Decarbonization 102-15, 103-1, 103-2, 103-3, 201-2

As we work toward the goal of becoming carbon zero (reducing CO_2 emissions to net zero) by 2040, and becoming carbon negative by 2050, besides aiming to reduce CO_2 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.

Kao's creating value to address social issues

Social issues we are aware of

1. 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)*, 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. Furthermore, with the holding of the COP26 conference in Glasgow in the U.K. in November 2021, growing importance is being attached to the need for effective action. There have also been movements demanding effective action on climate change, such as Friday For Future, in which young people—who represent the future—have played a key role.

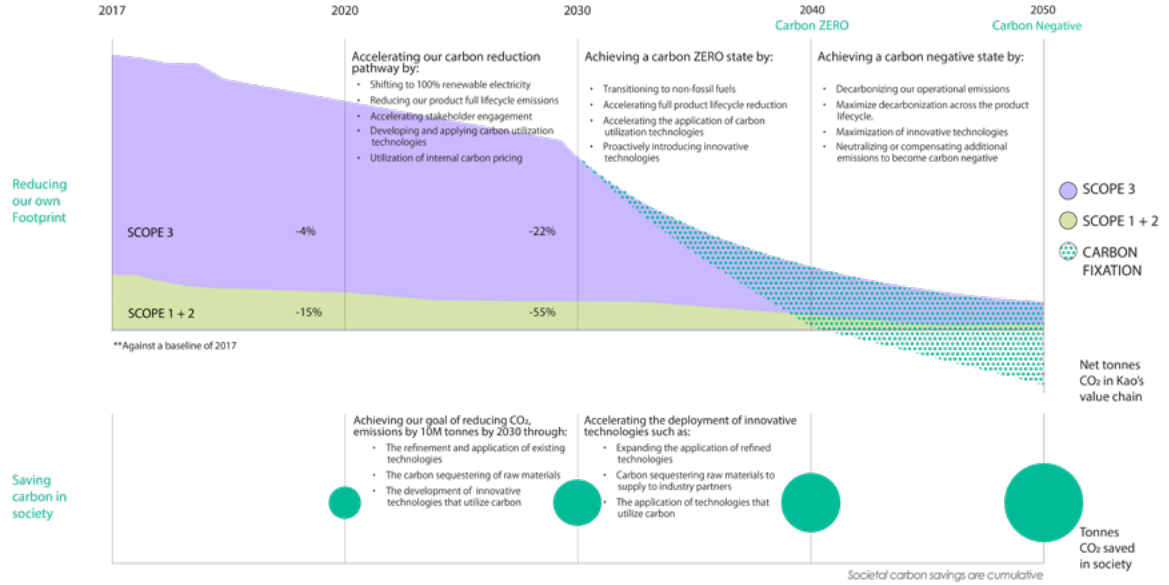
* IPCC
Intergovernmental Panel on Climate Change
This organization was established by the United Nations Environment Programme and the World Meteorological Organization in 1988 for the purpose of conducting comprehensive evaluations from scientific, technical and socio-economic perspectives regarding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

2. 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.

3. 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.



Decarbonization 103-1, 103-2, 103-3, 201-2

4. 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 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 anti-perspirant products	Increased sales in Japan from March to November	+	Increased annual sales in Japan	+	Production planning adjustment
		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

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

Decarbonization 102-12, 103-1, 103-2, 103-3, 201-2

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

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 related to realization of What Kao Aims to Be by 2030

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

Kao's creating value

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, 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.

Contributions to the SDGs

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."

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

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 CO_2 emissions at our own worksites, but also to reduce CO_2

Decarbonization 102-12, 102-43, 103-1, 103-2, 103-3, 404-2

emissions throughout the entire product lifecycle. In addition, we are working actively to provide products and services that contribute toward reducing CO_2 emissions for society as a whole. We are also investing in the development of technologies for using the CO_2 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.

→ P83 Making thoughtful choices for society > Responsibly sourced raw materials

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

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

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

Web "High-Risk" Supply Chain Management and Sourcing
www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/procurement-supply-chain-management.pdf

Education and promotion

Our employees are not only in the position to develop and supply products, but once they leave the company, they are consumers for the rest of their lives and are the ones who select those 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 2020 we disseminated videos on the topics of decarbonization and life-cycle assessment (LCA), and in the future we intend to continue spreading awareness of KLP activities among our employees by developing more video content relating to other KLP objectives.

Collaboration and engagement 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 CO_2 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 CO_2 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 CO_2 emission reduction and the environmental value of our activities and products.

→ P61 Making thoughtful choices for society > Sustainable lifestyle promotion: Collaboration and engagement with stakeholders

Decarbonization 102-12, 102-20

"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.

