

Decarbonization GRI 201-2

As we work toward the goal of becoming carbon zero (reducing CO₂ emissions to net zero) by 2040, and becoming carbon negative by 2050, besides aiming to reduce CO₂ emissions in our own business activities, we also aim to contribute toward realizing the decarbonized society by helping to reduce emissions in society as a whole, and through carbon fixation to reduce the amount of carbon dioxide in the atmosphere.

Social issues

Societal ideals and current issues

Today, the vision for society is to realize net zero emissions of greenhouse gases by 2050, so that the average rise in global temperature can be kept to within 1.5°C higher than pre-industrial revolution levels.

However, according to the Working Group I contribution to the Sixth Assessment Report published in 2021 by the Intergovernmental Panel on Climate Change (IPCC)*¹, it is highly likely that human activity has already caused average global temperatures to rise by around 1.1°C over the period between 1850–1900 and 2010–2019, and if the current situation continues, it is possible that this rise may increase to 1.5°C by as soon as 2030.

Global warming is thus already underway, and has been accompanied by an increase in the scale of damage caused by localized torrential rain and typhoons, frequent forest fires, the melting of the Siberian permafrost and other climatic abnormalities.

In response to this situation, in recent years, countries and regions around the world, including the European Union (EU), have been issuing carbon neutrality declarations, and in October 2020 Japan also announced that it would seek to become carbon neutral by 2050. In addition, many local governments within Japan have been declaring a climate emergency in relation to the crisis posed by climate change, and large numbers of business enterprises have announced that they are aiming to realize net zero emissions. In addition, COP27 was held in Egypt in November 2022 and made more effective action all the more important. There have also been movements demanding effective

action on climate change, such as Fridays For Future, in which young people—who represent the future—have played a key role.

*1 IPCC

Intergovernmental Panel on Climate Change Intergovernmental Panel on Climate Change

This organization was established by the United Nations Environment Programme and the World Meteorological Organization in 1988 for the purpose of conducting comprehensive evaluations from scientific, technical and socio-economic perspectives regarding climate change, its impact, adaptation and mitigation measures.

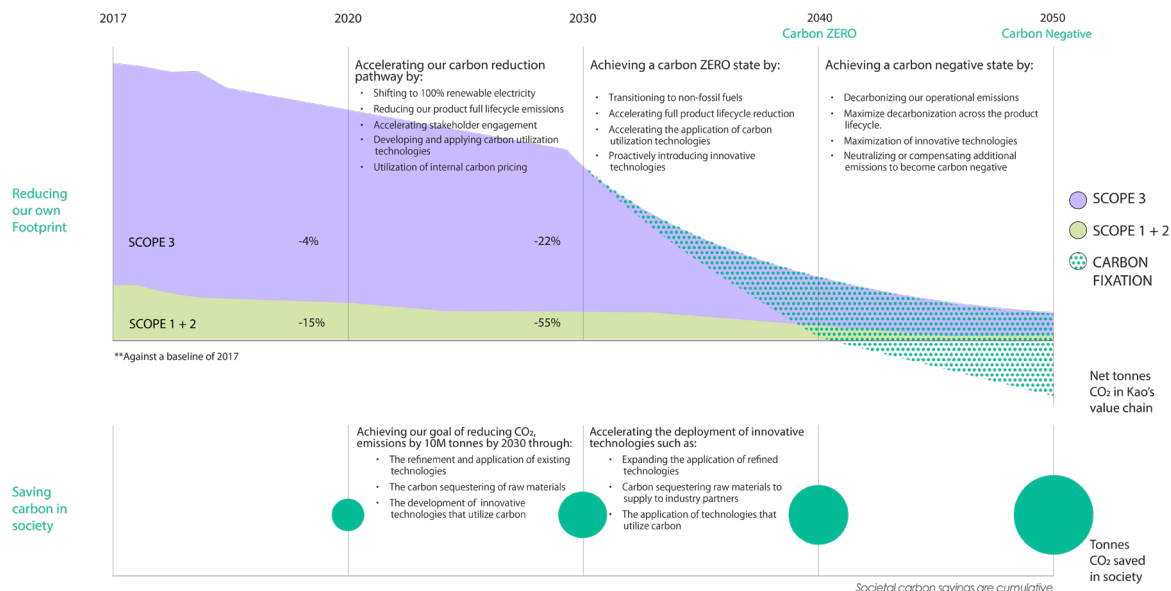
Kao's current status and assets

We are aiming to achieve carbon zero by 2040, earlier than the standard global target year of 2050. This is a very challenging target that cannot be achieved just through slow evolution of existing technologies and

activities. To achieve this target, we will need to fully utilize all of our existing assets (including production systems and equipment, intellectual property, human capital, internal and external networks and investments), and will need to build an organizational structure capable of speedy decision-making in relation to the promotion of decarbonization. Our R&D capability gives us the ability to undertake innovation based on Essential Research, and we will need to collaborate with external stakeholders in order to maximize this ability.

What is Kao aiming for?

We are moving speedily from the making of a decarbonization declaration to the implementation stage, and have formulated a roadmap for ensuring that we achieve carbon zero by 2040.



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Estimation of business impacts by 2030

We evaluated the business impacts in relation to What Kao Aims to Be by 2030 by four product groups. More specifically, we set baseline Profit and Loss (P&L) data for 2030 on the assumption that our company's sales would reach 2.5 trillion yen by 2030 (1.67 times as high as in 2018), and that P&L would grow proportionately compared to 2018. Business impacts were estimated on the basis of this baseline P&L. In order to compare

the respective impact of individual factors on our business based on different climate change scenarios, we performed evaluation for both the 1.5°C scenario^{*1} and 4°C scenario^{*2}. For this reason, evaluation was not performed for some factors even though there was the potential for them to have a significant impact. There were also some factors which might have a major impact by 2050, but which will have only a relatively small impact by 2030.

*1 1.5°C scenario

This is equivalent to the IEA's NZE 2050 Scenario, 2DS Scenario, IPCC's RCP 1.9 scenario or SSP1-1.9 scenario, etc. It refers to the economic measures that would be needed in order to keep the average global temperature rise down to less than 1.5°C compared to the situation prior to the Industrial Revolution, and to the environmental damage that is expected to result from such a rise in temperature.

*2 4°C scenario

This is equivalent to the IEA's Current Policy Scenario, IPCC's RCP 8.5 scenario or SSP5-8.5 scenario, etc. It refers to the economic measures that would be needed in order to keep the average global temperature rise down to less than 4°C compared to the situation prior to the Industrial Revolution, and to the environmental damage that is expected to result from such a rise in temperature.

