share our values, which will lead to product selection and contribute to increased sales.

**Improving the productivity efficiency**
Curtailing the amount of waste and the like generated from business activities will lead to a reduction in manufacturing costs.

**Reducing waste processing costs**
Promoting recycling at each stage, from production to sales, will lead to a reduction in waste processing costs.

**Reducing the quantity of plastic used for packaging**
Once stakeholders recognize our efforts through our products, services and communication and understand their value, it will lead to an increase in loyalty and sales.

**Avoiding new taxes**
Although we may experience a cost increase from a short-term perspective, we can avoid new taxes on the use of fossil-based plastics from a mid- and long-term perspective.

# Governance

## Framework

Under the supervision of the Board of Directors, risk management in relation to zero waste issues is carried out by the Internal Control Committee and opportunity management is carried out by the ESG Managing Committee. These committees are both headed by the President & CEO.

Risk management related to zero waste issues is carried out by the Internal Control Committee (which meets twice a year) and its subordinate body, the Risk & Crisis Management Committee (which meets four times a year). These committees are headed by the Executive Officer Responsible for Corporate Strategy.

The ESG Managing Committee (which meets six times a year) is responsible for managing opportunities related to zero waste issues. Comprising outside experts, the ESG External Advisory Board provides advice and suggestions on issues raised by the ESG Managing Committee and offers outside viewpoints to be reflected into management, and the ESG Promotion Meeting executes the strategies.

In addition, the Plastic Packaging Steering Committee has also undertaken strategy formulation and implementation planning under board-level ownership, working to ensure reliable and rapid execution.

As part of our Responsible Care (RC) activities that include reducing waste produced by subsidiaries, RC managers in Japan and RC managers of subsidiaries with manufacturing plants outside Japan hold an annual meeting with the aim of activating and raising the level of the activities.

The RC Environment Committee of the SCM Division meets twice annually to gain an understanding of the 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. The Core Technology Committee for Environment and Energy-Saving conducts annual Environment Committee audits at every production site in its efforts to improve waste performance.

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.

## 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

# Zero Waste GRI 301-2, 306-2

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. We have created an e-learning program containing the knowledge needed to implement the Kirei Lifestyle Plan in both English and Japanese, and we deliver zero-waste-themed content to employees both within and outside Japan. In addition to waste-material reduction activities conducted in plants and technology development that is oriented toward using fewer resources in manufacturing, if we also strengthen employees' waste awareness, it will help to enhance our activities in this area. To this end, we hold various meetings, such as Global RC Meetings whereby RC managers in Japan and RC managers of subsidiaries with manufacturing plants outside Japan meet together, and packaging review meetings whereby staff in the R&D, SCM Division and business units meet together, with the aim of spreading internal awareness of zero waste. With regard to packaging, our Research Laboratories, Procurement, SCM, Business divisions, the ESG Division, etc., engage in a periodic exchange of views regarding our strategy in this area, the issues faced, and how to address them.

## Collaboration with stakeholders

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

As the waste generated at the stage of production impacts local communities, having good communication with them 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. To recycle more waste and make it easier to process waste, we are implementing initiatives in collaboration with municipalities, retailers, recyclers, and commodity manufacturers.

We are also sharing ideas with suppliers and undertaking collaborative R&D with them in order to reduce the quantity of plastics used in packaging and enhance its recyclability.

Consumer behavior also needs to change in order to attain the Kirei Lifestyle. We provide opportunities to think about the Kirei Lifestyle through visits to the Kao Eco-Lab Museum and plant tours that take Kao products as the theme. This visit program to the Kao Eco-Lab Museum includes displays that enable participants to get a real feel for the amount of waste generated from products manufactured using limited amounts of resources.

## Risk management

In the process of assessing risks and opportunities, the ESG Divisions identify risks anticipated at Kao, and conduct risk and opportunity assessments based on feedback from outside experts and staff in internal departments. These are approved by the Internal Control Committee and ESG Managing Committee, respectively.