In particular, as the raw materials stage accounts for around 40% of total product lifecycle CO_2 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.

TCFD | TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

Web Task Force on Climate-related Financial Disclosures
www.fsb-tcfd.org/

"eco together" with society

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

In order to realize a decarbonized society, reducing the CO_2 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.

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 headed by the President.

The Responsible Care Promotion Committee, which manages policy / regulatory regime and technology risks, and the Risk and Crisis Management Committee, which manages market, reputational and acute risks, are under the Internal Control Committee. These committees are headed by the executive officer in charge of the Corporate Strategy.

The Responsible Care Department of Corporate Strategy Division acts as the Responsible Care Promotion 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 CO_2 reduction and other matters. It also sets targets for the following year. The Responsible Care Promotion Committee Secretariat conducts monthly checks on compliance with laws and regulations, monitors CO_2 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 manages natural disaster including caused by climate change and reputational risks, meets four times a year.

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.

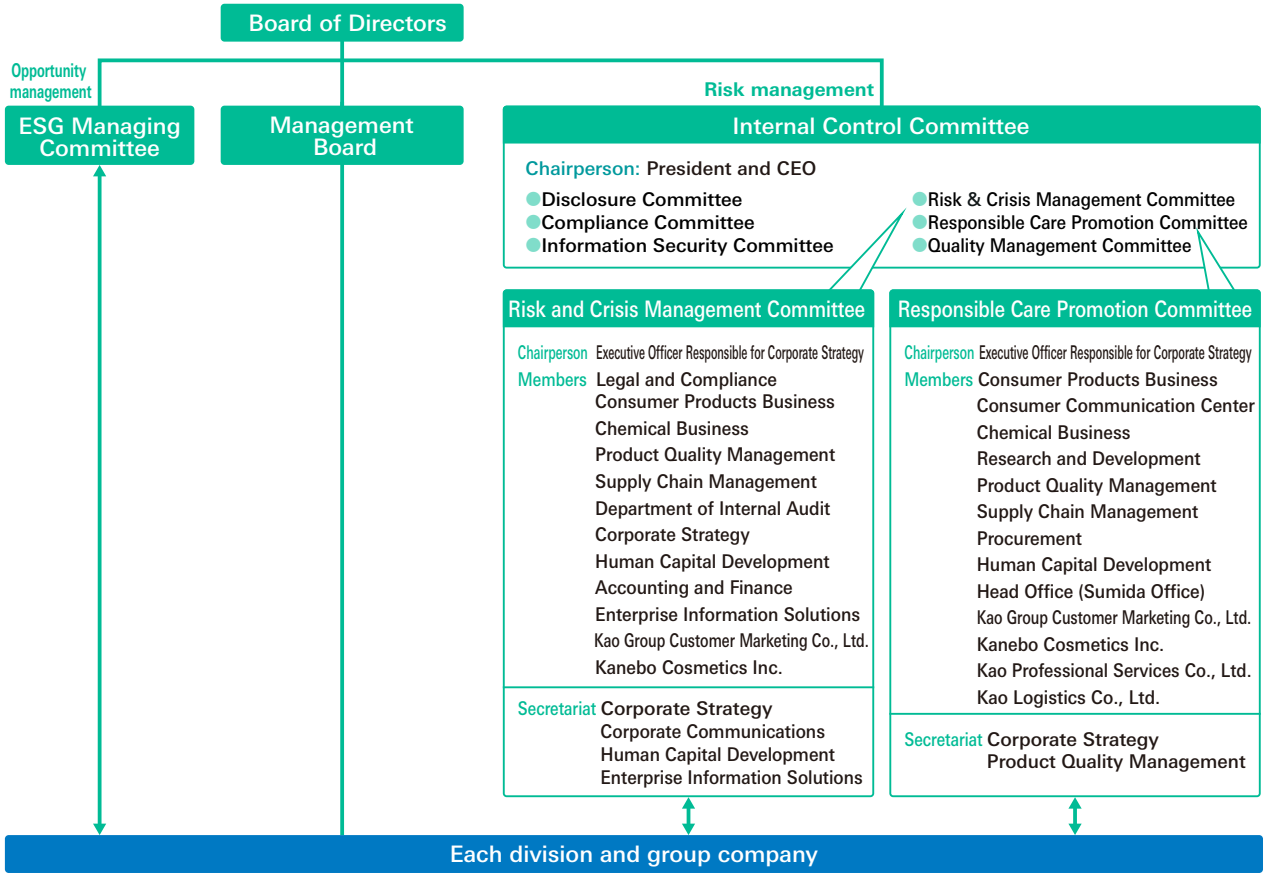
Opportunity management relating to climate change issues is handled by the ESG Managing Committee, which meets six times a year. Committee members are the persons in charge of the Business, Sales, R&D, SCM and other divisions, an arrangement which connects divisions horizontally. The Internal Control 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.