Decarbonization scenario analysis

		Evaluation items	Evaluated financial impact	Impact of climate-related risks and opportunities, and financial planning, for 2030 (+ indicates a positive impact, - indicates a negative impact, ND indicates no impact, and numbers indicate the size of the impact)				Kao's response status
				1.5°C scenario*		4°C scenario		
Transitional	Policies, laws and regulations	Introduction and/or raising of carbon tax	Increased operating costs due to introduction and/or raising of carbon tax	Increased operating costs due to introduction of new taxes and/or raising of tax rates	---	New carbon taxes are not introduced, and tax rates are not raised	ND	Scope 1+2 emissions reduction targets are set, and emissions reduction activities continue
		Introduction of restrictions on plastics	Taxation of fossil-derived raw materials for packaging	Increased procurement costs due to introduction of new taxes	-	New taxes are not introduced	ND	Public announcement of an Innovation in Reduction implementation strategy Annual adoption targets are set for innovative film packaging, and activities to reduce plastics usage continue
			Increased costs due to use of recycled plastic becoming compulsory	Increased procurement costs due to a rise in the unit price of recycled plastic resulting from the use of recycled plastic becoming compulsory	-	The use of recycled plastic is not made compulsory	ND	Public announcement of an Innovation in Recycling implementation strategy Expanded adoption of packaging made from recycled plastic
	Markets	Rising energy prices	Volatile electricity retail price	Increased costs due to a rise in the electricity retail price	-	Reduced costs due to a fall in the electricity retail price	+	Setting of energy use reduction targets, and proactive installation of solar panels to generate electricity for own use
		Rising raw materials prices	Rising prices for fossil-derived raw materials	Increased procurement costs due to rising crude oil prices	--	Increased procurement costs due to rising crude oil prices	---	Continuing activities to reduce usage of fossil-derived raw materials in product groups that utilize such raw materials
			Rising prices for procurement of palm oil	Increased procurement costs due to supply shortages resulting from tighter restrictions on forest development	-	Unchanged costs due to increased supply resulting from the development of new plantations	ND	Promotion of the development of substitute raw materials (such as algae-derived fats and oils, and unused biomass), and commencement of use
			Rising prices for procurement of pulp	Costs remain unchanged because, although forests fires increase, there is no shortage of supply	ND	Costs remain unchanged because, although forests fires increase, there is no shortage of supply	ND	—
		Changes in consumers' behavior	Increased sales of ethical products	Sales increase because of increased demand for ethical products on the part of the generation that will be the main purchasers of Kao products in 2030	++	Sales increase because of increased demand for ethical products on the part of the generation that will be the main purchasers of Kao products in 2030	++	Inviting Ms. Rika Sueyoshi, CEO of the Ethical Association, to become a member of Kao's ESG External Advisory Board Development and provision of ethical products
Physical	Acute	Intensification of abnormal weather conditions	Increased damage from flooding	Increased risk of flooding, but difficulty in accurately predicting the amount of damage	-	Increased risk of flooding, but difficulty in accurately predicting the amount of damage	-	BCP adjustment Implementation of supplier water risk surveys
	Chronic	Rising average temperatures	Increased sales of sunscreen and antiperspirant products Increased sales of products against infectious diseases	Increased sales in regions and seasons with higher temperatures	+	Sales increase due to more expansion of regions and seasons with higher temperatures	+	Production planning adjustment Development and launch of products against infectious diseases
		Demand for water outstripping supply	Rising operating costs due to increased water use charges	Rising operating costs at plants operating in regions with water shortages	-	Rising operating costs at plants operating in regions with water shortages	-	Setting of water use reduction targets, and continued implementation of water use reduction activities

Note: Kao's assessment based on scenario analysis using the 2°C scenario

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Policies

Climate change poses a major risk to the realization of an enriched Kirei Lifestyle, both now and in the future. The Kao Way enunciates our mission to “create a Kirei life for all, providing care and enrichment for the life of all people and the planet,” and we are actively implementing initiatives to both mitigate and adapt to global warming in relation to every aspect of our business strategy.

Our Basic Principle and Basic Policies on Environment and Safety states that “We shall contribute to social sustainability by giving thorough consideration to environmental conservation and human safety in every aspect of our operations, including product development, materials procurement, manufacture, distribution, sales, usage and waste disposal.”

Furthermore, the Kao Group Responsible Care (RC) Policy contains the following declaration: “We shall strive to continue to reduce the environmental impact of our business operations by promoting reduction of uses of resources such as water and energy.”

We will also promote “eco together” activities in line with the Kao Environmental Statement, which 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 raw materials procurement and manufacturing, to distribution, sales, usage and final disposal, we want to engage in ‘eco together’ with stakeholders, including consumers, throughout the product lifecycle.”

By formulating our High-Risk Supply Chain Management and Sourcing in relation to palm oil, paper and pulp, we have committed ourselves to a raw

materials procurement policy that recognizes the risks relating to sustainable development.

We are implementing our decarbonization activities based on the policies noted above. We are working not only to reduce the CO₂ emissions at our own worksites, but also to reduce CO₂ emissions throughout the entire product lifecycle. In addition, we are working actively to provide products and services that contribute toward reducing CO₂ emissions for society as a whole. We are also investing in the development of technologies for using the CO₂ in the atmosphere as raw material, and in activities to realize carbon fixation through tree-planting, etc. Furthermore, with regard to offset measures to support decarbonization in sectors outside our business areas, we recognize the importance of such measures—particularly during the transition period—and we are working to implement them.

Through these activities, we aim to reduce net carbon emissions to zero by 2040, and become carbon negative by 2050. At the same time, we are accelerating the provision of products and services that are adapted to the changing climate, and aiming to realize a Kirei Lifestyle for consumers.

P91 Responsibly sourced raw materials



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

Kao Group Responsible Care Policy
<https://www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/responsible-care-policy.pdf>

Kao Environmental Statement
<https://www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/environmental-statement.pdf>

“High-Risk” Supply Chain Management and Sourcing
<https://www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/procurement-supply-chain-management.pdf>

Strategy

Risks and opportunities

Risks

Transitional risks that we have identified include a possible increase in costs relating to regulatory compliance due to the introduction of carbon taxes, increased expenses relating to product development in response to climate change, and rising raw material costs due to restrictions on the use of fossil fuels.

With regard to physical risks, important risks that we have identified include the risk of flood damage to Kao plants due to the increased frequency of concentrated heavy rainfall occurring over a short period of time, and the possible impact of supply chain disruption on the supply of products.

Opportunities

We have identified opportunities that may contribute toward reduced operating expenses due to the effective utilization of resources based on strategies adopted in response to climate change. We have also identified opportunities for increased sales resulting from the ongoing development of products that contribute toward mitigating the impact of climate change, in response to the changes in market demand caused by a shift toward ethical consumption by consumers.

Strategy

We formulate resilient corporate strategies in response to identified risks and opportunities.

Climate change is a problem that affects the whole of society. In response to this issue, we have proactively set ourselves targets, and by actively developing applications for cutting-edge technologies and other new technologies,

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both within Kao and in the wider society, in collaboration with various stakeholders, we aim to demonstrate solutions to the problem of climate change.

In order to reduce greenhouse gas emissions associated with our business activities, we are improving the energy efficiency of our worksites and shifting over to green energy use, and we are continuing to implement initiatives aimed at reducing emissions in collaboration with our stakeholders, by cutting emissions at every stage in the product lifecycle, from raw materials procurement through to product use, disposal and recycling. We are also working actively to provide products and services that contribute toward reducing greenhouse gas emissions associated with product use.

By providing environmentally friendly products that take account of transitional and physical risk, and products suited to the changes in consumer lifestyles that have resulted from climate change, we are making a positive contribution toward creating a Kirei life for all.

Social impact

By achieving the above goals, we can reduce greenhouse gas emissions and contribute toward mitigating global warming. Additionally, products with low CO₂ emissions during usage can contribute to reduction in consumer spending because they consume less energy and water. Furthermore, they are also effective in reducing the burden of social infrastructure maintenance and renewal concerning energy, water and sewage systems.

Contributions to the SDGs



Business impact

Achieving targets (for energy consumption and greenhouse gas emissions) for all sites in the group leads to higher profits as they contribute to the reduction of business activity operating costs. Additionally, the reduction of CO₂ emissions across product lifecycles can be achieved by reducing raw material use and increasing sales of products with low CO₂ emissions during usage, leading to reduced operating costs and to sales growth.

As renewable energy generating costs have been falling steadily for the past few years, switching over to having 100% of the electricity that we purchase generated using renewable energy can be expected to result in reduced electricity purchase costs in the future.

If no action is taken to reduce usage, then by 2030 our overall CO₂ emissions (Scope 1+2) are forecast to rise to a level that is 1.67 times higher than in 2017. However, in order to control our CO₂ emissions (Scope 1+2), in 2006 we adopted an internal carbon pricing system, and for 17 years now we have been implementing investment decision-making that contributes toward decarbonization, for example through the adoption of energy-saving equipment and equipment with low CO₂ emissions, and through the purchasing of renewable energy. Last year, we changed our CO₂ emissions (Scope 1+2) reduction target from a goal of reducing emissions by 22% by 2030 to one of reducing emissions by 55% by 2030. In order to achieve this goal, when adopting new equipment, we will need, as far as possible, to adopt equipment that has low CO₂ emissions, and if we fail to do so, then not only will we have difficulty in achieving our CO₂ emissions reduction target, the equipment that we purchase may end up becoming stranded assets. With this in mind, we have adopted an internal carbon price system that raised the set price from 3,500 yen/ton-CO₂ to 168 dollars^{*1}/ton-CO₂,

and introduced hot water heat pumps at the Toyohashi Plant in 2022 (scheduled for completion in May 2023) and photovoltaic power generation at the Kashima Plant (scheduled for completion in January 2024). If carbon taxes equivalent to 130 USD/t-CO₂^{*2} are adopted by 2030, then assuming that we achieve the target outlined above, our carbon tax burden will be approximately 7.8 billion yen, which is around 21.0 billion yen less than it would be if we failed to take any action. In this way, by reducing the CO₂ emissions of the products that we manufacture, we are facilitating the supply of products with low CO₂ emissions, and making it possible to meet demand for such products.

