



Environment, Safety and Health Report 2002

– Kao's Responsible Care –



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Company Outline (as of March 31, 2002)

Corporate Name: Kao Corporation

Address: 14-10, Kayabacho 1-chome, Nihonbashi, Chuo-ku, Tokyo 103-8210 Japan

Consumer Information Center: 1-3, Bunka 2-chome, Sumida-ku, Tokyo 131-8501 Japan Tel: +81-3-5630-9911

<URL> : <http://www.kao.co.jp/e/>

Foundation: June 1887, Tokyo, Japan

Registration: May 1940, Tokyo, Japan

Capital: ¥85.4 billion

Number of Employees: 5,744

Description of Business: Manufacture, marketing and sale of consumer products, cosmetics, and chemical products. The major products are listed below:

- **Consumer products** Personal care products: soap, body care products, shampoo/conditioner, hair color
Laundry and cleaning products: laundry detergents, fabric softeners, dishwashing detergents, household cleaning detergents
Hygiene products: sanitary napkins, disposable diapers, incontinence products
Food products: healthy cooking oils, cooking oils, dressing, packaged cake mixes
- **Cosmetics** Facial cleansers, facial care, special care, makeup
- **Fatty chemicals and specialty chemicals** Fatty acids, fatty alcohols, fatty amines, concrete additives, de-inking agents

Kao operations in Japan

• Offices

Kayabacho Head Office (Chuo-ku, Tokyo), Osaka Office (Nishi-ku, Osaka-shi, Osaka)

Sumida Office (Sumida-ku, Tokyo)

• Plants

Sakata Plant (Sakata-shi, Yamagata), Kashima Plant (Kashima-gun, Ibaraki)

Tochigi Plant (Haga-gun, Tochigi), Tokyo Plant (Sumida-ku, Tokyo)

Kawasaki Plant (Kawasaki-shi, Kanagawa), Toyohashi Plant (Toyohashi-shi, Aichi)

Wakayama Plant (Wakayama-shi, Wakayama)

Ehime Sanitary Products Company, Limited (Saijo-shi, Ehime)

(Although Ehime Sanitary Products is not a part of Kao Corporation, it is regarded as Kao's plant in this report, because it produces Kao products only.)

• Research Laboratories

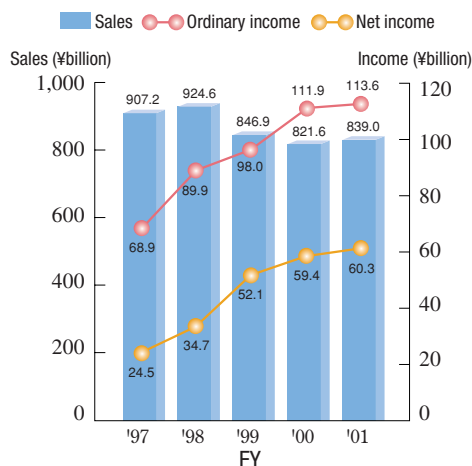
Tochigi Research Laboratories (Haga-gun, Tochigi)

Tokyo Research Laboratories (Sumida-ku, Tokyo)

Wakayama Research Laboratories (Wakayama-shi, Wakayama)