The secretariat of the Risk & Crisis Management Committee (Risk Management & Responsible Care) conducts comprehensive and topical risk surveys on each division and subsidiary to identify key risks and review measures. In principle, the division and department in charge take the lead in addressing these risks, but cross-organizational and common risks are addressed in collaboration with related divisions to strengthen the response and are treated as corporate risk issues as appropriate.

P297 Risk and Crisis Management > Governance > Education and promotion > Risk surveys

# Metrics and targets

## Mid- to long-term targets and 2023 results

We are aiming to achieve net zero waste for plastic packaging by 2040 and negative waste for plastic packaging by 2050, and we will also be helping society as a whole to reduce the use of plastic packaging. Furthermore, we will promote the reduction of waste, not only plastic.

### 2025 mid-term targets

| Item | Scope | Target for 2025 |
|---|---|---|
| **% of recycled plastic used in PET containers** | Kao Group in Japan (consumer products) | 100% |

### 2030 long-term targets

| Item | Scope | Target for 2030 |
|---|---|---|
| **Quantity of fossil-based plastics** | Kao Group | Will peak and begin to decline |
| **Quantity of innovative film-based packaging penetration** | Kao Group and other companies | 300 million[*1] |
| **Recycling rate of plastics involving Kao** | Kao Group | 50% |
| **Amount of waste generated[*2]** | Kao Group Production sites[*3] | 0 (less than 1%) |
| **% reduction of discarded products and discarded promotional materials** | Kao Group in Japan | 95% |

# Zero Waste GRI 301-2, 306-2, 306-3, 306-4

We aim for Kao's involvement in plastic recycling to account for at least 50% of the volume of plastic packaging used.

We are aiming to reduce the amount of plastic packaging[*4] used by Kao and by society as a whole by 200 thousand tons.

We are also aiming to use recycled materials for 40% of the plastic packaging used by Kao and to peak out the use of fossil-based plastics.

*1 Annual penetration amount
*2 Amount of waste not recycled from business sites
*3 Beginning with production sites
*4 Amount reduced through the use of innovative film packaging, refill and replacement products, and the development of more concentrated products

### 2040 long-term targets

We are aiming to reduce plastic packaging waste to zero[*5].

*5 This is the state in which the amount of plastic packaging used by Kao is roughly equivalent to the amount of plastic for which resource recovery[*6] is implemented by Kao.
*6 Amount of positive recycling of plastic + Amount of recycled plastic that is used by Kao for containers and packaging + Amount of plastic that is collected by Kao and society in general and used by society.

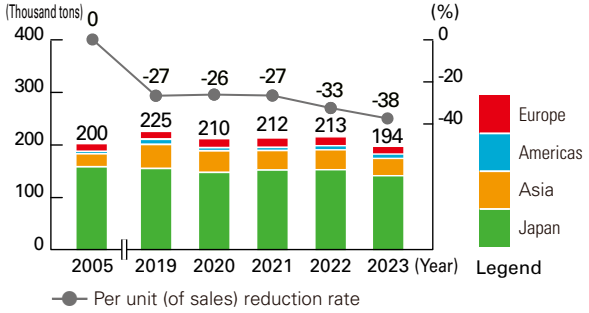
### 2050 long-term targets

We are aiming to reduce the quantity of fossil-based plastics used to zero.

We are also aiming to achieve negative plastic packaging waste[*7].

*7 This is the state in which the amount of plastic for which Kao implements resource recovery[*6] is more than the amount of plastic packaging used by Kao.

### 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 the 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 FY2017 onwards.

### Amount of generated waste and other unwanted materials

In 2023, the amount of waste generated totaled 194 thousand tons, representing a decrease of 19 thousand tons compared to the previous year. Although net sales decreased slightly, the reduction rate (per unit of sales) was 38%, representing a significant improvement.

### Amount of hazardous waste generated

Of the generated waste, 22 thousand tons constituted hazardous waste. No hazardous waste was transported internationally under the Basel Convention.