^{*1} As it is assumed that new equipment adopted in the future will still be in use after 2030, we have estimated the likely carbon tax rate in 2035 based on the IEA's World Energy Outlook 2021, and changed the base currency from Japanese yen to U.S. dollars from February 2023.

^{*2} World Energy Outlook 2021

Governance

Framework

Risk management in relation to climate change issues is carried out by the Internal Control Committee and opportunity management is carried out by the ESG Managing Committee, under the supervision of the Board of Directors. These committees are both headed by the President & CEO.

The Responsible Care Promotion Committee, which manages policy / regulatory regime and technology risks, and the Risk & Crisis Management Committee, which manages market, reputational and acute risks, are under the Internal Control Committee. These committees are headed by the Executive Officer Responsible for Corporate Strategy.

The Responsible Care Department of Corporate Strategy Division acts as the Responsible Care Promotion

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Committee Secretariat while the Crisis Management Department of Corporate Strategy Division acts as the Risk and Crisis Management Committee Secretariat.

The Responsible Care Promotion Committee meets twice a year to report on and discuss compliance with laws and regulations, status of CO₂ reduction and other matters. It also sets targets for the following year.

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The Responsible Care Promotion Committee Secretariat conducts monthly checks on compliance with laws and regulations, monitors CO₂ emission and water use, mainly at plants which have a large impact, and keeps abreast of the amount of chemical substances in wastewater, reporting on these and other matters to the head of the committee, committee members, members of the Internal Control Committee, auditors and others. The Risk and Crisis Management Committee, which meets four times a year, manages risks caused by natural disasters and reputational risks.

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

Opportunity management relating to climate change issues is handled by the ESG Managing Committee, which meets six 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 Managing Committee which it supervises, discuss climate change and environmental issues as well as social and governance issues.

The committee reports on its activities to the Board of Directors one or more times a year and is audited by the Board of Directors.

Education and promotion

Our employees are not only in a position to develop and supply products, but once they leave the company, they are consumers for the rest of their lives and are among those who select such products. We thus recognize the importance of giving our employees the opportunity to learn about global warming through various programs and to actively engage in decarbonization activities of their own accord.

Starting in 2020, we have begun making and disseminating educational videos for internal use that are specific to the themes of the Kirei Lifestyle Plan (KLP). In 2022, we will continue to promote Kirei Lifestyle Plan activities among employees through the update and distribution of decarbonization content and the rollout of other Kirei Lifestyle Plan goals in the future.

Collaboration with stakeholders

In line with the “eco together” motto of the Kao Environmental Statement, we are working together with a wide range of stakeholders to promote activities aimed at realizing decarbonization. We are also implementing education about decarbonization and working to spread awareness of our initiatives.

“eco together” with consumers/customers

As the product usage stage accounts for around 40% of total product lifecycle CO₂ emissions, raising consumers’ awareness is extremely important. For example, even if a consumer buys single-rinse laundry detergent, if the consumer sets the washing machine to do two rinses, then there will be no reduction in CO₂

emissions. It is thus very important for us to accurately communicate the environmental value that Kao products can provide and encourage consumers to use them properly. By organizing a wide range of different events, we aim to get across the importance of CO₂ emission reduction and the environmental value of our activities and products.

“eco together” with business partners

We aim to realize the Kirei Lifestyle for consumers through “ESG-driven *Yoki-Monozukuri*.” However, this is not something that can be achieved by Kao acting alone. We believe that it is important to share our vision with the business partners at every stage from raw materials procurement through production to delivery and sales, so that we can take action together, and we have established a number of different venues for sharing information with them.

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In particular, as the raw materials stage accounts for around 40% of total product lifecycle CO₂ emissions, we view collaboration with raw materials suppliers as being especially important.

We also view dialogue with investors and other stakeholders as being very important for the sustainable growth of business enterprises and of the planet, and in March 2019 we announced our support for the Task Force on Climate-related Financial Disclosures (TCFD). By proactively implementing the disclosure of information relating to climate change, we are promoting dialogue with investors and other stakeholders.

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"eco together" with society

We proactively participate in activities organized by the United Nations, the central government, local government authorities, and NPOs, etc., where we provide information about our technologies and exchange opinions with other participants.

In order to realize a decarbonized society, reducing the CO₂ emissions associated with electric energy generation is a particularly important approach, and we are working actively to disseminate information about our activities in this area.

Risk management

With regard to transition risk, we are developing and launching low-carbon products. Both SCM, R&D, and related business units will promote the introduction of renewable energy for purchasing in order to produce low-carbon products. For physical risks, we will calculate the cost of risk avoidance for the entire group and formulate a business continuity plan (BCP) that assumes long-term shutdowns.

Targets and metrics

Mid- to long-term targets and 2022 results

We aim to be carbon zero by 2040, and carbon negative by 2050, and we are accelerating our activities to achieve these goals. We will also be maximizing our contribution toward reducing greenhouse gas emissions throughout society as a whole.

2030 mid-term targets

We set ourselves the target of reducing the amount of energy consumed at all Kao Group sites by at least 1% per year, and we have maintained this target every year since 2013.

Our target for the reduction of greenhouse gas emissions at all Kao Group sites (Scope 1+2) has been set, based on the Science Based Targets (SBT) 1.5°C scenario, as a reduction of 55% (in absolute terms, compared to 2017). Our target for the reduction of greenhouse gas emissions throughout the product lifecycle (Scope 1+2+3) has been set, based on the SBT 2°C scenario, as a reduction of 22% (in absolute terms, compared to 2017). Both of these targets have been approved by the SBTi.

In addition, in June 2021 we joined the RE100 global corporate renewable energy initiative, and we have set ourselves the target of having 100% of electricity purchased by all Kao Group sites being generated using renewable energy by 2025, and of having 100% of electricity used by the Kao Group sites being generated using renewable energy by 2030.

In addition, we aim to enable society as a whole to reduce greenhouse gas emissions by the equivalent of 10,000 thousand tons-CO₂ through the provision of Kao Group products and services.

Item	Scope	Target for 2030
GHG emissions (absolute quantity)	Across the entire product lifecycle for the Kao Group	22% reduction (compared to 2017)
	All Kao Group sites	55% reduction (compared to 2017)
Energy consumption (Per sales unit)	All Kao Group sites	1% reduction yearly (year-on-year, from 2021)
Electricity used	All Kao Group sites	100% renewable sources
Contribution to emissions reduction	Products, services	10,000 thousand tons-CO ₂



Long-term targets

Reduction of net carbon emissions to zero by 2040 and becoming carbon negative by 2050

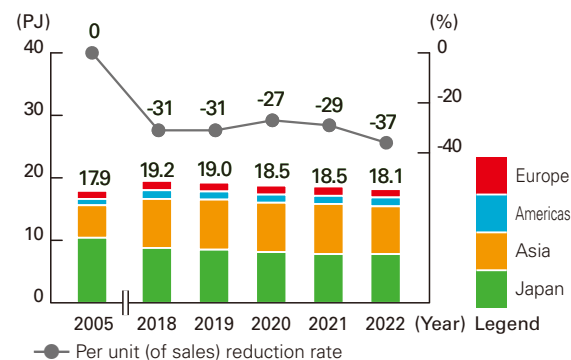
Through our Innovation in Reduction and Innovation in Recycling CO₂ emissions reduction initiatives, and through the various activities that we undertake in collaboration with stakeholders, we are aiming to reduce CO₂ emissions to zero by 2040 and to become carbon negative by 2050.