→ P16 Kirei Lifestyle Plan—Kao's ESG Strategy > ESG governance structure

Decarbonization 102-20, 302-1, 302-3, 302-4, 302-5, 305-1, 305-2, 305-3, 305-4, 305-5

Decarbonization promotion structure



* As of December 2021

Mid- to long-term targets and performance

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℃ 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℃ 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 be generated using renewable energy by 2025, and of having 100% of electricity used by the Kao Group sites be 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-CO_2 through the provision of Kao Group products and services.

Decarbonization 302-1, 302-3, 302-4, 302-5, 305-1, 305-2, 305-3, 305-4, 305-5

Index	Scope	2030 targets
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)
Electric power usage	All Kao Group sites	100% renewable sources
Contribution to emissions reduction	Products, services	10,000 thousand tons-CO_2

RE100 | CLIMATE GROUP | CDP

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

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 CO_2 emissions reduction initiatives, and through the various activities that we undertake in collaboration with stakeholders, we are aiming to reduce CO_2 emissions to zero by 2040 and to become carbon negative by 2050.

Anticipated benefits from achieving mid- to long-term targets

Business impacts

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 CO_2 emissions across product lifecycles can be achieved by reducing raw material use and increasing sales of products with low CO_2 emissions during usage, leading to reduced operating costs and 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 CO_2 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 CO_2 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 CO_2 emissions, and through the purchasing of renewable energy. Last year, we changed our CO_2 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 CO_2 emissions, and if we fail to do so, then not only will we have difficulty in achieving our CO_2 emissions reduction target, the equipment that we purchase may end up becoming stranded assets. With this in mind, we have raised our internal carbon price from 3,500 yen per t-CO_2 to 18,500 yen per t-CO_2*1. If carbon taxes equivalent to 130USD/t-CO_2*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 CO_2 emissions of the products that we manufacture, we are facilitating the supply of products with low CO_2 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.
*2 World Energy Outlook 2021

Social impacts

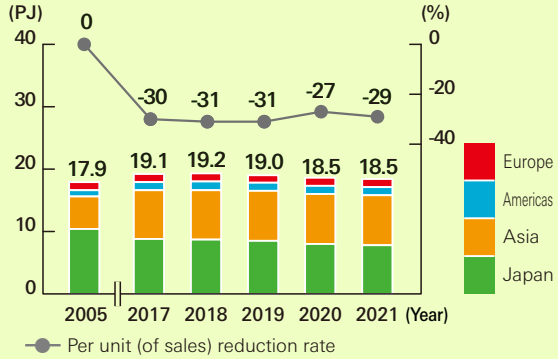
By achieving the above goals, we can reduce greenhouse gas emissions and contribute toward mitigating global warming. Additionally, products with low CO_2 emissions during usage can contribute to reduction in consumer spending because they consume less energy and water. Furthermore, they are also effective in reducing the burden of social infrastructure maintenance and renewal concerning energy, water and sewage systems.

Decarbonization 302-1, 302-3, 302-4, 302-5, 305-1, 305-2, 305-3, 305-4, 305-5

Performance in 2021

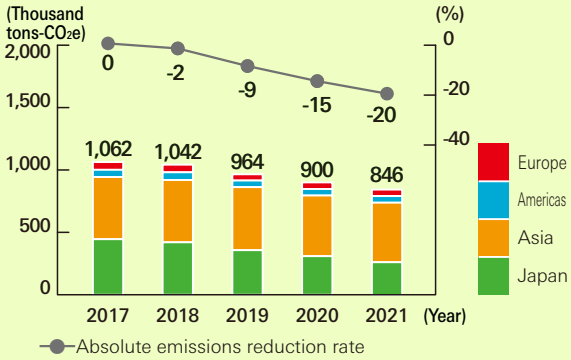
Performance

Energy consumption ☑ (all sites)



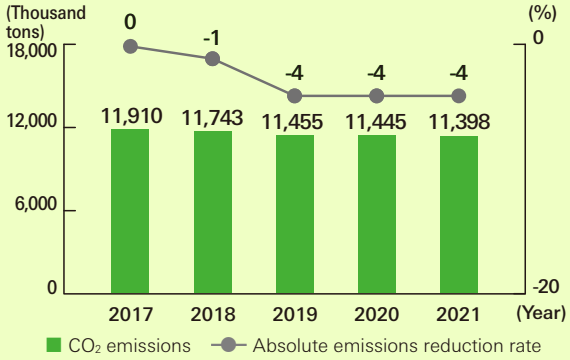
* Boundary: All Kao Group sites including company cars in Japan
* Assurance provided for energy consumption figures