### Waste plastics

In 2023, the volume of waste plastics discharged in Japan (including in-house treatment, excluding valuable resources) was 6,728 tons, lower than the previous year's result (7,340 tons). Kao Corporation was the only corporate unit to discharge more than 250 tons, with 6,176 tons of waste plastic discharged, which was less than the previous year's result (6,770 tons). We will continue our initiatives to reduce the amount of waste by aiming to keep it below the previous year's level.

### Recycling

We are promoting the reuse of waste, such as offcuts generated in the production of baby diapers, etc., for example, by turning such waste into pallets or using it to make paper products.

Reuse and recycling[*8] of waste, etc. was 176 thousand tons ☑ with a recycling rate of 91%.

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 18th consecutive year since the target was set (final disposal ratio to generated waste for all Kao Group offices in Japan).

Starting from 2021, as a new zero waste indicator, we have begun to calculate a combined landfill disposal and incineration rate, which was 4.3% for all production sites combined in 2023. We are aiming to reduce this rate to under 1% (i.e., to more or less zero) by 2030.

The combined landfill disposal and incineration rate is the share of industrial waste (as defined in Japan) generated by production sites that is disposed of either by landfill disposal (direct disposal by landfill without intermediate processing) or incineration (incineration without heat recovery). Waste that individual countries' laws require to be disposed of by landfill or incineration and waste in countries where there are no facilities for disposal other than by landfill or incineration is excluded.

*8 Boundary: All Kao Group sites, including company cars in Japan
* Assurance provided for the amount of material recycled

# Zero Waste GRI 301-2, 306-2, 306-3, 306-4

**Reduction rate of discarded products and discarded promotional materials**
The target for this activity was set in 2021. The performance achieved in 2023 was a 20% reduction rate (20% in 2022, 14% in 2021).

**Food waste**
We define food products returned from business partners because of damage to packaging or because they are past the best-before dates as food waste, and we manage food waste through programs to measure break-down by food category. Of the food waste we have received, we define products processed into feed or for composting that have been processed or disposed of based on the amount of food waste utilized effectively, wastewater treatment, or incineration as in-house disposal. In 2023, the amount of food waste disposed of by the Kao Group as a whole totaled 711 tons, of which 1 ton was utilized effectively for methane fermentation or composting*1. To reduce the amount of food waste disposed of internally, we are promoting the development of products with a long use-by date and trying to minimize delays in distribution. We have also been working together with our business partners to review the rules relating to the return of products that are approaching their use-by date.

*1 Besides methane fermentation or composting, this figure also includes the effective utilization of packaging (such as cans or cartons).

**Changes in amount of food waste ☑ (in tons)*2**

| Item | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| Amount of food waste generated | 251 | 592 | 723 | 706 | 714 |
| Amount of food waste utilized effectively*3 | 20 | 27 | 43 | 8 | 1 |
| In-house disposal | 230 | 565 | 680 | 698 | 712 |

*2 Third-party assurance was obtained for these data from 2021 onwards. Boundary: Kao's food businesses
*3 Contracted disposal: Contracted disposal includes methane fermentation or composting, and also effective utilization of packaging (such as cans or cartons)

**Inspection of waste treatment facilities**
In 2023, the number of locally confirmed cases increased due in part to the transition of COVID-19 to category 5. We have confirmed 173 facilities with the cooperation of 135 waste treatment companies, including a documentary review (in Japan). The evaluation results showed that there were no waste treatment companies that did not meet Kao's evaluation criteria.

**Amount of packaging materials used by material type**
In 2023, the amount of paper and pulp used was 174 thousand tons. Of this, the ratio of certified paper and pulp was 97%. The amount of metal used in packaging was 4.5 thousand tons, and the amount of glass used was 0.6 thousand tons.