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2022 results: Actual performance

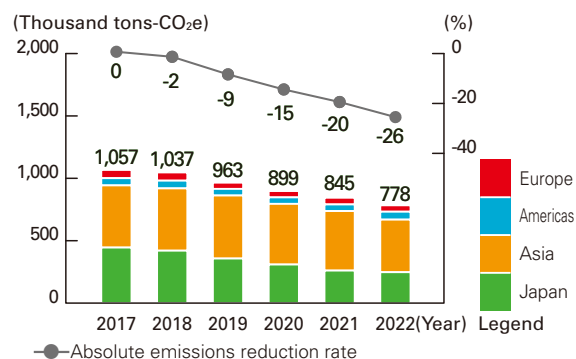
Energy consumption (all sites)



* Boundary: All Kao Group sites, including company cars in Japan

* Assurance provided for energy consumption figures

GHG emissions (all sites)



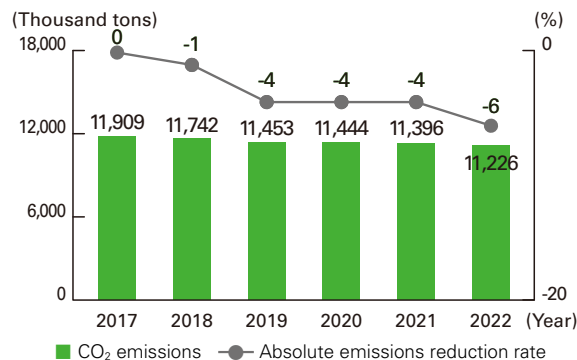
* Boundary: All Kao Group sites, including company cars in Japan

* Gases included: The seven GHGs specified by the Kyoto Protocol (only CO₂ for sites outside Japan)

* Assurance provided for GHG emissions figures

* The values for 2017–2021 have been revised due to the discovery that the electricity purchased for non-production sites in Europe was renewable energy-derived electricity.

CO₂ emissions across the entire product lifecycle (Kao Group)

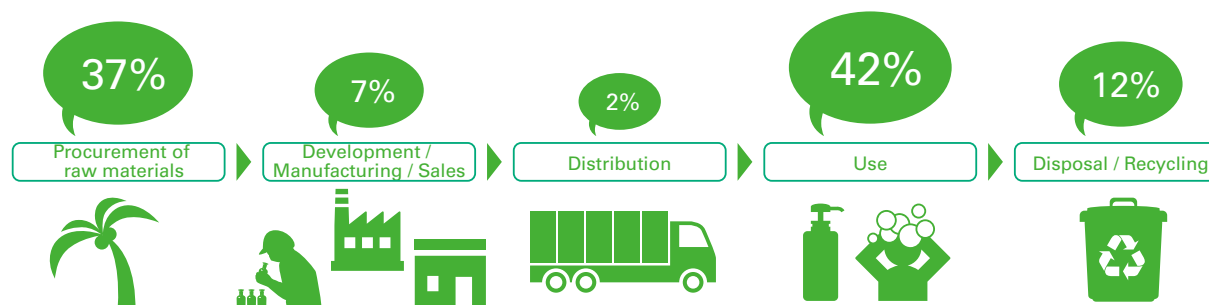


* “CO₂ emissions over the entire product life cycle” is calculated by multiplying the CO₂ emissions over the product life cycle per unit volume of products sold both within and outside Japan (excluding the Group’s production and logistics processes) by the annual sales volume of the product in question and adding up the actual amount of CO₂ emissions over the Group’s production and logistics processes. However, this amount does not include emissions related to the use and disposal of Chemical products.

* Assurance provided for CO₂ emissions figures and absolute emissions reduction rate

* Revised values for 2017–2021 due to the revision of Scope 2 in Europe.

Share of CO₂ emissions accounted for by each state of the product lifecycle for Kao products



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Contribution to emissions reduction

The amount of emission reductions in Kao's business operations as a whole totaled 4,230 thousand tons. Contribution to emissions reduction represents the amount of CO₂ emissions reductions realized by society as a whole through Kao products.

Amortization of carbon credits

The total amount of carbon credits amortized by Kao came to 27 thousand tons.

Electricity purchased and electricity used that is derived from renewable energy (%)

	2018	2019	2020	2021	2022
Electricity purchased	7.6	28.3	37.2	51.8	63.4
Electricity used	5.6	21.6	28.8	39.5	48.6

Reviews of 2022 results

Total lifecycle CO₂ emissions were 170 thousand tons lower than the previous year, and 6% reduction compared to both 2017 and last year. CO₂ emissions increased due to an increase in the market share of dishwashing detergents in Japan, but decreased due to lower sales in Asia, mainly due to urban lockdowns in China, and the introduction of renewable energy at our sites. The main reason for the decline in emissions was slower growth in sales of hand soap and sanitizer (products which had seen a spike in sales due to the COVID-19 pandemic), despite the growth in our overall sales.

Energy consumption for all Kao Group sites combined was 18.1 PJ. Energy consumption per unit of sales was reduced by 10.6% compared to the previous year, surpassing the target of a 1% reduction. Greenhouse gas emissions fell by 26% compared to 2017. Renewable energy accounted for 63% of all electricity purchased, and 49% of all electricity used by the Kao Group.

We offer a wide selection of household products such as water-saving products that reduce CO₂ emissions during the use stage, and also provide various industrial-use products that do the same. We will further expand our range of products that reduce water / hot water and power consumption in the use stage, which contributes a large portion of total lifecycle emissions, and take steps such as reducing the amount of raw materials used and switching raw materials to those made from renewable sources.

Scope 1 CO₂ emissions ☒ (Thousand tons-CO₂e)

	2020	2021	2022
Japan	242	244	240
Asia	278	264	256
Americas	45	45	51
Europe	51	50	48
Total	616	605	595

Scope 2 CO₂ emissions ☒ (Thousand tons-CO₂e)

	2020	2021	2022
Japan	68	19	3
Asia	208	213	173
Americas	6	8	7
Europe	1	1	1
Total	282	240	183

Note: The values for 2020 and 2021 have been revised due to the discovery that the electricity purchased for non-production sites in Europe was renewable electricity.

Note: Emissions by scope conform to the Greenhouse Gas Protocol initiative

Scope 1: GHG emissions emitted directly by the company/ organization

Scope 2: Indirect GHG emissions from purchased electricity, heat, etc.

Note: Emission factors

Scope 1: In principle, uses factors defined in the Act on Promotion of Global Warming Countermeasures

Scope 2: In principle, uses the specific factors of the country's laws or regulations. When the specific factor cannot be obtained, the country-based factor released by the IEA is used.

Purchased electricity, steam, etc. (terajoules)

	2020	2021	2022
Electricity	7,952	7,934	7,634
Heat	0	0	0
Steam	177	232	210
Cooling	0	0	0

Note: Electricity is calculated as the calorific value of the primary energy (at the receiving end in Japan, generating end outside Japan).

Fuel consumption by fuel type (terajoules)

	2020	2021	2022
Natural gas	8,579	8,723	8,553
Diesel oil	1,334	1,095	1,077
Gasoline	99	104	110
Other	132	126	123
Waste vegetable oil (heat recovery)	347	304	346

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Scope 3 CO₂ emissions (Thousand tons-CO₂e)

	2020	2021	2022
1. Purchased goods and services ☑	4,206	4,228	4,109
2. Construction and building of capital goods	259	264	285
3. Fuel- and energy-related activities (not included in scope 1 or scope 2)	59	60	58
4. Upstream transportation and distribution ☑	249	245	241
5. Waste generated in operations	65	68	66
6. Business travel	4	4	5
7. Employee commuting	18	18	18
8. Upstream leased assets	0	0	0
9. Downstream transportation and distribution	111	108	109
10. Processing of sold products	116	131	131
11. Use of sold products ☑	4,653	4,647	4,680
12. End-of-life treatment of sold products ☑	1,438	1,432	1,417
13. Downstream leased assets	0	0	0
14. Franchises	0	0	0
15. Investments	6	5	5
Total	11,184	11,210	11,125

Category 1: Purchased goods and services

This value is calculated by multiplying CO₂ emissions associated with raw materials per unit of product sold (both within and outside Japan) by the total annual sales volume of the product in question.

CO₂ emissions associated with raw materials are calculated by multiplying the weight of raw materials purchased by inventory data (using supplier surveys, documentary data, commercially available databases, etc.).

Category 4: Upstream transportation and distribution

CO₂ emissions associated with transporting products (both within and outside Japan) while Kao Group acts as consignor.

For Japan, the calculation is made using the criteria specified by the Energy Conservation Act. For areas outside Japan, the calculation is made by Kao based on data for Japan.

Category 11: Use of sold products

This value is calculated by multiplying CO₂ emissions associated with product use per unit of product sold (both within and outside Japan) by the total annual sales volume of the product in question. Industrial-use products are excluded.

