

Air & Water Pollution Prevention

We will protect human health and the natural environment by preventing substances from being released into the water and air through the manufacture and use of our products.

Social issues

Air pollution, water pollution, and soil contamination can have a significant negative impact on human health, on agricultural crops and other plants, and on ecological systems.

Atmospheric pollutants such as nitrogen oxides (NO_x), sulfur oxides (SO_x), particulate matter (PM) and volatile organic compounds (VOCs) are known to increase the prevalence of pulmonary diseases such as asthma. Most atmospheric pollutants derive from the burning of fossil fuels or the usage of organic solvents. Worldwide, around 8.8 million people die prematurely each year because of atmospheric pollution. In Europe alone, the figure is believed to be over 790,000 (according to a study by the University of Mainz in Germany). At the same time, in recent years there has been a trend for indoor spaces to be made as airtight as possible in an effort to make homes more energy-efficient. As a result, chemical substances in indoor spaces remain in those spaces for long periods of time, and their concentration levels rise. A report (by Yokohama National University in Japan) suggests that this can have a negative impact on human health.

The vast majority of living organisms, including human beings, cannot live without water. Humans also need access to sanitary water in order to maintain lives of cleanliness. The main causes of water pollution are various substances contained in wastewater from plants and household sewage.

Negative impacts on human health resulting from soil contamination include the effects of both direct contact with polluted soil by touching it or eating it and indirect contact by using groundwater that has been polluted with harmful substances that have leached out

from polluted soil. Significant characteristics of soil contamination include the fact that, once soil contamination starts to occur, harmful substances can accumulate in the soil over a long period, and the fact that people are less likely to be aware of soil contamination than they are of air pollution and water pollution.

Policies

To create a Kirei life for all, besides conducting our business activities in a way that does not impose negative impacts, we also aim to collaborate with stakeholders to address pollution that has already had negative effects, and to restore things to a sustainable state.

We utilize a wide range of chemical substances in our products, from home-use products to industrial products, and we continue to implement activities to minimize the negative impacts of chemical substances at every stage, from development to post-use disposal.

Specifically, our efforts are guided by the following policies.

- [Basic Principle and Basic Policies on Environment and Safety](#)

We undertake to offer products with a lower environmental impact by assessing environment and safety aspects throughout the entire lifecycle of the products, from manufacture through disposal, when developing products and technologies.

- [Kao Group Responsible Care Policy](#)

We declare that we will strive to develop technologies for products that consumers and customers can use with peace of mind, as well as endeavor to provide

products that have a low environmental impact, and that we shall strive to continue to reduce the environmental impact of our business activities by disposing of wastewater and waste gas appropriately.

- [Environmental Statement](#)

We hereby declare our commitment: Kao products utilize original Kao-developed technologies to minimize the impact they have on the environment, not just in the manufacturing process, but at the usage stage as well. From raw materials procurement to final disposal, we want to engage in 'eco together' with various stakeholders throughout the product lifecycle.