GHG emissions ☑ (all sites)



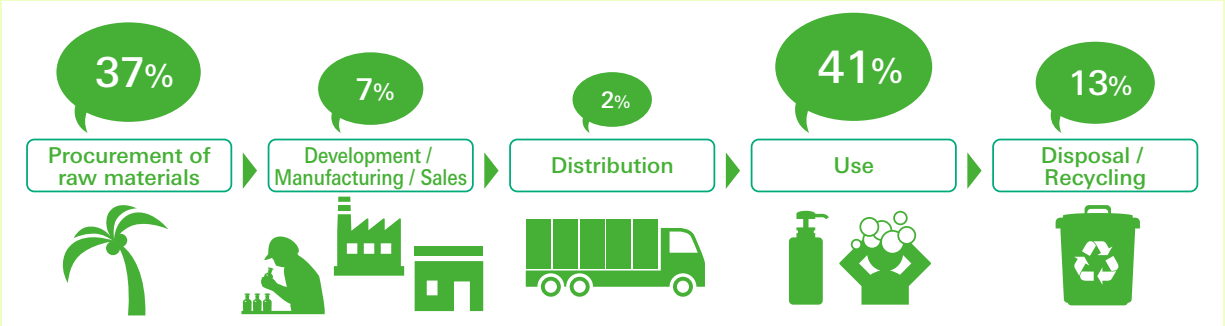
* Boundary: All Kao Group sites including company cars in Japan
* Gases included: The seven GHGs specified by the Kyoto Protocol (only CO_2 for sites outside Japan)
* Assurance provided for GHG emissions figures

CO_2 emissions across the entire product lifecycle ☑ (Kao Group)



* "CO_2 emissions across the entire product lifecycle" is defined as the combined total for the amount of lifecycle emissions of individual products, excluding emissions during manufacturing and distribution, multiplied by their annual sales quantity and the amount of emissions from the group's manufacturing and distribution processes. However, this amount does not include emissions related to the use and disposal of Chemical products.
* Assurance provided for CO_2 emissions figures and absolute emissions reduction rate

Share of CO_2 emissions accounted for by each state of the product lifecycle for Kao products



Contribution to emissions reduction

The amount of emission reductions in Kao's business operations as a whole totaled 4,564 thousand tons. Contribution to emissions reduction represents the amount of CO_2 emissions reductions realized by society as a whole through Kao products.

Decarbonization 302-1, 302-3, 302-4, 302-5, 305-1, 305-2, 305-3, 305-4, 305-5

Amortization of carbon credits

The total amount of carbon credits amortized by Kao came to 29 thousand tons.

Electricity purchased and electricity used that is generated using renewable energy (%)

	2018	2019	2020	2021
Electricity purchased	8	28	37	52
Electricity used	6	21	28	38

Reviews of performance

CO_2 emissions across the entire product lifecycle decreased by 47 thousand tons over the previous year, representing a fall of 4% compared to 2017, the same as in 2020. 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 18.5 PJ. Energy consumption per unit of sales was reduced by 2.9% compared to the previous year, surpassing the target of a 1% reduction. Greenhouse gas emissions fell by 20% compared to 2017. Renewable energy accounted for 52% of all electricity purchased, and 38% of all electricity used by the Kao Group.

We offer a wide selection of household products such as water-saving products that reduce CO_2 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 CO_2 emissions☑ (Thousand tons-CO_2e)

	2019	2020	2021
Japan	259	242	244
Asia	291	278	264
Americas	46	45	45
Europe	48	51	50
Total	644	616	605

Scope 2 CO_2 emissions☑ (Thousand tons-CO_2e)

	2019	2020	2021
Japan	98	68	19
Asia	214	208	213
Americas	6	6	8
Europe	2	2	2
Total	320	283	241

* 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.
* 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)

	2019	2020	2021
Electricity	7,923	7,952	7,934
Heat	0	0	0
Steam	149	177	232
Cooling	0	0	0

* 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)

	2019	2020	2021
Natural gas	8,936	8,579	8,723
Diesel oil	1,405	1,334	1,095
Gasoline	123	99	104
Other	142	132	126
Waste vegetable oil (heat recovery)	493	347	304

Decarbonization 302-1, 302-3, 302-4, 302-5, 305-1, 305-2, 305-3, 305-4, 305-5

Scope 3 CO_2 emissions (Thousand tons-CO_2e)