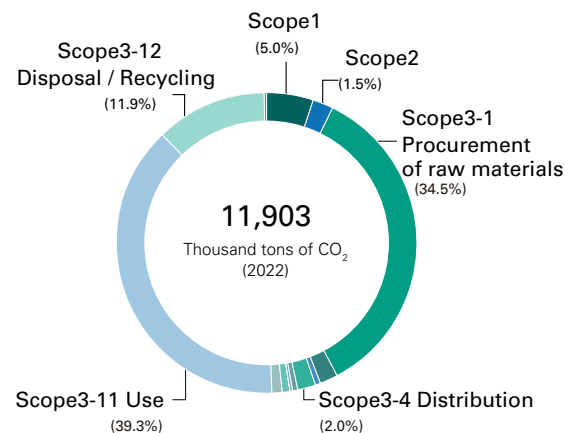
CO₂ emissions associated with product use are calculated by multiplying the amount of water, hot water and electric power consumed during product use by inventory data (using documentary data, commercially available databases, etc.).

Category 12: End-of-life treatment of sold products

This value is calculated by multiplying CO₂ emissions associated with the disposal or recycling of sold products (both within and outside Japan) by the total annual sales volume of the product in question. CO₂ emissions associated with the disposal or recycling of industrial-use products are excluded.

CO₂ emissions associated with disposal or recycling are the sum of CO₂ emissions associated with disposal or recycling of product content and product packaging. Emissions from product content are calculated by converting all content that consists of fossil-derived carbon into CO₂. Emissions from product packaging are calculated by multiplying packaging material weight broken down by the appropriate percentage of disposal by incineration, landfill or recycling for each category of material in line with each country's performance in this regard by inventory data (using documentary data, commercially available databases, etc.).

*Kao focuses on the categories of 1, 3, 4, 5, 11 and 12 related to site activities to save energy and reduce waste materials, as well as on the product lifecycle.



CDP* evaluation

Our initiatives for the environment have been highly rated by the CDP. In 2022, we obtained an A score for each of Climate Change, Water Security and Forests, becoming a Triple A company for the second consecutive year. Only one company in Japan, and 12 worldwide, received a Triple A score in 2022.

* CDP

A non-governmental organization run by institutional investors and headquartered in London. The organization's activities include requiring companies to disclose information on climate change, water, and forests.

CDP evaluation

Area	2018	2019	2020	2021	2022
Climate Change	A-	A	A	A	A
Forest (Palm Oil /Timber)	A- / A-	A- / A-	A / A-	A / A	A / A
Water	A	A	A	A	A
Supplier engagement	A	A	A	A	A



Results of CDP response
CDP 2022 Climate Change
<https://www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/cdp2022-001.pdf>

CDP 2022 Water Security
<https://www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/cdp2022-002.pdf>

CDP 2022 Forests
<https://www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/cdp2022-003.pdf>

Decarbonization GRI 308-2

Main initiatives

Efforts in raw materials procurement

Mitigation

Vendor Summit

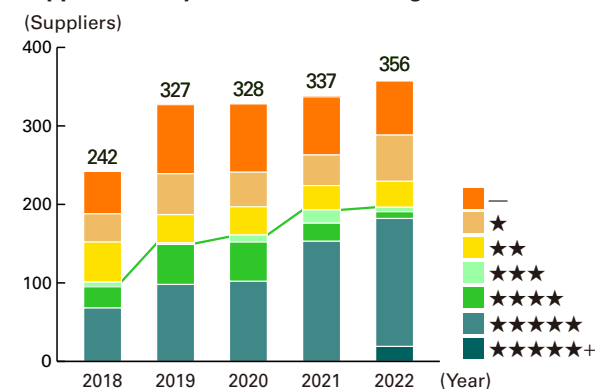
We hold the Kao Vendor Summit, which important suppliers are invited to attend, where we give presentations on our ESG-related initiatives, including decarbonization, and request suppliers' collaboration. The event featured presentations on the activities being implemented by Kao together with suppliers, and invitations to collaborate, with the aim of strengthening ESG-driven procurement (including joining Sedex, participation in the CDP supply chain initiative, etc.) and stable procurement (traceability of raw materials, responding to BCP requirements, etc.).

CDP Supply Chain Program (Climate Change)

In 2009, we became the first Japanese company to participate in the CDP Supply Chain Program. From 2017, in expectation that our suppliers will become more active toward promoting CO₂ reduction activities, we have been evaluating CO₂ reduction activities and have been working to provide the results of these evaluations back to our suppliers. In recognition of these initiatives, Kao was awarded the CDP Supplier Engagement Leader, the highest rating for CDP supplier engagement, for the sixth consecutive year.

The 2022 survey results showed that the number of suppliers obtaining an evaluation of at least "three stars" had increased to 196 compared to the previous survey, indicating that the overall supplier activity level had risen. The number of suppliers who failed to respond to the survey was smaller than in the previous year. We are working on engagement to encourage further enhancement of the level of activity implementation.

Supplier activity level (Climate Change)

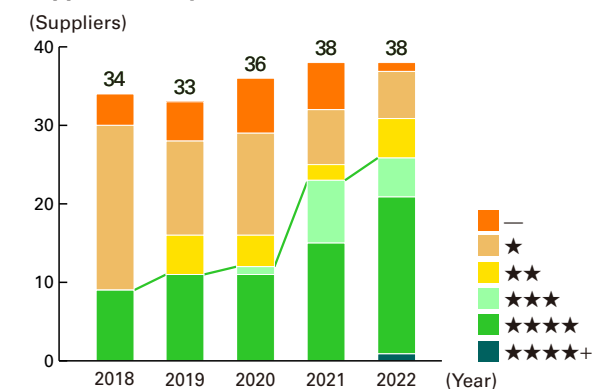


CDP Supply Chain Program (Forests)

We have participated in the CDP "Forest" Supply Chain Program since 2018. We expect suppliers providing palm oil, paper or pulp to begin sustainable and responsible procurement, which includes procurement preventing deforestation. We assess forest activity status and provide suppliers with feedback on the results of this assessment.

The 2022 survey results showed that the number of suppliers obtaining an evaluation of at least three stars had increased by six and the number of suppliers who failed to respond to the survey decreased significantly. We will continue to promote ongoing engagement.

Supplier activity level (Forests)



Low-carbon raw materials procurement

In collaboration with suppliers, we are working actively to adopt raw materials with lower CO₂ emissions by using plant-based and recycled plastics and thinner cardboard. This can make a substantial contribution to reducing CO₂ emissions not only in the manufacturing process but also at the time of disposal and recycling. We have also launched a new initiative to reduce CO₂ emissions from a mid- to long-term perspective, and have joined Genomatica, a leading sustainable materials company, and Unilever as founding members of a venture company to be established in the United States with the aim of supplying alternative palm oil raw materials to the market.

Furthermore, by optimizing the volume and frequency of raw materials deliveries, we are reducing CO₂ emissions in the transport of raw materials.

Decarbonization GRI 308-2

More precise calculation of the environmental burden of raw materials for calculating product lifecycle CO₂ emissions (LC-CO₂)

With the cooperation of those suppliers from which we purchase raw materials that have particularly high CO₂ emissions, we are collecting data on CO₂ emissions produced in the procurement and processing of raw materials. This measure not only improves the accuracy of our CO₂ emission calculations during the raw material procurement process, but also allows us to evaluate the CO₂ emissions reduction initiatives adopted by suppliers, which can then be reflected in lifecycle CO₂ emissions reductions of Kao products.

In 2020, we received the Industrial Science and Technology Policy and Environment Bureau Director-General's Award (Ministry of Economy, Trade and Industry), the highest award, at the Life Cycle Assessment Society of Japan (LCA) Awards, in recognition of our continued initiatives in relation to suppliers.

P91 Responsibly Sourced Raw Materials

Adaptation CDP Supply Chain Program (Water)

Due to climate change, extreme weather is occurring in different places. For instance, there is an increase in short-term, localized torrential heavy rain. Reflecting our focus on strengthening suppliers' awareness of the need to put water risk systems in place in relation to flooding of rivers and sewage systems caused by heavy rain, and on getting them to take appropriate action, we have been participating in the CDP "Water" Supply Chain Program since 2015.