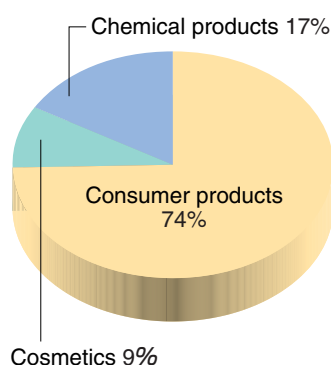
Sales and Income

Consolidated sales and income

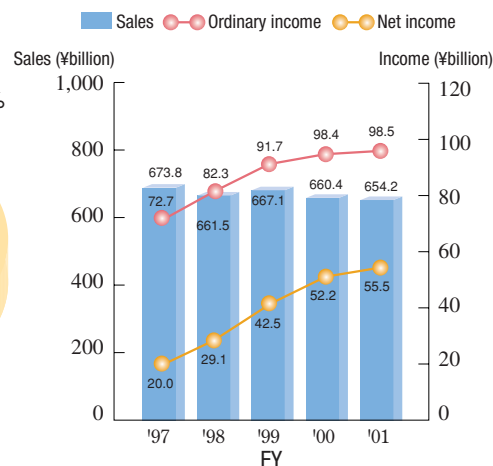


(67 subsidiaries consolidated, 8 companies applied equity methods)

Share of consolidated sales in FY 2001



Nonconsolidated sales and income



Aiming for a Sustainable Society

Over the past few years, whenever I read or hear the discussions among various countries about the Kyoto Protocol, I get a strong sense of how truly difficult it is to reach comprehensive agreements on environmental issues. Nevertheless, an objective look at such problems as global warming, the depletion of energy and other resources and the deterioration of water quality, leads us to recognize two indisputable facts: That our material prosperity has been earned at the expense of placing a heavy burden on the environment, and that as a result, human history has reached a momentous turning point. Although the search for long-range solutions and reaching agreements on the future shape of our interaction with the environment will take some time, it is important that we resolutely take the initiative and do whatever we are capable of doing as soon as we can.

At this stage, companies, administrative agencies, local governments, citizens and NGOs should continue to conduct their own independent activities, but they should also join hands whenever possible to tackle environmental issues. Companies that are key players in the market economy, particularly manufacturers such as Kao, must take the lead in this effort and set an example for others by reducing the burden that business activities place on the environment.

Japanese companies are currently faced with severe market conditions, and we cannot predict with certainty what changes will occur in the future. This makes drawing up a vision of the future very difficult. After achieving great business success on the wave of high economic growth, many Japanese companies are taking up the challenge of rapidly shifting their management paradigm to deal with global environmental problems. Management systems now have to pursue “sustainability,” the goal of achieving compatibility between economic development and environmental conservation. No matter how business conditions change in the future, attention to environmental issues will remain a central responsibility. Corporations must chart a course over long time frames stretching 10 to 20 years to ensure that their activities are in line with an agenda to achieve a sustainable society. Kao will continue to formulate and implement clear policies and action plans to contribute to the creation of a better global environment. This effort is positioned as a management task of utmost importance. On the basis of this resolve, as the President and CEO of Kao, I will try to provide leadership enabling the company to contribute to the building of a new, sustainable society that will guarantee succeeding generations the right to enjoy the blessings provided by the natural environment.

I hope this report will help you deepen your understanding of our environmental activities based on the philosophy described above.

August 2002



Takuya Goto

Takuya Goto
President and CEO

Kao's Approach to Environmental Responsibility

Kao Corporation positions environmental policy as an extremely important management issue. As a matter of course, we comply with various environmental protection regulations as required, and at the same time, we set our own targets to ensure that we are doing everything possible to reduce the burden our activities place on the environment. Here we will present a report on our approach to environmental issues in the past fiscal year, which ended March 31, 2002.

Kao's approach to environmental issues, which covers the full range of its business activities, has two main features.

Since the majority of our products are daily use consumer goods, their utilization generates waste material released into the environment. Much of the waste is disposed in sewage, while containers and packaging are generally discarded as domestic garbage. Aware that consumption of our products places a burden on the environment, we recognize that one of our most meaningful tasks is to develop products that have a minimal impact on the environment. This environmental policy guides our work through every stage of the product lifecycle — from procurement of raw materials, to production, distribution, consumption, and disposal.

The other main feature of our environmental policy is related to the fact that we are also a manufacturer of chemical products as well as daily use consumer products. Kao utilizes and produces a large number of chemicals. Here, we have adopted the philosophy and guidance of the Japan Responsible Care Council, of which we are a member, and we aggressively develop our own environmental conservation programs in such areas as energy savings. We also disclose full and accurate information in accordance with the Pollutant Release and Transfer Register (PRTR) law and strictly observe all other bylaws.