	2019	2020	2021
1. Purchased goods and services☑	4,295	4,206	4,228
2. Capital goods	342	259	264
3. Fuel- and energy-related activities (not included in scope 1 or scope 2)	30	59	60
4. Upstream transportation and distribution☑	254	249	245
5. Waste generated in operations	56	65	68
6. Business travel	4	4	4
7. Employee commuting	17	18	18
8. Upstream leased assets	0	0	0
9. Downstream transportation and distribution	107	111	108
10. Processing of sold products	111	116	131
11. Use of sold products☑	4,510	4,653	4,647
12. End-of-life treatment of sold products☑	1,432	1,438	1,432
13. Downstream leased assets	0	0	0
14. Franchises	0	0	0
15. Investments	7	6	5
Total	11,165	11,184	11,210

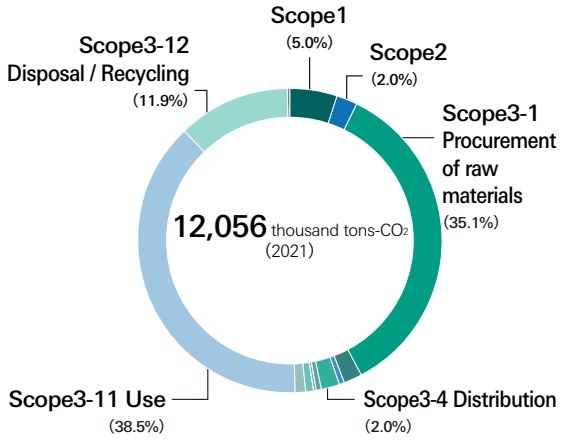
Category 1: Purchased goods and services
This value is calculated by multiplying CO_2 emissions associated with raw materials per unit of product sold (both within and outside Japan) by the total annual sales volume of the product in question. CO_2 emissions associated with raw materials are calculated 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
CO_2 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 CO_2 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.
CO_2 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 CO_2 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. CO_2 emissions associated with the disposal or recycling of industrial-use products are excluded. CO_2 emissions associated with disposal or recycling are the sum of CO_2 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 CO_2. 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 2021, 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 two companies in Japan, and ten worldwide, were given a Triple A score in 2021.

* CDP
CDP is a London-based NGO operated by institutional investors, and it motivates business enterprises to disclose information related to climate change, water and forests.

CDP evaluation

Area	2017	2018	2019	2020	2021
Climate Change	A-	A-	A	A	A
Forests (Palm Oil / Timber)	A-／A-	A-／A-	A-／A-	A／A-	A／A
Water Security	A-	A	A	A	A
Supplier Engagement	A	A	A	A	A

CDP DISCLOSURE INSIGHT ACTION A LIST 2021 CLIMATE WATER FORESTS

Web
CDP 2021 Climate Change
www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/cdp2021-001.pdf

CDP 2021 Forests
www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/cdp2021-003.pdf

CDO 2021 Water Security
www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/cdp2021-002.pdf

Decarbonization 102-12, 102-43, 308-2

Our initiatives

Efforts in raw materials procurement

Mitigation

Vendor Summit

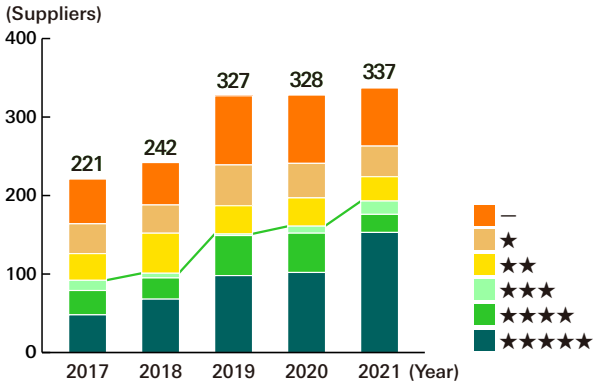
We hold the Kao Vendor Summit, which important suppliers are invited to attend, where we give presentations on our ESG-related initiatives, including decarbonization, and request suppliers' collaboration. In 2021, the Kao Vendor Summit was held remotely. The event featured presentations on the activities 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 CO_2 reduction activities, we have been evaluating CO_2 reduction activities and have been working to provide the results of these evaluations back to our suppliers.

The 2021 survey results showed that the number of suppliers obtaining an evaluation of at least "three stars" had increased to 193 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 a further enhancement of the level of activity implementation.