P137 Water Conservation

Developmental efforts Mitigation

When deciding to launch new and improved products, we verify that the products satisfy the environmental standards outlined by the Design for Environment Guidelines. We also evaluate CO₂ emissions over the entire product lifecycle using the same standards. The results of these evaluations are not only used to determine product launches, but are also incorporated in future product development.

In particular, with regard to products that make use of water during the usage process, we recognize that both the water purification plants that provide drinking water for household use and the wastewater treatment plants that process households' wastewater use a great deal of energy and generate CO₂ emissions, and so we are working actively to develop water-saving products. Furthermore, products such as shampoo that require the use of hot water during the usage process also involve the generation of CO₂ emissions in relation to the heating of the water, so making products that use hot water into water-saving products can be very beneficial.

In addition, we aim to achieve "Maximum with Minimum," or in other words achieving the highest possible quality with the minimum possible raw materials. Based on this approach, we developed the Bio IOS surfactant. This surfactant is used in our *Attack ZERO* laundry detergent product.

We have also been working on the development of manufacturing technology for a new type of photovoltaic cell which is expected to be highly efficient.

We are also undertaking technology development aimed at using CO₂ as a raw material for Kao products.

P137 Water Conservation



Photovoltaic cell production technology, which is expected to realize a high energy conversion rate, has been developed through collaborative research undertaken by Kao, the University of Tokyo and Kyushu Institute of Technology
<https://www.kao.com/jp/newsroom/news/release/2019/20190111-001/>
(Japanese)

Adaptation

As global warming progresses, it is apparent that there is a tendency toward higher temperatures and an increased number of sunny days. Demand for UV care products as well as anti-perspirants, etc. is expected to increase during summer. In addition, climate change increases the risk of infectious diseases. In June 2022, *Bioré GUARD Mos Block Serum*, a repellent lotion with innovative Kao proprietary technology, was launched in Thailand to a great response. Additionally, as the probability of droughts occurring increases, the demand for water-saving products is also expected to increase. We are working actively to develop products for which there is high demand in summer, along with water-saving products.

Given that there are expected to be significant restrictions on resource use in future, in order to meet the goals set in the Paris Agreement, there will be high demand for biomass materials that do not compete with food. We have developed Bio IOS surfactant, which uses a type of biomass that does not compete with food and which has not previously been used. Bio IOS surfactant is already in use in our *Attack ZERO* laundry detergent product.

Decarbonization GRI 302-4

Our total investment in environmentally friendly R&D, including climate change response measures, in 2022 was 407 million yen, while the total cost of this R&D work was 7,890 million yen.

Efforts in manufacturing (plants, offices, logistics centers)

Mitigation

1. Efforts to reduce energy consumption

Introduction of high-efficiency equipment and efficient operation of equipment

Continuing from the previous year, equipment such as chillers, air conditioners and compressors were replaced with Best Practice Technologies (BPT) equipment in 2022. Through optimized control using multiple units of air conditioners and compressors, we are operating equipment more efficiently corresponding to fluctuating demand.

In addition, we are switching lights to LED worldwide. Our plants, offices and logistics centers in Japan have accomplished plans announced in 2015, reducing CO₂ emissions by approximately 4.65 thousand tons annually. Affiliated companies outside Japan are also proactively switching to LED lights.

Eliminating energy wastage

As in the previous year, in 2022 we continued to take steps to find areas with wasted energy, reduce energy use to the minimum required, and use energy that was unused in other processes.

Aiming to improve the efficiency of steam use, we are continuing to strengthen our steam trap maintenance and increase the amount of steam we recover. We are also actively implementing improvement activities at worksites to optimize the amount of required energy, including lowering the set

temperature of heat-insulated tanks and shortening operating times.

Striving to eliminate energy wastage at our offices, some of the steps we are taking include turning off unnecessary lights, using presence sensors to automatically turn lights on and off, optimizing air conditioner temperature settings and encouraging people to take the stairs to reduce unnecessary elevator use.

We undertook 177 energy-saving activities at Japanese plants and offices in 2022, resulting in approximately 4,007 tons of CO₂ reduction and 580 million yen in cost reduction for the year.

2. Efforts to use cleaner energy

Clean-burning fuel

Gas fuel, especially natural gas, is the cleanest fossil fuel. We use natural gas at all plants outfitted with the necessary infrastructure. Our plants do not use any coal.

Use of renewable energy

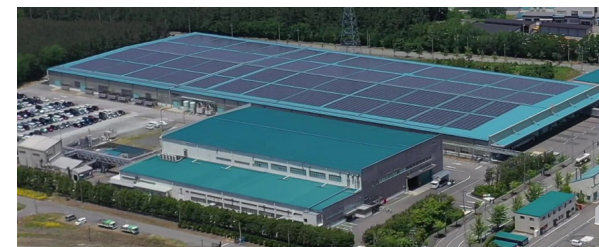
We are promoting the introduction of solar photovoltaic power generation systems for on-site power generation at Kao-owned facilities. In 2022, facilities installed at Quimi-Kao, Kao (Hefei), Kao (Shanghai) Processing, and Kao Spain (Olesa Plant) began generating electricity. The total power generating capacity of these systems was 10,467 MWh in 2022. The generating capacity of individual facilities is shown on the next page.

We are also promoting the purchasing of electric power that is generated using renewable energy. Kao Chemicals GmbH, Kao Manufacturing Germany GmbH, Kao Corporation SA's three plants in Spain, Kao Chimigraf, Molton Brown, Kao USA, Kao Corporation's Sakata Plant, Tochigi Plant, Kashima Plant, Sumida

Office, Kawasaki Plant, Odawara Office, Toyohashi Plant, Wakayama Plant, Arida Training Center, Osaka Office, Ibaraki SP, Seiwa Dormitory, Kiwa Dormitory, Minato Club, Kao Sanitary Products Ehime, Kao Paper Manufacturing Fuji, Kao Logistics, Kao Group Customer Marketing and four plants in China (Kao Corporation Shanghai, Kao Chemical Corporation Shanghai, Kao (Hefei) Co., Ltd. and Kao Huludao Casting Materials Co., Ltd.) have all converted to purchasing only electric power that has been generated from renewable sources.

Kao Industrial (Thailand), Pilipinas Kao, Kao Penang Group, and the Head Office of Kao Corporation also purchase renewable electricity.

Use of this renewable power reduced CO₂ emissions by 219 thousand tons.



Photovoltaic (solar) power generating facilities at Sakata Plant

Decarbonization

GRI 302-4, 305-3, 305-6, 403-7

Total generating capacity of solar power equipment (2022)

Company / Plant	Total generation (MWh)
Sakata Plant, Kao Corporation	2,459
Tochigi Plant, Kao Corporation	1,560
Kao Sanitary Products Ehime	421
Toyohashi Plant, Kao Corporation	399
Kawasaki Plant, Kao Corporation	395
Atsugi Logistics Center, Kao Logistics	240
Wakayama Plant, Kao Corporation	219
Sumida Kita Logistics Center, Kao Logistics	169
Sumida Office, Kao Corporation	34
Kao Corporation Shanghai	824
Kao Industrial (Thailand)	746
Quimi-Kao, S.A. de C.V.	744
Kao (Hefei)	618
Kao (Taiwan)	531
Pilipinas Kao, Incorporated	366
Kao Penang Group	175
KAO CHIMIGRAF, SOCIEDAD LIMITADA	126
Kao (Shanghai) Chemical Industries	121
Kao USA	120
Kao Spain Olesa Plant	113
PT Kao Indonesia Chemicals	46
Kao Austria Handelsgesellschaft mbH	40
Kao Chimigraf Rubi 1 Plant	67
Kao Chimigraf Rubi 5 Plant	59

3. Reducing the volume of leaked refrigerants and other greenhouse gases

Air conditioners and chillers used in manufacturing are charged with fluorocarbon with extremely high global warming potential. To reduce the volume of fluorocarbon leaks from equipment, we have been strengthening our regular equipment inspections.

4. Initiative to secure ZEB Ready certification for office buildings

In August 2020, a newly-built office building forming part of our Sumida Office (in Sumida Ward, Tokyo) was awarded ZEB (Net Zero Emission Building) Ready certification. Through the installation of highly efficient, energy-saving equipment such as highly-insulating external walls and water-based radiant air-conditioning, the new building realizes a reduction in energy consumption of 58% compared to a building with standard specifications. The new building also has solar panels on its roof, along with an emergency generator unit, ensuring that the building is ready to cope with natural disasters.