Furthermore, Kao makes an ongoing effort to reduce the environmental burdens resulting from all of its production activity — for all types of products. In the last fiscal year, we were able to make significant progress in the area of reducing resources and energy consumed in our production processes. This in turn enabled us to reduce CO₂ emissions.

In the field of environmental conservation, the company has stepped up efforts, including renewal of the Kao Website, to provide useful information to the public. This is based on our recognition that we must work in partnership with the government and consumers using our products if we are to make advances in environmental conservation.

While pursuing steady advances from these programs, the company will aggressively engage in such other activities as utilizing Life Cycle Assessment (LCA) and "green purchasing" plans. Through these efforts, we will weave environmental conservation into the fabric of our corporate mission which focuses on contributing to the enrichment of people's lives and creating innovative products of excellent value.

We hope that this report will enable you to understand Kao's environmental activities. Readers' frank opinions and suggestions on this subject are always more than welcome.

August 2002



Yasuo Idemitsu
Yasuo Idemitsu
Executive Vice President, Global Environment & Safety

Overview of Fiscal 2001 Environmental and Safety Activities

Kao's environmental and safety activities are based on the Kao Management Principles, which incorporate the company's core corporate activities, and in conformity with the philosophy of responsible care (RC) activities promoted by the Japan Responsible Care Council (JRCC). RC activities include "environmental conservation," "occupational safety and health," "process safety and disaster prevention," "safety management of chemical substances," and "communication."

(1) Environmental Activities

① Management system:

The attainment of ISO 14001 certification for every domestic plant was completed in April 2001. The company will further improve each aspect of its environmental performance according to this standard management system. (See page 11 for more details.)

② Product development for reduction of the environmental burden

The company pursues greater concentration and compactness of products based on a belief that "reducing the use of raw materials" is the foundation of environmental measures. *Attack* laundry detergent is a representative product of the company. With its epoch-making cleaning power and its compact size – 1/4 that of conventional detergents – it created a market sensation at the time of its release in 1987. This is the kind of achievement that we are continually seeking to make. (See page 19 for details.)

③ Energy saving and reduction of CO₂ emission

While the unit indices of energy consumption and CO₂ emission steadily decreased for several years, absolute amounts increased. However, by changing the fuel at co-generation facilities from heavy oil to city gas (natural gas), promoting the reallocation of facilities, and improving energy saving and energy efficiency in each workplace, the company has achieved reduction in absolute values in fiscal 2001, following fiscal 2000. (See pages 20, 21 for details.)

④ Reduction of wastes

Approximately 45,000 tons of waste were discharged during the year. Of this figure, the final discharged was approximately 5,000 tons, an increase to 113% vs. the previous fiscal year. (See page 21 for details.)

In fiscal 2001, the company has made "project teams for reduction of waste" at each plant. Of the 3Rs activities, namely activities to Reduce, Reuse and Recycle, these teams focus in particular on efforts to Reduce, with an aim to achieve "zero emission" as early as possible.

⑤ PRTR

As for substances tentatively subject to the PRTR law as designated by the Japan Chemical Industry Association, the company has established the emission amount of a maximum of 1 ton per year as the target of each plant since 1999. The same target levels are applied to substances newly added by the PRTR law from fiscal 2001, and the strategies have been mostly mapped out. Emission of each substance is expected to be under 1 ton per year in fiscal 2002. (See page 25 for details.)

In recognition for its promotion of refill products, reduction of CO₂ emission, and proper control of chemical substances through these activities, the company was honored with the Fuji Sankei Group Award at the 11th Global Environment Award Ceremony.



(2) Occupational Safety and Health

In fiscal 2001, there were three accidents resulting in personnel leave in the Production & Engineering Division and Research & Development Division. This amounts to a frequency rate of 0.35, which is higher than the previous year's rate of 0.22. The rate for the overall chemical industry researched by the Ministry of Health, Labour and Welfare is 1.03. (See page 29 for details.)