**Horizontal material recycling of film packaging**
Since June 2021, we have been developing and verifying recycling technology at our pilot plant for film packaging recycling set up at Wakayama Research Laboratories. Since October 1, 2021, we have also been participating in the project of Kobe Plastic Next: Joining Forces to Recycle Refill Packs. In this project, retailers, consumer product manufacturers, and recyclers (resource recycling business operators) collaborate with the city of Kobe to recycle used refill packs of household and personal care items, with the aim of becoming a resource-circulating society. In 2023, we collected used refill packs and used them partially to produce recyclable refill packs for the first time, in collaboration with Lion Corporation. The products we sold this time were available in limited quantities, but we will continue our R&D so that we can continue to provide the refill packs as products.

We are examining easier-to-recycle packaging designs with the aim of raising recycling rates and realizing horizontal material recycling.

**Shift to 100% recyclable, reusable packaging**
Plastic packaging used for household products in Japan is required by Containers and Packaging Recycling Law to have a framework in place for recycling. Our 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.

* Cardboard, paper, plastic, metal and glass

**Amount of plastic packaging used**
Plastic packaging usage in 2023 was 85 thousand tons. Of this, fossil-based plastic usage amounted to 79 thousand tons.

Kao Corporation now offers 423 refill and replacement products (as of December 2023), with a penetration rate of 79% and approximately 80%. The refill ratio for fabric softener, in particular, now stands at approximately 90% (unit basis).

Plastic consumption has been reduced by 78.3% 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 128.6 thousand tons, and the reduction rate (compared to if the products had been packaged in the original plastic packaging) was 78.4%.

# Zero Waste GRI 301-2, 306-2

**Changes in amount of plastic packaging used (in thousands of tons)**

| Item | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|
| Amount of plastic packaging used | 116.6 | 92.9 | 90.8 | 85.0 |
| Recycled plastic usage rate | 0.37% | 1.5% | 2.9% | 6.1% |

### Quantity of innovative film packaging penetration

In 2023, the total number of products manufactured using innovative film packaging, calculated as the combined total of products that included *Raku-raku Eco Pack Refill* and *Air-in Film Bottle*, was approximately 14 million items.

### Quantity 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 EMEA and by the *Oribe* brand in the U.S., as well as by brands such as *Attack ZERO* and *CuCute* in Japan. The total amount of recycled plastic used in 2023 was 5,152 tons (2.0 times as much as in 2022).

### Recycled plastic usage rate in PET packaging

In an initiative targeting household products sold in Japan, we have begun using recycled plastic in the manufacturing of PET packaging, starting with the packaging of *Attack ZERO* and *CuCute Clear Foam Spray*. In 2023, 81% of the plastic used in this PET packaging was recycled plastic.

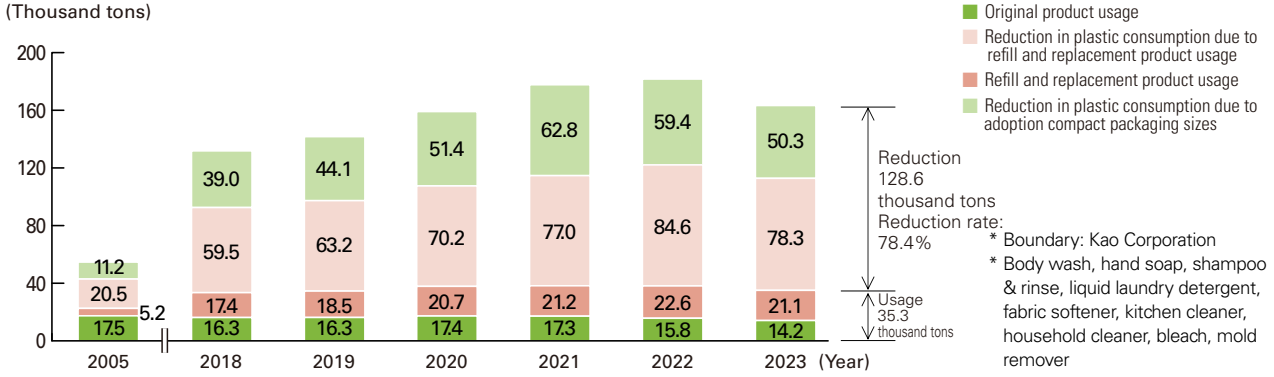
### Contribution to the reduction of the amount of plastic used in packaging by Kao and society

The amount contributed to the reduction of plastics for refills/replacements was 128.6 thousand tons.