Supplier activity level (Climate Change)

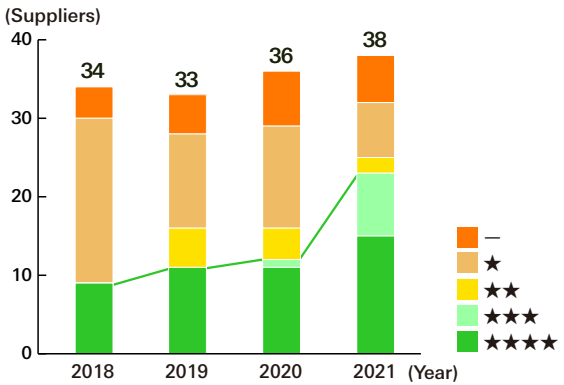


CDP Supply Chain Program (Forests)

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 2021 survey results showed that the number of suppliers obtaining an evaluation of at least "three stars" had increased by ten compared to the previous survey, indicating that the overall supplier activity level had risen. At the same time, in regard to the roughly 15% of suppliers who failed to respond to the survey, we are continuing to work on engagement with these suppliers.

Supplier activity level (Forests)



Low-carbon raw materials procurement

In collaboration with suppliers, we are working actively to adopt raw materials with lower CO_2 emissions by using plant-based and recycled plastics and thinner cardboard. This can make a substantial contribution to reducing CO_2 emissions not only in the manufacturing process but also at the time of disposal and recycling.

Furthermore, by optimizing the volume and frequency of raw materials deliveries, we are reducing CO_2 emissions in the transport of raw materials.

Decarbonization 102-12, 102-43, 308-2

More precise calculation of the environmental burden of raw materials for calculating product lifecycle CO_2 emissions (LC-CO_2)

With the cooperation of those suppliers from which we purchase raw materials that have particularly high CO_2 emissions, we are collecting data on CO_2 emissions produced in the procurement and processing of raw materials. This measure not only improves the accuracy of our CO_2 emission calculations during the raw material procurement process, but also allows us to evaluate the CO_2 emissions reduction initiatives adopted by suppliers, which can then be reflected in lifecycle CO_2 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.

→ P83 Making thoughtful choices for society > 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.

→ P131 Making the world healthier & cleaner > 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 CO_2 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 generated CO_2 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 CO_2 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, in collaboration with the Research Center for Advanced Science and Technology, the University of Tokyo, and with Kyushu Institute of Technology.

We are also undertaking technology development aimed at using CO_2 as a raw material for Kao products.

→ P131 Making the world healthier & cleaner > Water conservation

Web Photovoltaic cell production technology that 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
www.kao.com/jp/corporate/news/rd/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 2020, we launched *Humming Ryokan Technology* fabric softener, which features a breathability mechanism for expelling hot

Decarbonization 102-12, 102-43, 302-4, 308-2

air. 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 and 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.

Our total investment in environmentally friendly R&D, including climate change response measures, in 2021 was 2,770 million yen, while the total cost of this R&D work was 7,754 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 2021. 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 around the world. Our plants, offices and logistics centers in Japan have accomplished plans announced in 2015, reducing CO_2 emissions by approximately 4.65 thousand tons annually. Affiliated companies outside Japan are also proactively switching to LED lights.

Eliminating wasted energy

As in the previous year, in 2021 we continued to take steps to find areas with wasted energy, reduce energy use to the minimum required and use unused energy 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 167 energy-saving activities at Japanese plants and offices in 2021, resulting in approximately 5,327 tons of CO_2 reduction and 190 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 2021, the systems installed at the Sakata Plant, Kawasaki Plant, Kao Chimigraf and PT Kao Indonesia Chemicals started generating electricity. The total power generating capacity of these systems was 6,970 MWh in 2021. 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, Kashima Plant, Sumida Office, Kawasaki Plant, Odawara Office, Toyohashi Plant, 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

Decarbonization 302-4, 305-6

Casting Materials Co., Ltd.) have all converted to purchasing only electric power that has been generated from renewable sources.

In addition, Kao Corporation's Wakayama Plant and Tochigi Plant are purchasing electric power generated from renewable sources.

Use of this renewable power reduced CO_2 emissions by 168 thousand tons.

Photovoltaic (solar) power generating facilities at Sakata Plant

Total generating capacity of solar power equipment (2021)

Company / Plant	Total generation (MWh)
Sakata Plant, Kao Corporation	1,708
Tochigi Plant, Kao Corporation	1,660
Toyohashi Plant, Kao Corporation	413
Kao Sanitary Products Ehime	407
Atsugi Logistics Center, Kao Logistics	274
Sumida Kita Logistics Center, Kao Logistics	219
Wakayama Plant, Kao Corporation	64
Sumida Office, Kao Corporation	42
Kawasaki Plant, Kao Corporation	11
Kao Industrial (Thailand)	781
Kao Corporation Shanghai	558
Pilipinas Kao	370
Kao Penang Group	184
Kao Chimigraf	111
Kao USA	109
Kao Australia	35
PT Kao Indonesia Chemicals	26

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

Air conditioners and chillers used in manufacturing are charged with fluorocarbon that has 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.