Because of its proven effectiveness in the Logistics Division, the company applied "risk assessment related to machinery" to the production facilities. The "risk assessment related to operations" was implemented in order to reduce relatively minor accidents not resulting in personnel leave. The company has selected the model production line in each plant to thoroughly learn and apply methods to other facilities. This activity will be continued in fiscal 2002. (See page 29 for details.)

(3) Disaster Prevention Activities

There have been no major cases of fire or explosion in recent years. In November 2001, the Central Disaster Prevention Council's special earthquake research committee identified new possible earthquake centers in the Tokai district in Japan. Based on this information, the company forecasts potential risks and reviews building structures to prevent disasters. Aside from emergency drills at each workplace, the company provided corporate training on the assumed occurrence of a disastrous earthquake in the Tokai district. We will continue this kind of training in this fiscal year.

(4) Safety Management of Chemical Substances

The company revised the Kao Product and Material Safety Assessment Standards, self safety standards, to a large extent and issued the fourth edition. The new edition specifies test methods by product category and standards to estimate safety as well as materials prohibited or limited to use and standards to select materials. (See page 14 for details.)

The company has developed the master index (M. I.), a new chemical substance identifying code. The company is constructing a system to control safety information to identify the M. I. of all products from individual materials to final products. Operation of a new MSDS preparation system and safety database began from this year. (See page 26 for details.)

Under the PRTR law, from this year the company is obligated to declare some materials used for detergent (LAS-Na, AE, amine oxide, and DADMAC). Through participation in activities to assess risk concerning human health and environmental impact, the company publicized the results in a report issued by the Japan Soap and Detergent Association. (See page 15 for details.)

As for external activities concerning safety of chemical substances, the company also joins the safety inspection program for High Production Volume (HPV) chemicals and the Long-range Research Initiative (LRI). Specifically they are the HPV program at the International Consortium for inspection of fatty alcohol and n-alkylbenzenesulfonic acid and its salts, and LRI organized by the Japan Chemical Industry Association. (See page 27 for details.)

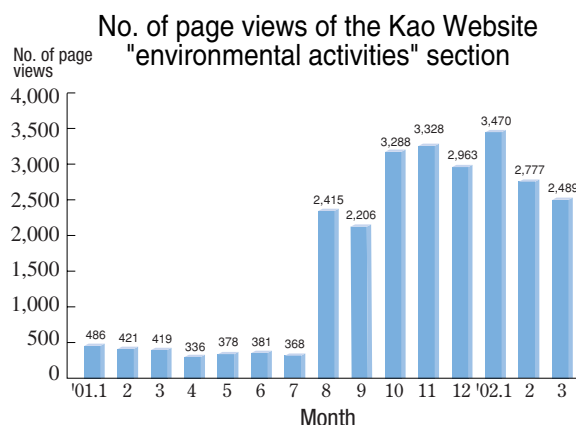
(5) Communication

The Kao Website section for environmental activities has been renewed for easier access, and new topics were added. As a result, the number of page views increased to approximately 10 times that of the previous year.

The company endeavors to communicate in an interactive way with consumers, local communities, and other stakeholders through cultural and artistic activity support and environmental volunteer activities. (See page 30 for details.)

We will continue our efforts to find the optimal form of communication through a variety of activities.

Kao issued 7,000 Japanese language copies and 1,700 English language copies of the Environment, Safety and Health Report 2001.



Overview of this Year's Report

In 1998, Kao Corporation issued "Kao's Responsible Care," the first edition of its annual environmental and safety report. We have published it in its current revised form, with its present title and range of subjects since 2000.

This report, the third edition since adoption of the current format in 2000, covers the business period and fields of activity indicated below.