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

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

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

Air & Water Pollution Prevention

Strategy

Risks and opportunities

Risks

Item		Content
Risks	Transitional risk	<p>Policies, laws and regulations</p> <p>Various policies and legal restrictions on air and water will be enacted, and management costs may increase to comply with them. Investing in better facilities and developing new technologies to comply with policies and regulations will mean higher equipment and operating costs, which could negatively impact our profitability.</p> <p>Additionally, the delayed production schedule could negatively impact sales if national and local governments are urged to pass restrictions on operations due to the state of air pollution in areas where our plants are located and the state of water pollution from plant wastewater discharged in public water.</p> <p>Examples of possible policy or regulatory restrictions</p> <ul style="list-style-type: none"> • Air pollutant regulations • Regulations on substances depleting the ozone layer • Plant wastewater regulation • Regulation of use of chemical substances in products • Product labeling programs for environmental performance or chemical substance
		<p>Technology</p> <p>Increasing research and development expenses to address the risks posed to air and water quality will mean higher operating costs, which could negatively impact our profitability. Furthermore, there is a risk that sales growth will not be achieved in the event of failure of technological development.</p>
		<p>Markets</p> <p>When regulations on air pollutants are tightened on a national or regional level, demand for chemical products that contain few or no substances causing air pollution (such as organic solvents) increases, whereas sales for conventional chemical products are at risk of decline.</p> <p>When regulations on water pollutants are tightened on a national or regional level, demand for professional-use products that contain few or no substances causing water pollution (such as alkali) increases, whereas sales for conventional professional-use products are at risk of decline.</p> <p>Sales could be negatively impacted if technological capabilities for products in development are not on par with market demands.</p>
		<p>Reputation</p> <p>Our brand owner's reputation is at risk of decline due to the so-called fragrance pollution from scents in fabric softeners and others.</p>
	Physical risk	<p>Acute</p> <p>Our plants may suspend operations and be unable to continue manufacturing products due to air pollution from forest fires or water pollution from oil tanker accidents. Similar conditions at suppliers' plants could make it impossible for us to procure raw materials, leading to the risk of not being able to continue manufacturing products. There is also a risk that supply chains, from suppliers to our plants, and from our plants to our customers, could be interrupted. These risks would negatively impact sales as we would no longer be able to supply our products to the market, and if such risks actually materialized, would require special measures at additional cost, thus reducing our profits.</p> <p>In addition, if large-scale air and water pollution significantly restrict the lives of consumers, consumption might fall, which would negatively impact sales.</p>
<p>Chronic</p> <p>There is a risk that production may be unable to increase at the rate required for future growth due to our plants or supplier's plants being located in areas where air and water pollution are likely to become more severe.</p>		

Opportunities

Opportunities	<p>Resource efficiency</p> <p>Optimizing logistics and reducing the empty running distances for trucks will curtail emissions of air pollutants and lower transportation costs, which would lead to improved profits.</p>
	<p>Products, services</p> <p>PM, a type of air pollutant, not only has health consequences but, in terms of beauty, it can also cause dull skin. Coal-fired power generation is expected to decline, decreasing the amount of PM in the atmosphere in the medium to long term with the objective of reducing greenhouse gas emissions. However, it is expected to take some time for PM to disappear from all regions around the world, which presents an opportunity for products that respond to PM in the Health & Beauty Care business and the Hygiene & Living Care business.</p> <p>In the industrial sector, there are opportunities for chemical products that reduce organic solvents and dust causing air pollution at <i>Genba</i>.</p> <p>Many of our products are discharged into the water environment after use. Surfactants powerful enough to reduce the usage of surfactants and alkali-free professional-use detergents offer an environmental value that improves water environments.</p>
	<p>Markets</p> <p>The manifestation of air pollution caused by PM presents increased sales opportunities by attracting attention to consumer products that respond to PM. Strengthened regulations on organic solvents and dust at <i>Genba</i> present an opportunity to expand demand for chemical products that comply with such restrictions.</p>
	<p>Resilience</p> <p>Ongoing measures for air pollution and wastewater pollution at plants help increase our resilience to issues with air and water quality in terms of product manufacturing. In addition, the resilience of our businesses needs to be improved with activities suggesting new products by predicting consumer trends based on consumer feedback from the last 60 years or more and a database built over more than 40 years.</p>

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GRI 303-2

Strategy

We are implementing activities to prevent air and water pollution at our manufacturing sites. In the event that environmental pollution from any of our sites is detected, we may be forced to halt production activities, so activities that prevent environmental pollution are essential for business continuation. It is also important to develop products that do not lead to environmental pollution when used.

We are working to prevent air pollution and water pollution in the areas near Kao's production plants by reducing emissions of atmospheric pollutants such as NOx, SOx and volatile organic compounds (VOC) from our plants and reducing organic matter and other substances in wastewater discharged from our plants, by complying faithfully with the relevant laws and regulations in each country and region in which we operate, and by setting reference values that are even more rigorous than those required by law to strictly manage pollutants.

In relation to air pollution, our Chemicals Business offers various products for dealing with these issues in order to help maintain the health of working people around the world.

To ensure the groundwater used by locals is not polluted, we periodically survey the soil conditions at each plant for water pollution.

Additionally, we propose various products to help prevent water pollution in all our business units for household, professional-use and chemical products.

Social impact

Disclosing VOC and COD emissions pertaining to our business activities, and engaging in an ongoing dialogue

about this, will improve communication with the residents around our plants and lead to reduced reputational risks concerning these emissions throughout society.

Contributions to the SDGs



Business impact

Disclosing VOC and COD emissions pertaining to our business activities will improve the transparency of occupational safety activities and anti-pollution measures, as well as corporate credibility.