Decarbonization 403-7 (Occupational health and safety 2018)

Employees' voice

I-REC purchasing and decarbonization targets at Kao (China)

Wu Xingjue
Business Promotion Group, Production Planning, DS Planning, Kao (Shanghai) Chemical Industries Co., Ltd.

Faced with the problem of climate change caused by global warming, the Kao Group has set itself the goal of helping to realize the decarbonized society, and has formulated new decarbonization objectives. Kao is aiming to become net carbon zero in its business activities by 2040, and to be carbon negative by 2050.

So as to meet these objectives, every Kao (China) plant is speeding up its activities to reduce carbon dioxide emissions. In 2019, Kao (China) set up an I-REC Promotion Team, and it was decided that each plant in China would systematically purchase I-REC certificates and switch over to purchasing only electricity that has been generated using renewable energy. I-RECs meet the requirements of the CDP and of the RE100 initiative, and can be used to offset Scope 2* carbon dioxide emissions. "I-REC" stands for International Renewable Energy Certificate. Also known as a "Green Electricity Certificate" ("green electricity" includes electricity generated using wind power, solar power and hydroelectric power), an I-REC represents proof, certified by an internationally recognized organization, of the purchase of green electricity.

In the case of Kao (China), five of its plants—Kao Corporation Shanghai, Kao (Hefei), Kao Chemical Corporation Shanghai, Kao (Shanghai) Chemical Industries and Kao Huludao Casting Materials—have acquired I-RECs, and have been able to ensure that 100% of the electricity that they purchase is generated using renewable energy.

Based on the actual energy consumption of the five plants of Kao (China), the total amount of electricity generated using renewable energy that was purchased was 28,483 MWh in 2020 and 36,152 MWh in 2021. Given that we purchased a combined total of 64,635 MWh of green electricity in 2020 and 2021, the electric power consumption by the five plants over these two years was able to offset the equivalent of 37,740 tons of carbon dioxide emissions.

As the green electricity purchased in 2020 was generated using wind power, this represented support for the operation of wind power generating facilities in China's Yunnan Province and Xinjiang Uyghur Autonomous Region. The green electricity purchased in 2021 was generated using hydroelectric power, and represented support for hydroelectric power projects within China.

The plants of Kao (China) will continue working tirelessly to save energy and reduce emissions through continued technological innovation and ongoing improvements, aiming to achieve the goal of being carbon neutral across the board by 2050.

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

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.

Decarbonization 305-3

Efforts in distribution

Mitigation

CO_2 emissions during distribution in Japan were 100 thousand tons-CO_2 in 2021, a 0.3% 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 CO_2 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 CO_2 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 CO_2 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 reduce the distances that trucks are travelling without loads, by comparison with conventional transportation methods, and is expected to result in a 45% reduction in CO_2 emissions and a 23% reduction in transport costs for both companies combined.

Collaborative delivery with Lion Corporation

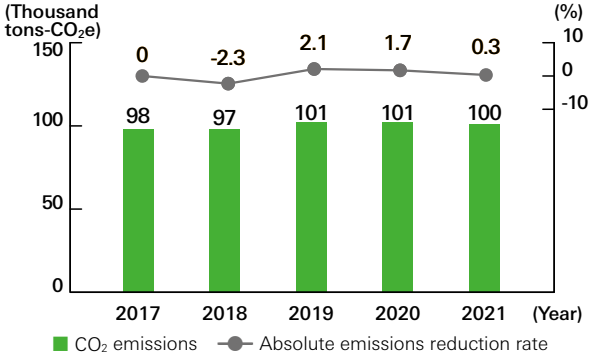
5. To enhance visualization of distribution-related energy usage and CO_2 emissions

We had been making preparations to begin calculating distribution-related energy usage and CO_2 emissions outside Japan starting from 2020. However, the calculation and reporting of distribution-related CO_2 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.

CO_2 emission during distribution☑ (Japan)



* Boundary: Kao Corporation and Kanebo Cosmetics Inc.
* Assurance provided for CO_2 emissions

Decarbonization 305-3

Efforts during use

Mitigation

We offer a wide selection of products that contribute to the reduction of CO_2 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 CO_2 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 foam-type shampoo, which can be expected to reduce the amount of water used when foaming and rinsing.