•**Fiscal year covered:** Fiscal 2001 (from April 1, 2001 to March 31, 2002)

•**Workplaces covered:** Places of business in Japan included in the company outline.

•**Scope of activities covered:** The report covers environmental and safety and disaster prevention efforts concerning business locations and activities included in the company outline. (However, the Kayabacho Head Office and Osaka Office are not included in the reports on "1. Substance Flow on Business Activities" and "4. Production" in Chapter 2.)

•**Date of publication:** August 2002 (The next edition will be published in August 2003.)

•**Publishing department:** Environment and Safety Division, Kao Corporation

•**For further information please contact:** 2-1-3 Bunka, Sumida-ku, Tokyo, 131-8501; Tel: +81-3-5630-9089 Fax: +81-3-5630-9343.

While the subject contents covered in this report are basically the same as those in last year's report, we tried to give more complete information on the points discussed below.

(1) Kao's efforts in the areas of product safety and environmental risk

We provide more detail in this edition than we did in the 2001 edition on our approach to product safety, the methods we use to evaluate the safety of the products we sell, and the standards we use in the selection of raw materials. (See page 14 for details.) Also new in this edition is a discussion of Kao's international contributions in the area of product safety evaluations. (See page 27 for details.)

(2) Specific information pertaining to each plant

While we began providing environmental data pertaining to each of Kao's plants in last year's edition, for the first time, this year's report includes comments by managers of each plant about efforts being made at each site.

We have also added data on the quantity of emission of substances subject to the PRTR law. (See pages 34-41 for details.)

(3) Verifications by third parties

As we discuss elsewhere in this report, Kao's environmental and safety activities are in accordance with the philosophy of Responsible Care activities.

This report has been provisionally verified by a third party, the Japan Responsible Care Council (JRCC). The results of the verification as provided in evaluation and advisory reports from the JRCC are found on page 44, 45.

Environmental Accounting

Kao's environmental accounting began with compilation of the results for fiscal 1999; in fiscal 2001 we made the third compilation. For the past two years, the company followed the "Guideline for Introduction of the Environmental Accounting System (2000 edition)" issued by the Ministry of the Environment. In March 2002, the Ministry newly issued the "Environmental Accounting Guidebook II (2002 edition)," so the company changed a portion of its compilation method, i.e. categories of costs, for fiscal 2001.

(1) Compilation method for fiscal 2001

- ① Complies with the "Environmental Accounting Guidebook II" issued by the Ministry of Environment.
- ② Compiles costs for environmental conservation activities (including depreciation allowance), investment and effect.
- ③ Calculates the overall effect of the environmental conservation effects (physical unit) and economic effects (currency unit).
- ④ Does not include deemed effects such as aversion to risk.
- ⑤ Covers Kao Corporation and 4 Subsidiaries in Japan for the period between April 1, 2001 to March 31, 2002.