In addition, increased loyalty and higher product sales will follow once stakeholders recognize our initiatives to prevent environmental pollution and understand their value.

The fact that Kao products are likely to be needed to maintain cleanliness in areas where environmental pollution and hygienic conditions are a challenge will also contribute to increased sales.

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

P25 Our ESG Vision and Strategy > Governance

P301 Responsible Care Activities > Governance

Education and promotion

We recognize the importance of giving our employees who handle chemical substances a variety of opportunities to obtain knowledge about the impact our business activities and products may have on the quality of air and water, and to voluntarily and actively engage in pollution prevention activities. We have created many opportunities for employee education accordingly.

Employees are responsible for air and water pollution prevention activities at the plant, as well as research and development of low-VOC and highly biodegradable products. Strengthening employees' air and water quality awareness helps to enhance the

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overall level of our activities in this area. Furthermore, employees are also consumers, and in their role as consumers it is important that they take steps to prevent air and water pollution.

Specifically, we conduct environmental education including air and water pollution prevention for all employees as part of our Responsible Care (RC) activities. We also provide education encompassing the importance of legal compliance pertaining to air and water pollution to all employees working at plants and research institutes that have obtained ISO 14001 or RC 14001 certification.

Collaboration with stakeholders

We recognize that, to help consumers realize the Kirei Lifestyle, we must deepen mutual understanding with a wide range of stakeholders and collaborate with them.

As the substances generated by our production activities that lead to air and water pollution affect local communities, clear and open communication with them is crucial. Many of our plants compile an annual environmental report, and communicate with local residents.

The emission of substances linked to air and water pollution pertaining to our business activities is regulated by government agencies. We have established our own voluntary management criteria, which are even more rigorous than the statutory requirements, and we comply with these to monitor pollutants. Additionally, we continue to conduct water quality surveys not as a single company but as an industry group.

Logistics initiatives are also required to help make improvements in air pollution. As such, we are taking

part in programs established by the Cabinet Office in collaboration with other companies in this industry.

Consumer behavior also needs to change in order to attain the Kirei Lifestyle. We provide opportunities for consumers to think about the Kirei Lifestyle through visits to museums or plants on the subject of the water that all of them use daily. For example, the Eco-Lab Museum has displays on household sewage and wastewater treatment.

Risk management

Regarding the process of assessing risks and opportunities, the Risk Management and RC Promotion examine risks and opportunities anticipated at Kao and conduct risk and opportunity assessments based on feedback from outside experts and staff in internal departments that are undertaking initiatives. These are approved by the Internal Control Committee and ESG Managing Committee, respectively.

Integration into corporate risks

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

Metrics and targets

Mid- to long-term targets and 2023 results

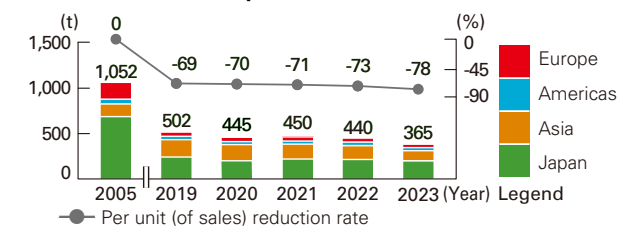
2025 long-term targets

Item	Scope	Targets for 2025
% of plants which disclose VOC and COD emissions	All Kao Group sites	100% disclosure

2023 results

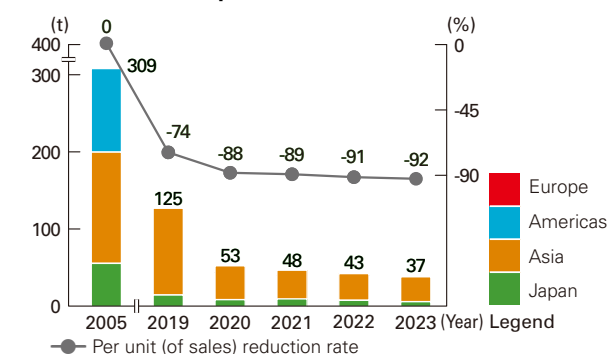
* Per unit of sales was calculated based on Japanese GAAP in FY2005, and based on International Financial Reporting Standards (IFRS) from FY2017 onwards.