### Quantity of plant-based plastics used

Plant-based plastics are used for *Merit* shampoo and conditioner, *Segreta* shampoo and conditioner, *CuCute* 1,380 ml containers, *Raku-raku Eco Pack Refill, and and* shampoo and treatment, and other products, and the total amount used has reached 418 tons (0.9 times the amount in 2021).

**Usage and reduction volume of plastic in refill and replacement categories**



# Zero Waste GRI 301-2, 301-3

## Main initiatives

### Initiatives 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 the product function compared to its 1990 version.

**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 laundry 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 5000/5500 asphalt modifier**

The Chemical Business has used our proprietary modification and compounding techniques on discarded PET materials (waste PET) to develop *NEWTLAC 5000/5500*, a new type of asphalt modifier, through positive recycling. The full-scale commercial launch of the new product took place in late 2020. We are expanding the sales not only in Japan but also in North America and the Asian region.

Besides improving the durability of road surfaces in the same way as conventional asphalt modifiers, asphalt road surfaces that are durable and environmentally conscious can also be created because *NEWTLAC 5000* uses waste PET, the disposal of which has become a problem for society (approximately 1,430 PET bottles are used to cover a road area of 100 $m^2$).

For our contribution to the reduction of environmental impacts and implementation of our technology into society, Kao received the Minister of the Environment Award in the 22nd Green and Sustainable Chemistry Award in May 2023.

Web The winner of the Minister of the Environment Award in the 22nd Green and Sustainable Chemistry Award
Development of Highly Durable Asphalt Materials for Pavement Using Waste PET
https://www.kao.com/jp/newsroom/news/release/2023/20230525-002/

**Recycling of used baby diapers**

Field testing of technology to convert used disposable baby 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 removing 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 has been undertaken through joint research with the Kyoto University Open Innovation Institute, with the aim of realizing social implementation by 2025.

**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.

### 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.

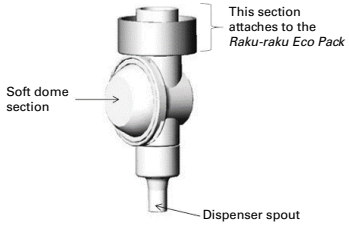
Until now, these were sold only on our online site, but we implemented a full-scale rollout to stores in April 2020. We believe this will make them accessible to more consumers and will encourage use.


*Smart Holder* and *Raku-raku Eco Pack Refill*

# Zero Waste

## 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 Refill*, 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 quantity 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*

P80 Sustainable Lifestyle Promotion > *Yoki-Monozukuri* in plan and action and proposing activities and collaboration with stakeholders

## Launch of new refill containers eco-peko bottles for the future

*eco-peko* bottles for the future, which have been used for *CuCute* products launched in September 2023 incorporate Kao's packaging and container technologies (patent pending) to realize extremely thin bottle walls for easy crushing at disposal, while retaining durability and ease of refilling. As a result, not only does the product ease the overall burden of washing dishes, but also the quantity of plastics used has been reduced by approximately 40%*1, and $CO_2$ emissions from container production and disposal have also been reduced.

*1 Weight ratio regarding conventional containers

*eco-peko* bottle

P87 Purpose Driven Brands > CuCute: Brand activities that are eco-friendly and reflect diversifying lifestyles

## Spread of thin-film refill packaging

Film refill packaging already uses less plastic than regular containers. To promote the use of refill containers, Guhl of Germany launched its *refill shampoos* in 2023, and Jergens launched its *Stampers Foam Hand Wash* in the Americas.