Adaptation

With rising summer temperatures, heat stroke prevention is essential in Japan. Especially for our outdoor workers, we have taken measures such as to share the day's heat index, shorten continuous working hours and prepare drinking water.

Additionally, as new water risks, including more powerful typhoons and localized torrential rains, are likely to emerge as a result of climate change, annual water risk surveys are conducted at our plants.

Efforts in distribution

Mitigation

CO₂ emissions during distribution in Japan were 102 thousand tons-CO₂ in 2022, a 4.6% increase (compared to 2017).

1. Increase shipment volumes per shipment

We are proactively making adjustments including improving loading efficiency, changing product sizes and using larger vehicles.

2. Shorten shipping distances

We are continuing to look at ways to revise shipping routes, optimize manufacturing plants and shift which logistics center is used.

3. Use cleaner shipping methods

We are pursuing steps such as switching from truck to shipping methods such as rail and ship, which have lower CO₂ emissions (modal shift).

4. Improve loading ratios

Having trucks return from their shipping destination with a load, instead of returning empty after unloading, i.e., improving the loading ratio, contributes to improving energy efficiency and CO₂ emissions in shipping.

We are participating in the Cross-ministerial Strategic Innovation Promotion Program promoted by Japan's Cabinet Office. We have partnered with Lion Corporation to launch a smart logistics initiative, with scheduled deliveries having started in October 2020.

The aim is to enhance the productivity of truck transport and reduce CO₂ emissions by implementing two-way transport that integrates deliveries between Kao's Kawasaki Plant (in Kanagawa Prefecture) and the Sakaide Logistics Center (in Kagawa Prefecture), as well as from the Sakaide Plant (in Kagawa Prefecture) of Lion Chemical (a Lion Corporation affiliate) and the logistics centers at Kazo (in Saitama Prefecture), Kashiwa (in Chiba Prefecture) and Sagamihara (in Kanagawa Prefecture).

This new initiative will achieve shorter empty running distances for the trucks by comparison with conventional transportation methods, and is expected to result in a 45% reduction in CO₂ emissions and a 23% reduction in transport costs for both companies combined.

Decarbonization

GRI 302-4, 302-5, 305-3



Collaborative delivery with Lion Corporation

5. To enhance visualization of distribution-related energy usage and CO₂ emissions

We had been making preparations to begin calculating distribution-related energy usage and CO₂ emissions outside Japan starting from 2020. However, the calculation and reporting of distribution-related CO₂ emissions outside Japan for 2020 has been based on estimates. We are proceeding with preparations to begin reporting of emissions based on actual distribution performance as soon as possible.

Adaptation

With the worsening trend toward short-term, localized torrential rain, there is an increased risk of the supply chain from Kao's plants to our customers being disrupted, with Kao being unable to deliver products on schedule, and a possible need to use roundabout routes over an extended period, leading to an increased environmental impact. When risks appear, in order to take appropriate measures in a short amount of time, subsidiaries are charged with managing product transport to our main market in Japan.

CO₂ emissions from transportation (Japan)



* Boundary: Kao Corporation and Kanebo Cosmetics Inc.

* Assurance provided for CO₂ emissions

Efforts during use

Mitigation

We offer a wide selection of products that contribute to the reduction of CO₂ emissions during the use stage.

Important examples include ultra-concentrated laundry detergents that only require one rinse cycle, and shampoo, body wash and dishwashing detergent that reduce the amount of hot water required for rinsing.

In the laundry detergent segment, in 2009 we launched *Attack Neo*, which reduces the lifecycle CO₂ emissions per wash by approximately 22%. In 2019, we introduced *Attack ZERO*, a concentrated liquid clothing detergent that has redefined the whole concept of clothes washing, which uses Bio IOS, our most advanced ever detergent base, as its main ingredient, and which was followed by *Attack 3X* in 2020. Within Japan, the way in which consumers do their washing has begun to be transformed, with washing machines that come equipped with a button allowing the user to select a single rinse cycle as a standard feature

becoming the norm. Laundry detergents that require only one rinse cycle are offered in Japan and Taiwan.

We also offer other products, such as *Bioré-u the Body Foaming Type*, a body wash, which can be expected to reduce the amount of water used by washing by hand.

To help ensure that when consumers use these products, which are capable of effectively reducing CO₂ emissions, they use them properly, we participate in environmental events hosted by local governments and distribution companies.

We also offer a wide selection of products for industry that allow customers to reduce their CO₂ emissions during the use stage. These include a toner with low-temperature fixing, which reduces the photocopier's power consumption, washing and rinsing agents that can wash and rinse steel plates at low temperature to reduce CO₂ emissions from fuel consumption, a semiconductor wafer cleanser that contributes toward CO₂ emissions reduction by reducing the amount of ultra-pure water and chemical agents used during the cleaning process, an additive for coating material that helps improve fuel economy by reducing the coating weight of wire harnesses for automobiles, and an additive essential to improving dispersion of a required material for fuel-efficient tires to demonstrate their performance.



Attack ZERO, a concentrated liquid laundry detergent

Decarbonization GRI 302-5, 305-3



Bioré-u the Body Foaming Type, a body wash, which can be expected to reduce the amount of water used by washing by hand

Adaptation

As global warming progresses, the period of time for which there is high demand for anti-perspirants etc. in the summer is lengthening, and demand is expected to rise. We are therefore working to strengthen our development of these types of products. Additionally, as the probability of droughts occurring increases, the demand for water-saving products is also expected to increase.

Our *sonaeru* website provides information about household products that will be useful in the unfortunate event of a natural disaster occurring, with a particular focus on products that can help people to maintain good hygiene while living in an evacuation facility.



 Kao sonaeru website
<https://www.kao.co.jp/hisaiji/> (Japanese)

Efforts in disposal and recycling Mitigation

CO₂ emissions in the disposal and recycling stage consist of the following two types. One type is the CO₂ emitted as materials and ingredients degrade when packaging, diapers and other materials disposed of by consumers after use are incinerated, or when wastewater containing cleansing and other agents made from petroleum is treated. The other type is CO₂ emitted from using energy required to operate incinerating and recycling equipment and wastewater treatment facilities. In order to simultaneously address these two types of emissions, the most important thing is to reduce the volume of material subject to disposal and recycling. For this reason, as far as possible we recycle waste that is subject to disposal and recycling. In the case of waste that cannot be recycled and can only be disposed of as waste, we adopt a carbon neutral approach.

In line with this philosophy, we refer to initiatives that reduce the amount of waste that needs to be dealt with as Innovation in Reduction. We are applying Innovation in Reduction to the raw materials used in manufacturing packaging and diapers, and to the cleaning agents used in cleaning products. We refer to initiatives in the area of recycling as Innovation in Recycling. We are applying Innovation in Recycling to packaging and to used diapers.

Used diapers are carbonized using carbonization equipment, and the resulting material is then utilized for environmental purification and plant cultivation. We are also undertaking R&D aimed at conversion to new types of carbon material.

We are proceeding with the utilization of biomass plastic and other raw materials that are carbon neutral in terms of the amount of CO₂ emitted during disposal. As a new initiative, we have started a research on a manufacturing model to utilize cassava residue as biomass as a commissioned project by the New Energy and Industrial Technology Development Organization (NEDO), a national research and development corporation.

P120 Zero Waste

Adaptation

In the future, as the human population continues to increase, it is anticipated that increasingly strict restrictions will be placed on the extraction of fossil fuels, in order to meet the goals of the Paris Agreement, and as a result restrictions can be expected to be placed on the use of various types of resources. We believe that, in order to realize a decarbonized society, it is vital to reduce the amount of raw materials used, recycle used products whenever possible, and

Decarbonization GRI 305-3

only dispose of those products of biomass origin when there is no alternative to disposal.