NOx emissions (all production sites)



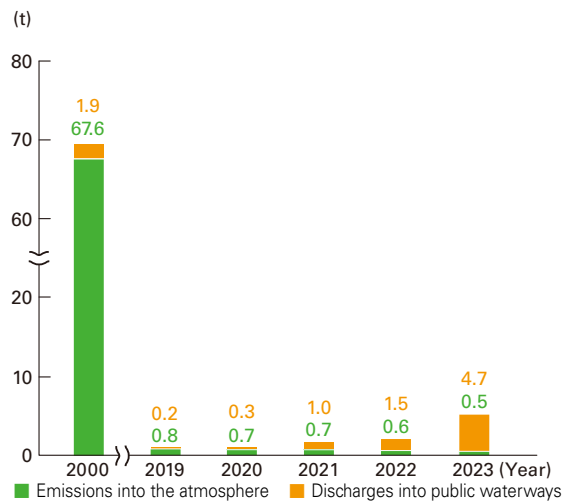
* Assurance provided for NOx emissions

SOx emissions (all production sites)



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Total emissions of chemical substances subject to the PRTR system



* The PRTR Law changed in April 2023, so the figures for 2023 are the actual results for the period from April to December for the chemical substances subject to the law after the change.

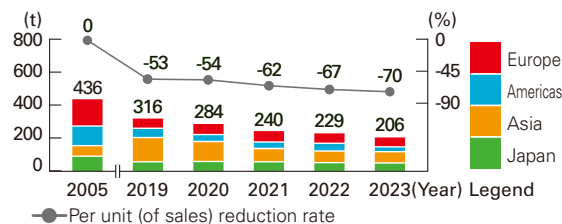
Emissions of volatile organic compounds (VOCs)

Although we have no facilities subject to the VOC emission regulations provided in the Air Pollution Control Law, we work to voluntarily cut VOC emissions.

For the 100 VOC substances defined in the notice issued by the Director General of the Environmental Management Bureau, Ministry of the Environment, we set voluntary targets on the annual atmospheric emissions from each plant for each substance (5 tons or less in 2005, 3 tons or less in 2009, 1 ton or less in 2010), conducted emission reduction activities and accomplished our targets. We are managing VOC emissions with the current target of maintaining our activities.

Plants of the Kao Group in Japan handled 30 types of VOCs in quantities over 1 ton in 2023, with total emissions into the atmosphere of 5.0 tons .

COD pollution load (all production sites)



* The amount of COD pollution load for wastewater entering sewage systems takes into account the removal rate from sewage systems.
* Assurance provided for COD pollution load

Compliance with environmental legislation

In 2021, there was a failure to install sufficient gas detection equipment at Kao Huludao Casting Materials Co., Ltd. (fine of 542,000 yen), a failure to report the designated manager (fine of 1,444,000 yen) at the same company, and an exceedance of hydrogen sulfide limits at Kao USA Inc. (fine of 1,192,000 yen).

There were no deviations from environmental laws and regulations in 2023.

Compliance status with environmental laws and regulations

Classification	Unit	2020	2021	2022	2023
Number of deviations ^{*1}	Cases	4	3	0	0
Of which, number of leaks	Cases	1	0	0	0
Total fines ^{*2}	1,000 yen	607	3,178	-	-
Of which, number of leaks	1,000 yen	460	0	-	-

*1 All incidents detected by authorities during the reporting period

*2 Fines paid during the reporting period

Main initiatives

Initiatives to prevent air pollution

Efforts at plants

Compliance with laws and regulations

The volume and density of pollutants emitted into the atmosphere are regulated by government agencies. We have established our own voluntary management criteria, which are even more rigorous than the statutory requirements, and we comply with these to monitor pollutants.

Using cleaner fossil fuels

As the burning of fossil fuels is accompanied by the emission of NOx, SOx, PM, etc., we use natural gas, which is a clean fossil fuel, at all plants outfitted with the necessary infrastructure. Our plants do not use any coal.

Reducing emissions of chemical substances subject to PRTR

We began activities in this area by setting a voluntary target for annual emissions of one ton or less for each substance from each plant in FY2000. We achieved this target in FY2002. Since then, we have continued to achieve this voluntary target, excluding leaks of chlorofluorocarbon and similar emissions.