## Use of plant-based plastics

We are actively developing technologies for using plant-based plastics for bottles and refills. Since we began this initiative in 2012, our consumption of plant-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% plant-based plastic based on its weight. In Thailand, we replaced the container for *Bioré* makeup remover with plant-based bio-PET and put refill packs made of recyclable single material on the market in May 2023.


## 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 2020 (specifically, in-store refill for handwashing products), starting from 2021, reusable bottles and *Aroma Reed Diffuser refills* have been on sale both in-store and online in EMEA and in the Americas. Utilizing refills makes it possible to reduce the amount of single-use plastic and plastic that is disposed of as waste by 82%.

# Zero Waste GRI 301-2, 301-3

*Aroma Reed Diffuser refill*

## Initiatives to recycle

### RecyCreation activities

We have been engaged in research toward creating a new circular economy system. We have proposed and are working on the RecyCreation approach, which generates new value by adding technology and the knowledge and ideas of various people to used items. In our RecyCreation activities, we continue to collect in cooperation with local governments and NPOs such as Kitami City, Onagawa Town, Ishinomaki City, Kamakura City, and Kamikatsu Town, in-store collection in cooperation with companies such as Lion Corporation, Ito-Yokado, Welcia Yakkyoku, and Hamakyorex Co., Ltd., and collection from employees within Kao Corporation. Adding the amount collected by Kobe Plastic Next, which has been participating in these efforts since 2021, the total amount of refill packs collected from January to December 2023 is approximately 10 tons.

Web RecyCreation on Facebook
https://www.facebook.com/RecyCreation.jp/

**The RecyCreation Concept**


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

Since October 2021, we have been participating in the project of Kobe Plastic Next: Joining Forces to Recycle Refill Packs. In this project, retailers, consumer products manufacturers, and recyclers (resource recycling business operators) collaborate with the city of Kobe to recycle used refill packs of household and personal care items, with the aim of becoming a circular economy society.

The city of Kobe encourages every resident of Kobe to recycle used refill packs from detergents and shampoo products, etc. by dropping them off in collection boxes placed in 75 locations at retail outlets throughout the city. By leveraging "return trip operations" from retail outlets and the cooperation of existing waste collection operators, used refill packs can be collected effectively with minimum environmental impact. Recyclers and manufacturers are working together to achieve horizontal material recycling for film packaging from the collected refill packs, as well as turn them into recycled products that are useful in daily life. Kobe and 16 companies and organizations are collaborating to realize resource circulation. The project aims to set an example to help promote similar activities across Japan.

*1 Recycling of materials into products with the same application

KOBE PLASTIC NEXT みんなでつなげよう。つめかえパック リサイクル

### Efforts to recycle marine plastic waste

It is said that approximately 65% of waste (number of containers / bottles base) drifting to Japan is plastics, so we are working not only on the reduction of plastics but also on the effective use of marine plastic waste released into the ocean.

On the Tomogashima islands of Wakayama City, waste and debris that drift to the islands have been a serious issue for some time. In collaboration with Wakayama City, we have been developing products made from reused marine plastic wastes that have been collected on Tomogashima islands with our unique technologies. In December 2023, we constructed pavement using an asphalt modifier made from waste PET in the area of the Wakayama Station bus terminal.

### Use of recycled materials

In 2023, 6% of packaging was created using recycled plastic. Regarding bottles made from PET materials in Japan, the incorporation of recycled plastic advanced in 2023 with the dishwashing detergent *CuCute*'s bottle-type refill container (extra-large size), and the odor removal product for clothes and fabrics *Resesh Disinfectant EX WIDE JET*.

# Zero Waste GRI 301-2, 301-3

Kao (Taiwan) started using recycled plastic for regular containers in 2016. In 2023, the use of recycled plastics increased approximately 15 times compared to 2016. The use of recycled plastics has also started in China and Thailand, such as the *Bioré Cleansing Oil* and *Feather Nature Clean Care*'s 340 mL and 480 mL bottles.