P120 Zero Waste

Examples of major collaboration projects with stakeholders

- Participation in the Green Value Chain Platform and 2°C Target Network Corporate Edition administered by Japan's Ministry of the Environment, offering Kao's scope 3 efforts as an example and contributing to the calculation of scope 3 emissions by corporations
 - Cool Choice awareness, promoted by the Ministry of the Environment, and the contribution to lifestyle change for consumers toward decarbonization
 - Participation in the Japan Climate Initiative and the spread of information and opinion exchange on climate change measures promoted by various constituents besides the national government
 - Participation as a member of the LCA Working Group organized by the Japan Chemical Industry Association. We have disclosed case studies of our carbon lifecycle analysis efforts, and disseminated information to society about the contribution that chemical products can make toward reducing CO₂ emissions.
 - Participation in the Supply Chain Program run by the CDP for 13 consecutive years. We are contributing toward the enhancement of suppliers' awareness, and toward promoting a transformation of the types of action taken by suppliers.
 - As a member of the steering committee of the TCFD Consortium of Japan, we are contributing toward the disclosure of climate change-related information, and toward the promotion of dialogue.
- In 2022, we were involved with 29 lectures, interviews etc. relating to decarbonization. Our decarbonization initiatives have contributed toward enhancing awareness in society.

Employees' opinions

Decarbonization Initiatives at the Kawasaki Plant



Kawasaki Plant

Decarbonization Activities: Yoshiyuki Osumi
PRD Division Process, Kawasaki Plant
Low-CO₂ Kawasaki Brand: Chiori Ase
Human Capital & General Affairs, District SC, Kawasaki Plant

The Kao Group aims to achieve carbon zero by 2040 and become carbon negative by 2050 in order to make a decarbonized society a reality. With this in mind, our goal is to reduce greenhouse gas emissions from our operations by 55% from our 2017 baseline by 2030 in order to achieve SBT 1.5°C.

Major decarbonization activities at the Kawasaki Plant include: (1) Improving yield by post-blending fragrances, dyes, etc. with liquid detergents (eliminating the washing of mixing tanks) and reducing waste and steam consumption, (2) Improving thermal efficiency by maximizing steam generation at cogeneration plants (reducing city gas consumption), (3) Striving to purchase electricity from 100% renewable sources (achieving RE100), (4) Implementing solar power systems (electricity generation: 351 MWh), and (5) Replacing all lighting at the plant with LEDs. These efforts are expected to reduce greenhouse gas emissions by 28.9% in 2022 compared to 2017 levels. This represents an assumed reduction of 10,502 tons of CO₂. In the

future, we plan to further reduce emissions by considering the introduction of energy services for cogeneration plants (target for 2025).

In November 2022, the grand prize winner of the Low CO₂ Kawasaki Brand* '22 competition was the *Attack ZERO* produced at the Kawasaki Plant. This product was highly rated for its sustainability, which resulted from the performance of our proprietary surfactant "Bio IOS"; high detergency, which reduces the use of detergent during laundering; product concentration, which reduces the use of plastic consumption of containers and improves distribution efficiency; and impact on the public, which was expected to ripple widely because of its familiarity. This was a great reward for the efforts and aspirations of the research, production and business teams who worked together as one during the long process of trial and error in developing new products and industrializing production facilities. We will continue to deliver this product from the Kawasaki Plant to customers throughout Japan with sincerity and share the joy of this award with all employees involved and encourage them in their daily work. We will reduce CO₂ emissions and contribute to a sustainable society together with our customers.

* This program was launched in fiscal 2009 as a way for Kawasaki City to widely recognize and publicize Kawasaki products and technologies that contribute to CO₂ reduction throughout their lifecycle with the goal of achieving carbon neutrality by 2050.

Decarbonization

Stakeholder engagement



Mana Saza

Director, SWITCH

Introduction

2022 was year that saw COVID-19 continue and the Russia-Ukraine War begin. These challenges have immediately brought to light how fragile our societies truly are. So it is with great pleasure to write my views as a youth stakeholder in Kao Corporation's report. In this comment, I will explain the low state of climate literacy in Japan, the role of youth in picking up the pace of climate action, and Kao's role in consumer empowerment to create momentum for climate change measures from Japan to the world.

Youth Stakeholders as New Norm, Marked at COP27

Currently, I am doing research on sustainable development programs at a university in London, a program that was put on hold in 2020 when COP26 was postponed due to COVID-19. Over 330 youth delegates representing more than 140 countries gathered online at Mock COP26 to create a global declaration showing the ambition and dreams of young people worldwide in fighting for a fair, equal,

and green world. We organized the group because we saw the voices of young people being neglected, even though we are the generation that has suffered the most from the climate emergency (MAPA). I was one of the eight core members organizing the movement. At COP26, 25 countries pledged to improve climate education, as written in our declaration. At COP27, we finally secured youth participation in high-level dialogue for the first time at a COP, marking the start to structured participation of youth in decision-making.

Climate Literacy in Critical Danger in Japan

While organizing Mock COP, I returned to Japan and began my journey of spreading the word of youth in climate action, only to realize the willingness to take ownership of climate issues in Japan lags behind

that in the West. Notably, eagerness to alter one's lifestyle and work for climate change in Japan fell by 8% from 2015 to 2021 (Pew Research Center, 2021). On average, 60% of Japanese think that acts for climate change will threaten their quality of life instead of improving it (World Wide Views on Climate and Energy, 2015). The Japanese population's low self-affirmation directly links to the absence of active engagement by individuals in climate change. Based on interviews with 18-year-olds in nine countries, Japanese youths' level of confidence to be drivers for change in our society was the lowest out of the nine at 18.3% (Nippon Foundation, 2019). And although the sustainability literacy of Japanese people may be high, we are substantially lacking in consumer awareness.



Decarbonization

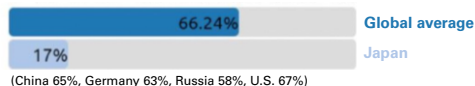
Q. What does climate action look like to you?



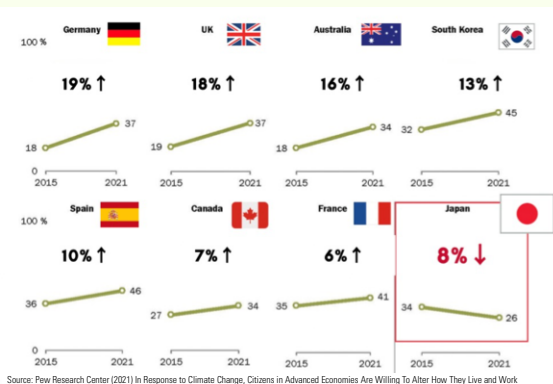
a. Often a threat to quality of life



b. In many cases, it enhances quality of life



WorldWide Views on Climate and Energy, Implemented June 2015



Harnessing Consumer Power to Gain Momentum for Climate

The “Kirei Lifestyle Plan” is an extensive strategy and its achievements are outstanding. Kao has instilled sustainability at the core of its business and the company is a role model for others within and beyond its industry. As its next step, focusing on Scope 3 is imperative since it accounts for 14.4% of Japan’s CO₂ emissions (Greenhouse Gas Inventory Office, 2019). What is more, if Kao can harness consumer power, direct impacts on MAPA (Most Affected People and Areas) will be evident because Japan’s CO₂ emissions rank fifth in the world. To reduce the impact of Scope 3, consumers must learn about the impacts of their current consumption, the risks of the climate emergency, and the benefits of choosing a greener option for both their own health and planetary health in the long term. Responding to the call for planetary health from youth and to protect their future—the highest tier for all organizations. Kao should therefore become the pioneer in quickly forming a “1.5°C lifestyle,” providing consumers—especially those in younger generations—with the know-how and infrastructure for a smooth green transition. Of course, the empowerment of consumers is only feasible with cross-disciplinary partnerships. At the center, designing this new partnership and engagement should involve the future generations as exemplified at COP27.

Conclusion

Our Earth, the very place we call home is literally “on fire.” However, we have the means to put it out, and is just a matter of willingness and active collaboration. To increase the sustainability literacy rate, I chose to create my own NPO in 2021, SWITCH. We work with the UNEP on climate education and are creating our climate change behavior program to teach 3.5% of the Japanese population. According to analysis by Erica Chenoweth, a political scientist at Harvard University, the active participation of 3.5% of a given population will bring fundamental sociopolitical change. I am excited to see Kao join us and in creating this wave of 3.5% and the rest of the world. Let us work in unison to create a Kirei life, for all people and the planet together with youths.