Since the chemical substances subject to the PRTR Law were changed in April 2023, we have not been able to compile data on the volume of chemical substances handled, emissions, etc. for the full year of 2023. During the nine-month period from April to December, there were 130 target chemicals handled in quantities of one ton or more, with a total discharge to the atmosphere and public waters of 5.3 tons. In addition, we are voluntarily monitoring and controlling releases and transfers (in the same way as would be done for chemical substances subject to PRTR) of chemical

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substances that the Japan Chemical Industry Association has specified as being subject to voluntary surveys.

Reducing emissions of VOCs

Our production plants outside Japan include some plants where it has not been possible to monitor VOC emissions or where the emissions are relatively high. We are working to monitor and reduce VOC emissions at these plants.

Initiatives taken in relation to logistics

Smart Logistics in partnership with Lion Corporation

Participating in the Strategic Innovation Promotion Program (SIP) promoted by the Cabinet Office, we started two-way transportation and retail between Kao and Lion Corporation in October 2020. This new initiative will achieve shorter empty running distances for the trucks by comparison with conventional transportation and retail methods, and is expected to result in a 45% reduction in atmospheric pollutants emissions for both companies combined.

Initiatives taken in relation to our products

LUNAJET water-based pigment inkjet ink

Using the pigment nano-dispersion technology that we had previously developed, we successfully developed *LUNAJET*, the world's first water-based pigment inkjet ink, featuring a VOC-free design^{*1} which ensures that only very small quantities of VOCs are emitted during printing operations, thereby helping to prevent air pollution and also making a major contribution toward improving the working environment of printing workers. We also confirmed that this water-based pigment inkjet ink technology can be applied to water-based gravure-printing ink.

*1 VOC-free design: "VOC-free" is defined as emitting less than 700 ppmC (in carbon conversion terms) of VOC during the printing process.
VOC: General term for organic compounds that are volatile and become gaseous in the atmosphere. In Japan, VOC emissions are regulated by the revised Air Pollution Control Law.

Visco Top UT thickener for concrete spraying construction

We developed and then launched full-scale sales for *Visco Top UT* thickener, which significantly decreases dust generated when spraying concrete for mountain tunnel construction. *Visco Top UT* is able to substantially reduce the amount of dust generated even when using a powder accelerator, which tends to stimulate dust dispersion. With only half as much thickener as would be needed with a conventional dust reducer, the dust concentration level can be reduced to 2 mg/m³ or less (as recommended by the new dust guidelines that came into effect in April 2021). This is registered in NETIS^{*2}, the new technology provision system (Number: KT-200035-A) and is anticipated to be utilized in the various tunnel construction commissioned by national and local governments.

*2 NETIS: Database system operated with the objective of the Ministry of Land, Infrastructure, Transport and Tourism sharing and providing information on new technologies

Initiatives to prevent water pollution

Initiatives taken in relation to product development

In product development, we take into consideration the impact that wastewater after product use may have on the water environment. More specifically, we have investigated the biodegradability of raw materials that may be discharged into the environment and their impacts on common aquatic organisms using river water

and activated sludge used at wastewater treatment plants. Through this investigation, we are actively promoting the development and use of raw materials with reduced environmental impact. We also plan to use AI and other technologies to investigate chemical substances that are highly environmentally conscious.

Efforts at plants

Compliance with wastewater-related laws and regulations

The volume and/or density of pollutants discharged into rivers, the ocean and sewage systems are regulated by government agencies. We have installed wastewater treatment facilities at many of our plants, which are maintained at a high level and properly treat plant wastewater before being discharged outside the plant. We have established our own voluntary management criteria, which are even more rigorous than the statutory requirements, and we comply with these to monitor pollutants.

Surveys of groundwater and soil contamination

In light of our past history of chemical substance use, every year we voluntarily measure the level of substances regulated by environmental standards in the groundwater within plant premises.

Initiatives relating to wastewater after product use

We are focusing on understanding the actual situation in relation to wastewater discharge after product use and we are conducting our own field surveys on an ongoing basis, such as environmental monitoring of river water to get an idea of the ecological risks of chemical substances.

To respond to globalization, we collaborate with experts to verify the effectiveness of mathematical

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models and develop new models for monitoring environments outside Japan and predictions of chemical substance concentration in rivers, aiming to ensure our business activities are environmentally conscious of the local environment. Recently in Japan, we have been analyzing in detail the impact of chemical substances on the ecosystem using data gathered from ecological monitoring and the river environment.