*Molton Brown* has also started using recycled plastics. Some products in their hotel series use polyethylene containing PCR material.

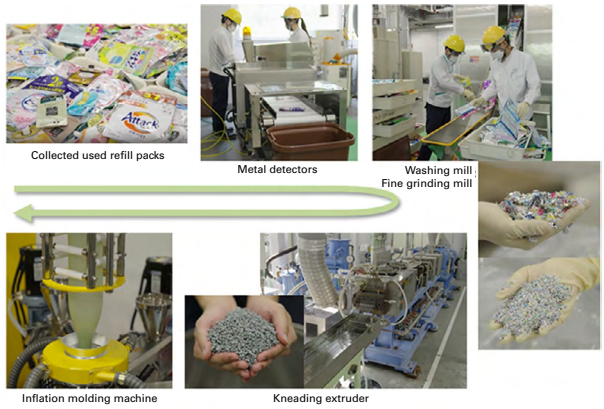

**Development of film packaging recycling technology**

Refill packs can significantly reduce the quantity of plastic used compared to rigid containers and are made from composite materials with many layers rather than a single raw material, as with PET bottles, in order to protect its contents from heat, moisture and UV rays with a thin film. In doing so, the different varieties of recycled ingredients make inhomogeneous plastic, which is difficult to reuse in film packaging under present circumstances.

We aim to improve the rate of recycling and achieve horizontal material recycling by developing and verifying recycling technology at our pilot plant for film packaging recycling set up at Wakayama Research Laboratories in June 2021. The plant will examine effective processes for separation and collection from consumers and easier-to-recycle packaging designs.

In collaboration with Lion Corporation, we have commercialized refill packs that use a portion of horizontal-recycled regenerated materials for liquid detergent refill containers, which are available in limited quantities at select stores*1.

*1 Kao and Lion products at certain Ito-Yokado stores and Welcia Yakkyoku stores; Kao products only at certain AEON stores.




## 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.

**Enhancing waste recycling**

**Waste recycling in manufacturing**

One example of this is recycling the waste generated by the manufacture of diaper and feminine care 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. This project has now been put on hold, as the required number of plastic pallets had already been secured.

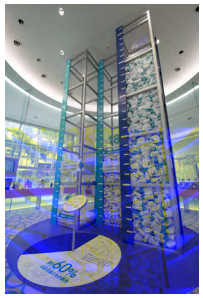
# Zero Waste GRI 2-28, 308-2

## 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 our 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 that are 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 waste problem. The Executive Advisor at Kao Corporation is chairman of the alliance, and Kao is taking a leading role among Japanese businesses.

Web Clean Ocean Material Alliance
https://cloma.net/english/

**Japan Partnership for Circular Economy (J4CE)**

The trend toward development of the circular economy is picking up speed throughout the world, and we are participating in the Japan Partnership for Circular Economy, which was established to strengthen collaboration between government and the private sector, with the aim of promoting an enhanced understanding of the circular economy among a wide range of stakeholders, including Japanese companies, and of promoting related initiatives. We provided case studies for inclusion in a collection of case studies, and our representatives were included in the panelists for a panel discussion held to accompany the official ceremony that marked the publication of the collection of case studies and the launching of the related website.

Web Japan Partnership for Circular Economy (J4CE)
https://j4ce.env.go.jp/en

**Circular Partners (CPs)**

A cooperative organization that is composed of members of countries, local governments, colleges, companies, trade associations, and relevant organizations and that engages in circular economy activities in an enterprising and pioneering manner. Members of CPs discuss and examine what action to take to realize a circular economy.

**Package collection measures**

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

In October 2020, we signed a cooperation agreement with Wakayama City. To protect the ocean from pollution, including marine plastic waste, arising from land-based activities, we have undertaken surveys and collection of marine plastic waste that has accumulated at Tomogashima, Kataonami and Hamanomiya Beach. We are promoting research on reusing recovered marine plastic to make tables and chairs for oceanside facilities, and using it as a road strengthening agent on the oceanside cycling path. We are 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 aim of spreading our knowledge about past successful cases of improving communication with waste treatment companies, and

# Zero Waste

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 2023.