To help ensure that when consumers use these products, which are capable of effectively reducing CO_2 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 CO_2 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 CO_2 emissions from fuel consumption, a semiconductor wafer cleanser that contributes toward CO_2 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

Merit the Mild Foaming Shampoo and Conditioner is expected to reduce the amount of water used when getting shampoo and conditioner to foam and when rinsing the hair

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.

Web Kao sonaeru website
www.kao.co.jp/hisaiji/ (Japanese)

Decarbonization 102-12, 102-43, 305-3

Efforts in disposal and recycling

Mitigation

CO_2 emissions in the disposal and recycling stage consist of the following two types. One type is the CO_2 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 CO_2 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 CO_2 emitted during disposal.

To further strengthen our focus on recycling activities, in 2020 we established the Recycling Science Research Center within our R&D Division.

→ Making the world healthier & cleaner > Zero waste
P113

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

→ Making the world healthier & cleaner > Zero waste
P113

Examples of major collaboration projects with stakeholders

- Participation in the Business Ambition for 1.5°C program promoted by the SBTi. We are taking part in related activities together with many leading global companies.
- 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 CO_2 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 2021, we were involved with 29 lectures, interviews etc. relating to decarbonization. Our decarbonization initiatives have contributed toward enhancing awareness in society.

Decarbonization 102-44

Stakeholder engagement

Yukari Takamura
Professor, Institute for Future Initiatives, the University of Tokyo

In recent years, natural disasters resulting from severe weather have caused immense damage, both in Japan and globally. The latest meteorological science indicates that human activity has definitely been a cause of global warming, and predicts that the changes in the climate will become even more dramatic as temperatures continue to rise. At the COP26 conference held in Glasgow in the U.K. in 2021, agreement was reached on the need to resolutely pursue the achievement of the Paris Agreement goal of keeping the increase in average global temperatures (compared to pre Industrial Revolution levels) down to within 1.5°C, and it was confirmed that, to realize this goal, emissions reductions over the next ten years, during the period until around 2030, would be of decisive importance. The agreement reached at COP26, set against the background of a sense of crisis in relation to the science-based evidence for climate change, shows just how much importance investors, and society as a whole, will attach to companies' response to climate change risk in the future.

The Kao Group has positioned realizing the wholehearted satisfaction and enrichment of the lives of people globally and contributing to the sustainability of the world as the core of the Kao Way, its business philosophy, and it has become leaders in sustainability initiatives, including those addressing the issue of climate change.

In 2021, Kao made substantial further progress with these initiatives. In May 2021, it formulated new decarbonization objectives, aiming to reduce its carbon dioxide emissions to net zero by 2040 and become carbon negative by 2050. In 2019, Kao had already secured approval for its goals from the SBTi, which encourages business enterprises to set targets that are in conformity with the long-term goals of the Paris Agreement, and in 2021 it signed up to the Business Ambition for 1.5°C initiative, which asks companies to set targets consistent within keeping the average rise in global temperature within 1.5°C.

In addition, in line with its goal of becoming net carbon zero by 2040, Kao has begun participating in the international RE100 initiative, which seeks to have 100% of electricity used in business be generated from renewable energy. Kao has set itself the objectives of purchasing only electricity that has been generated using renewable energy within Japan by 2023, and achieving this globally by 2025, which is even earlier than RE100 recommendations. Besides implementing measures such as installing solar power generating equipment to generate electricity for its own use, and reducing the CO_2 emissions of the electricity that it purchases to net zero through the use of non-fossil fuel energy certificates, as has been done at the Sakata Plant, Kao has also begun using corporate Power Purchase Agreements, through which it purchases renewable energy directly from the power producers.

As in 2020, once again in 2021 Kao was selected as a Triple A company, having secured the highest possible A rating in all three areas covered by the CDP survey: Climate Change, Forests and Water Security. This achievement reflects just how high a level of initiatives the Kao Group has been implementing.

Going forward, everyone will need to set themselves even higher challenges in responding to climate change. In particular, there is a need to reduce emissions throughout the product lifecycle (Scope 3 emissions). Emissions associated with raw materials procurement, product use, disposal and recycling account for the largest share of the Kao Group's total emissions. Kao needs to collaborate and liaise with suppliers in regard to reducing emissions associated with raw materials procurement, and collaborate and liaise with customers and other stakeholders in regard to reducing emissions associated with product use, disposal and recycling. I anticipate Kao implementing measures that will encourage suppliers to make improvements, and measures that will change the lifestyles and behavior of customers through its products and services. A further point is that the key issues which we are facing—including climate change, plastic resource circulation and safeguarding the natural environment—are all mutually interconnected. I hope that Kao will be able to strengthen understanding of all these issues among both suppliers and customers, and implement initiatives that address them all in a coordinated, comprehensive manner.