(2) Results for fiscal 2001

① Environmental conservation costs

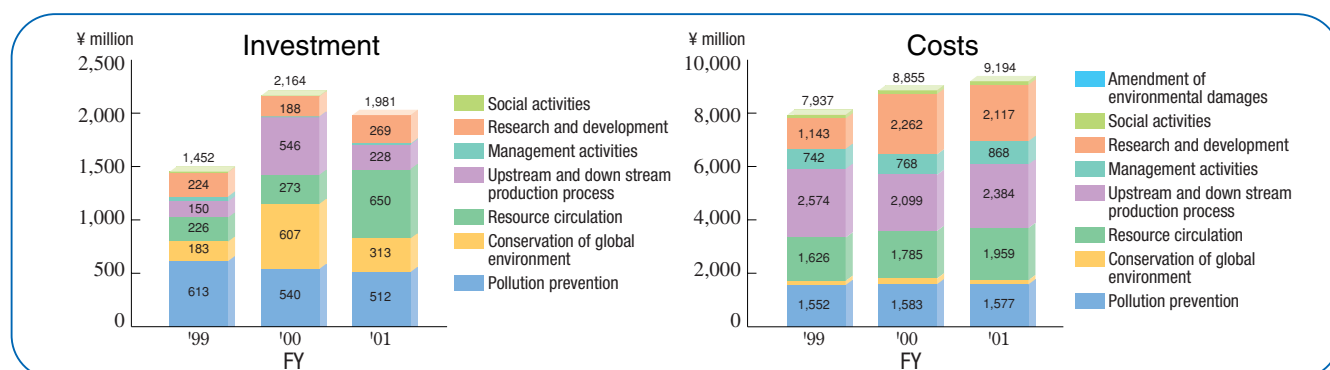
Environmental conservation costs			(Unit: ¥million)
Category	Main activities	Investment	Cost *1
Costs by business area		1,475	3,691
Breakdown	① Pollution prevention	512	1,577
	② Conservation of the global environment	313	155
	③ Resource circulation	650	1,959
Costs incurred during upstream and low-stream production process	Product recycling, packaging recycling and the manufacture of products in an environmentally responsible manner	228	2,384
Costs of management activities	Obtainment and maintenance of ISO, disclosure of environmental information, compliance with PRTR law, education	10	868
Costs of research and development	Development of products in an environmentally responsible manner	269	2,117
Costs of social activities	Nature conservation in areas around plants, beautification activities, donations, supporting funds	0	135
Costs of amendment of environment damages			0
Total		1,981	9,194

*1: These costs include depreciation allowances.

- The total investment was ¥1.98 billion, of which the primary investment involved new facility with incinerator for waste disposal in the Kawasaki Plant, new private power generation facility in the Sakata Plant, and a pilot plant to research the efficient usage of resources in the manufacturing process of functional fine particles.
- The total cost was ¥9.19 billion, with major expenses being labor costs for research and development, consignment costs for waste disposal, and depreciation of production facilities to produce products developed in an environmentally responsible manner and consignment costs for recycling products in compliance with the Containers and Packaging Recycling Law.

● Trends in environmental conservation costs

The company has introduced environmental accounting since fiscal 1999. Trends in environmental conservation costs for the three years are shown in the graphs below.



- Although investment in fiscal 1999 was made mainly to prevent pollution (to reduce emission of substances subject to the PRTR law), investment subjects were shifted to conservation of the global environment (energy conservation) and upstream and down stream production process (production facilities to produce refill products) in fiscal 2000, and resource circulation (conservation of resources, processing of waste) in fiscal 2001. (See page 20 for specific trends in past investment.)
- Costs are increasing slightly year by year. This is attributed to increase in the number of research and development personnel in fiscal 2000, and increase in costs for resource circulation (processing of disposal) and costs for upstream and down stream production process (consignment costs for recycling products in compliance with the Containers & Packaging Recycling Law) in fiscal 2001. The said consignment costs for recycling products are forecast to increase in the following years.

② Environmental conservation effects

Environmental conservation effects (physical unit)				
Items	Contents	Unit	Increase/decrease *3	
			vs. FY2000	Vs. FY1990
Resources used in business activities	Energy consumed (crude oil equivalent)	1,000 KL L/¥million *2	▲ 5 ▲ 7	▲ 3 ▲ 152
	Plastics used for packaging	tons kg/¥million *2	▲ 1,100 ▲ 2	
Environmental burden and waste discharged from business activities	CO ₂ emission	1,000 tons kg/¥million *2	▲ 15 ▲ 24	▲ 33 ▲ 443
	Waste discharged	1,000 tons kg/¥million *2	+15 +32	+19 +26
	Final disposal of waste	1,000 tons kg/¥million *2	+1 +1	▲ 15 ▲ 47
	SO _x emission	tons kg/¥million *2	▲ 21 ▲ 0	▲ 32 ▲ 0
	NO _x emission	tons kg/¥million *2	▲ 27 ▲ 0	+182 ▲ 0
	COD emission	tons kg/¥million *2	▲ 13 ▲ 0	▲ 2 ▲ 0

* 2: The amount of value added production output per ¥million. Value added production output is selling price-based production output, excluding variable production costs.