We are also participating in environmental monitoring that has been undertaken by the Japan Soap and Detergent Association (JSDA) since 1998. Currently, we assess the environmental risks posed to the ecological system targeting four major surfactants in municipal rivers (measured four times a year at seven sites in four rivers). The results of the surveys conducted so far show that these surfactants have consistently low risks to aquatic organisms.

Initiatives taken in relation to our products

Visco Top high-performance specialty thickener

When undertaking civil engineering work near water (for example, on riverbanks or on the coast), it is vitally important that measures are taken to protect the water from being contaminated. In the case of bridge pier



Without the addition of *Visco Top*



With the addition of *Visco Top*

construction for long bridges or suspension bridges that cross ocean straits, because the piers are actually built in the river water or seawater, special underwater concrete that has high viscosity and is resistant to washout is used. Furthermore, when construction is undertaken near underground watercourses, care must be taken not to contaminate the groundwater. In this kind of water-related environment, thickening agents must be added to inorganic materials such as grouting materials and concrete to enhance water-immiscible properties.

We have developed *Visco Top*, a high-performance specialty thickener that provides unprecedented viscosity for grouting materials and concrete, and makes it possible to undertake construction work without polluting the riverine or ocean environment. *Visco Top* has also been used in the removal of high-concentration contaminated water from trenches at the Fukushima Daiichi Nuclear Power Plant.

Smash alkali-free professional-use detergent

Alkali detergent used for hard-to-remove kitchen stains must adjust (neutralize) its pH when the cleaning liquid is discharged to prevent water pollution, while mild cleansers without alkali generally do not have sufficient cleaning effects.

Smash, the newly debuted kitchen oil stain detergent, works safely with a neutral formula that has the same cleaning power as an alkali detergent, and contributes to preventing water pollution with its gentle ingredients



Smash kitchen oil stain detergent

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Employees' opinions

Actions for the reduction of Air pollution in KCSA



Veronica Estevez

Engineering & Maintenance
Engineering
Kao Corporation S.A. (Spain) (KCSA)

KCSA has several facilities in its chemical plants where the reduction and control of pollution are very important to achieve our goals of improving society, economy and the environment. Different projects have been carried out in from 2019 to 2023 to reduce air pollution in several processes.

- Reduction of VOCs: In the Olesa factory, to make the first step in starting reduction and control, there was a need to carry out a detailed study of all emissions sources while adjusting operation conditions to make improvements to depressurizing, vacuuming and condensation. Nevertheless, to reach the very low limits required by the government (20 ppm) it is

necessary to complement all these actions with special emissions treatment systems, using Regenerative Oxidation Plants or Thermal Oxidation plants featuring heat recovery systems with continuous monitoring for the government. With these facilities, we were able to reach values below 15 ppm.

- With a regenerative plant installed in 2019, we have reduced emissions of Aroma Plants (MDJ-1, Boisambrene and Ambroxan) by 99.3% and average emission values have been around 14 mgC/Nm³. This year, with the construction of the MDJ-2 Plant, H₂ and VOC emissions are connected to a new Thermal Oxidation plant with a steam boiler to recover heat from combustion gases. Through this, we have achieved a reduction of 99.99%, with emission values below 1 mgC/Nm³.
- Reduction of solid particles: At our factory in Santiga, the manufacturing of toner for printers generates solid particles of very small size, which results in a larger amount of generated dust, as well as greater internal and external air pollution. To reduce external

emissions from 240 mg/Nm³, it has been necessary to modify gas transport facilities to decrease gas velocity, as well as to improve filtration operation and cleaning. In addition, high efficiency filters have been installed at the outlets of existing filters. After executing all these improvements, we have achieved an emission value of 2.6 mg/Nm³, marking a reduction of 99%.

Several measures have been taken in order to improve the air conditions inside our Toner Factory and the health of our workers. We have been able to reduce internal emissions by modifying our filling stations with systems that perform better in the filling process and automatizing material recovery with automatic recirculation systems.