## Employees' opinions

### Effort to collect used plastic packaging

**Shinobu Hiramatsu**

Packaging Technology Research, R&D, Kao Corporation

Two major environmental challenges that Kao has been focusing on are decarbonization and zero waste. As a member of Packaging Technology Research, I have been collaborating with local governments and companies to establish a scheme to collect used plastic packaging and to promote the development of a technology for reusing it. Through this effort, I am acutely aware of the importance of individuals' and companies' awareness of recycling. I also believe that, aside from the establishment of a recycling technology, the construction of a recycling system is indispensable, and that it is impossible to achieve this goal only through Kao's efforts alone. Therefore, by collaborating with various stakeholders, I will continue to promote recycling in the entire society and industry, focus on the development of new environment-friendly containers, and aim to create a resource-circulating society.

# Zero Waste

## Stakeholder engagement

**Masanobu Ishikawa**
Specially Appointed Professor / Assistant to the President
Eikei University of Hiroshima

**Kao's response to the views expressed last year**

Kao has been actively promoting activities for collecting and recycling plastic containers and collaborating with various groups all over the country. We collected used refill packs and used them partially to produce recyclable refill packs for the first time, in collaboration with Lion Corporation. The products we sold this time were available in limited quantities, but we will continue our R&D so that we can continue to provide the refill packs as products.

The next step of this initiative is to ensure economic sustainability. To do that, a greater amount of plastic needs to be collected, and the cost of collecting, filtering, and storing the plastic needs to be reduced. We will address the challenges common to RecyCreation activities and other similar activities, and will seek solutions that provide significant value to the entire society.

Moreover, the asphalt modifier produced from collected PET bottles contributes to resolving environmental issues and reducing infrastructure maintenance costs, which helps us to create new value based on interface science—Kao's core competence. We will continue to aim to grow further as a leading company in initiatives for resource circulation.

Kao's activities are steadily advancing in FY2023. As the volume of collected materials increase, the collection and recycling activities of plastic containers in collaboration with various entities throughout Japan has been seeing an accumulation of experience regarding the deepening of cooperation, recycling, logistics, sorting technologies, and cost structures to pave a clearer path towards goals.

As a result of these activities, Kao has become the second organization to be approved (the first as a manufacturer) for the voluntary collection of plastic packaging under the Plastic Resource Circulation Act. As the first manufacturer approved under this system, both supervisory authorities and Kao invested significant amounts of time to obtain approval. However, as a result, we have been able to collect plastic packaging from Kao offices throughout Japan and obtain certification for the system in Kamakura that collaborates with the local government there. This process visualized the relationship between the cost structure of the real system to attain the goals under the Plastic Resource Circulation Act and the constraints of the existing legal system. This is important knowledge for Japan towards the shift of its future economic structure to a circular economy structure, and the organized dissemination of information for future discussions is required.

In addition to the (limited) sales of horizontal material products from the business for collecting refill pouches and horizontal material recycling, the main product bottle collection business has been conducting trials involving picking out target bottles on a sorting line after separate collection at the municipality to confirm the feasibility of the technology.

The production of asphalt modifiers using PET bottles that are unsuitable for recycling as they are excessively soiled or the like being conducted, and the development and sales of products that quintuples the life of road paving through this is considered to be a great contribution on a global scale. In developing countries, there is a significant demand for road paving and obtaining high-quality recovered materials is difficult, making this initiative highly suitable.

The horizontal recycling of composite films and asphalt modifiers are both based on interface science—Kao's core competence. Kao shows that an arterial industry can create new value by focusing its core competence on resource recycling. I look forward to Kao shining brighter as a leading company that contributes to sustainability in its core business.