* 3: + means increase, ▲ means decrease.

- Environmental conservation effects are expressed by increase/decrease in absolute amounts as well as value added unit index. Increase/decrease values are indicated in comparison with values in the previous year (FY2000) and FY1990, the first year the company implemented full-fledged environmental measures.
- Although energy consumed and CO₂ emission decreased, waste generated and final disposal of waste increased this fiscal year in comparison with the previous fiscal year.
- Plastics used for packaging are specified in Chapter 2, and the others are detailed in Chapter 3.

Economic effects (Currency unit)			(Unit: ¥million)
Contents		Amount *4	
Income based on actual effects	Proceeds from sales of items with value	252	
Cost reduction based on actual effects	Cost reduction through energy conservation	191	
	Cost reduction through resource saving	1,161	
	Cost reduction of plastic through product development in an environmentally responsible manner	105	
	Expenses reduction (facility maintenance for environmental measures)	92	
Total		1,801	

* 4: The amount is the total reduction of costs of items that occurred in the reference year.

- The economic effects are calculated only in terms of direct cost reductions and sales of items with value. In other words, economic effects or deemed effects based on the assumption of evading risk are not included.
- Energy savings include cost reduction for fuel and electricity, while resource savings include expense reduction achieved by reducing obsolescence of raw materials as well as the amount of materials used.
- Cost reductions for plastics resulting from products developed in an environmentally responsible manner are converted to monetary value by using the difference in the volume of plastics used for containers and refill pouch products as compared with for containers only.

Chapter 1

Management

1 Philosophy and Policies Regarding the Environment, Safety and Health

Kao's philosophy and policies regarding the environment, safety and health were established in 1995 to define the company's activities concerning the environment, safety and health in accordance with the spirit expressed in the Kao Management Principles. Aware of the differences between environmental activities and safety and health efforts, Kao conducts activities within the frameworks of "Environmental Conservation," "Process Safety and Disaster Prevention," "Occupational Safety and Health" and "Chemical and Product Safety," as outlined by the Japan Responsible Care Council (JRCC). For this edition, the company reviewed the policies and added items concerning compliance with independently developed code, adequate training, and proactive disclosure.