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Stakeholder engagement



Kenji Furukawa

Professor Emeritus,
Kumamoto University

Assessments of and expectations for Kao's initiatives on prevention of air and water pollution

Kao considers environmental conservation and human safety in its corporate activities, and is actively working to realize a society capable of sustainable development through providing products that have a small environmental impact. These efforts have led to high praise from the CDP, an environmental NGO, and Kao has established itself as a global frontrunner in terms of environmental consciousness. The following comments on Kao's efforts to prevent air and water pollution are based on its publicly available Sustainability Report and collection of environmental impact data.

1. Initiatives to prevent air pollution

Kao is working to reduce CO₂ emissions from its own business sites, aiming for carbon zero by 2040 and carbon negative by 2050. It is noteworthy that CO₂ emissions from domestic plants have decreased in many plants compared to last year. However, CO₂

emissions from plants depend on changes in production volume, production processes, and production items, so I would like to see a statement on this point. SO_x and NO_x emissions from the combustion of fossil fuels used are steady at the current level, perhaps due to limitations in the performance of exhaust-gas treatment equipment. In particular, the majority of NO_x emissions come from the Wakayama Plant and are in urgent need of reduction. I would like to see measures to diversify the fuels used in plants, including the use of solar power generation at plants using available spaces such as vacant lots, parking lots, and building walls, and the use of clean fuels such as green hydrogen and ammonia.

With regard to reducing CO₂, the CDP also calls for Scope 3 (downstream) reductions. Since Kao has concluded a logistics agreement with Lion and has begun pioneering efforts (smart logistics) aimed at improving truck transportation productivity and reducing CO₂ emissions, I look forward to the fruits of these efforts.

Kao voluntarily discloses emissions of volatile organic compounds (VOCs) from its domestic plants and dioxin emissions from waste incineration, which is commendable.

Kao operates 30 plants outside Japan. While the company is endeavoring to grasp the CO₂, SO_x, NO_x, and VOC emissions from these plants, there are still some plants that have yet to pin down their emissions. I hope that Kao will make diligent efforts to understand the situation and take proactive steps to reduce them.

2. Initiatives to prevent water pollution

COD emissions from Kao's wastewater treatment facilities at its domestic plants discharged into public waters are properly treated to low levels, with the exception of Kashima and Wakayama Plants and Kao Paper Manufacturing Fuji Co., Ltd. The Kashima and Wakayama Plants and Kao Paper Manufacturing Fuji Co., Ltd. use large amounts of water, so it is inevitable that their COD loadings are high, but the COD loadings at the Kawasaki and Odawara Plants, which also use large volumes of water, are not that high. Therefore, Kao needs to review COD emissions from the Kashima and Wakayama Plants, as well as at Kao Paper Manufacturing Fuji Co., Ltd., including the re-examination of wastewater treatment methods.

Both water use and COD emissions at plants outside Japan are either maintained at current levels or on a declining trend, but I would like Kao to pursue water conservation at plants with high water use.

3. Sludge volume reduction

Surplus sludge generated from wastewater treatment is mainly incinerated at Kao. However, incinerator operation not only requires auxiliary fuel, but also proper exhaust gas treatment.

If the amount of surplus sludge generated from wastewater treatment can be reduced, the cost of surplus sludge treatment (dewatering and incineration costs) can be significantly reduced. Kao plans to maintain a stable low BOD-SS load and thereby reduce surplus sludge generated by immobilizing activated sludge, which plays a major role in wastewater treatment, on carriers. Kao has

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completed a study of wastewater suitable for the treatment of activated sludge, with the aim of establishing a food chain in activated sludge that can support even *Tubifex*. I hope that a cost-effectiveness study will be conducted soon and that a wastewater treatment method that can reduce surplus sludge will be introduced as soon as possible.

4. Expectations for Kao

Summer 2023 was the hottest summer in recorded history. With the achievement of the “pursuit of efforts to limit the increase in global average temperature to 1.5 degrees Celsius” adopted at COP26 in extreme jeopardy, companies are required to promote decarbonization management more than ever before. As evidenced by the EU’s plan to introduce an international carbon tax starting in 2026, there is an urgent need for companies with global operations to carry out initiatives for decarbonization. Kao, which is highly regarded worldwide for its environmentally conscious corporate management, is expected to set an example for decarbonized management. I want Kao to promote sustainable ESG-driven management, which is a departure from ROE-driven management, more than ever before. Nevertheless, corporate management cannot stand still if products do not sell. I expect Kao to promote product development and marketing based on demographic composition and market needs, leading to sustainable ESG-driven management through the development of reliable products.