Kao Management Principles

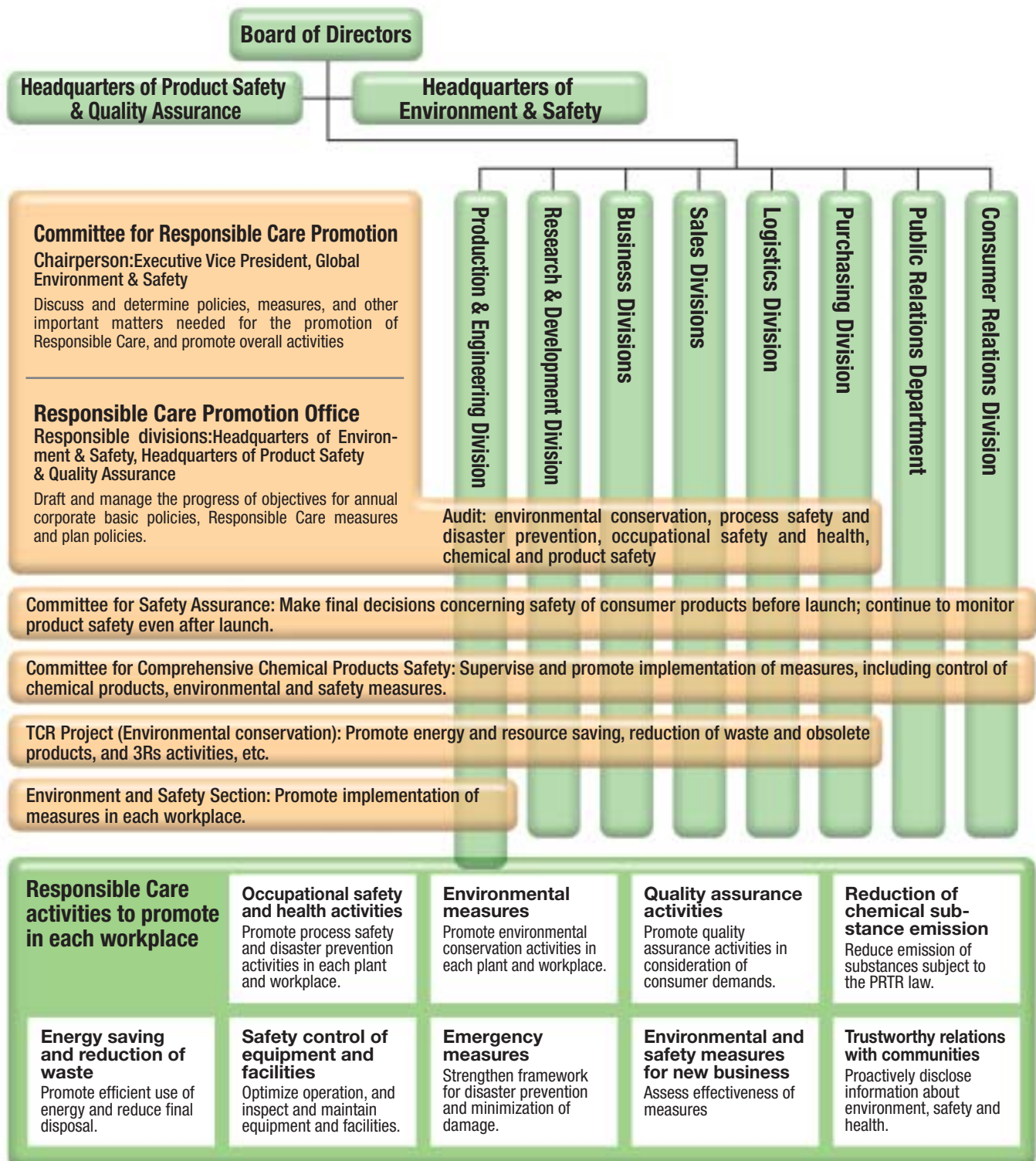


Policies Regarding the Environment, Safety and Health

- 1. Maintain employees' health and safety and improve operational safety**
Improve the work environment so that employees can work in health and safety; maintain safe operation; provide regular training to employees for security and in preparation for emergencies.
- 2. Develop products with attention to the environment and safety**
Assess environmental and safety aspects throughout the entire lifecycle of the products, from manufacture through disposal, when developing products and technologies; provide products that have a lower environmental burden and ensure safe use for consumers; provide appropriate information, i.e. proper use instructions, caution.
- 3. Save resources and energy, and reduce waste**
To protect the global environment, develop technologies in the product design stage in consideration of energy and resource saving and reduction of waste; raise productivity in terms of resources and energy; reduce waste and byproducts; reuse and recycle resources and energy.
- 4. Ensure safety of people in communities and take responsible approach to environmental conservation**
Proactively implement environmental measures as a member of a community to improve safety for people in the community and conserve the environment; responsibly and swiftly solve problems that adversely influence on the environment and safety.
- 5. Comply with laws and self-regulation**
Comply with relevant laws and bylaws in all business activities; set and follow company's own code of behavior.
- 6. Provide adequate training**
Consistently promote environmental and safety training to employees; raise each individual's awareness of responsibility, from management to employees.
- 7. Conduct self evaluation**
Conduct regular audit and self evaluation to continuously improve activities in the PDCA cycle.
- 8. Disclose information and improve credibility in the community**
Proactively disclose environmental and safety policies and data; improve credibility in the community through open, two-way communication.

2 Organization and Framework

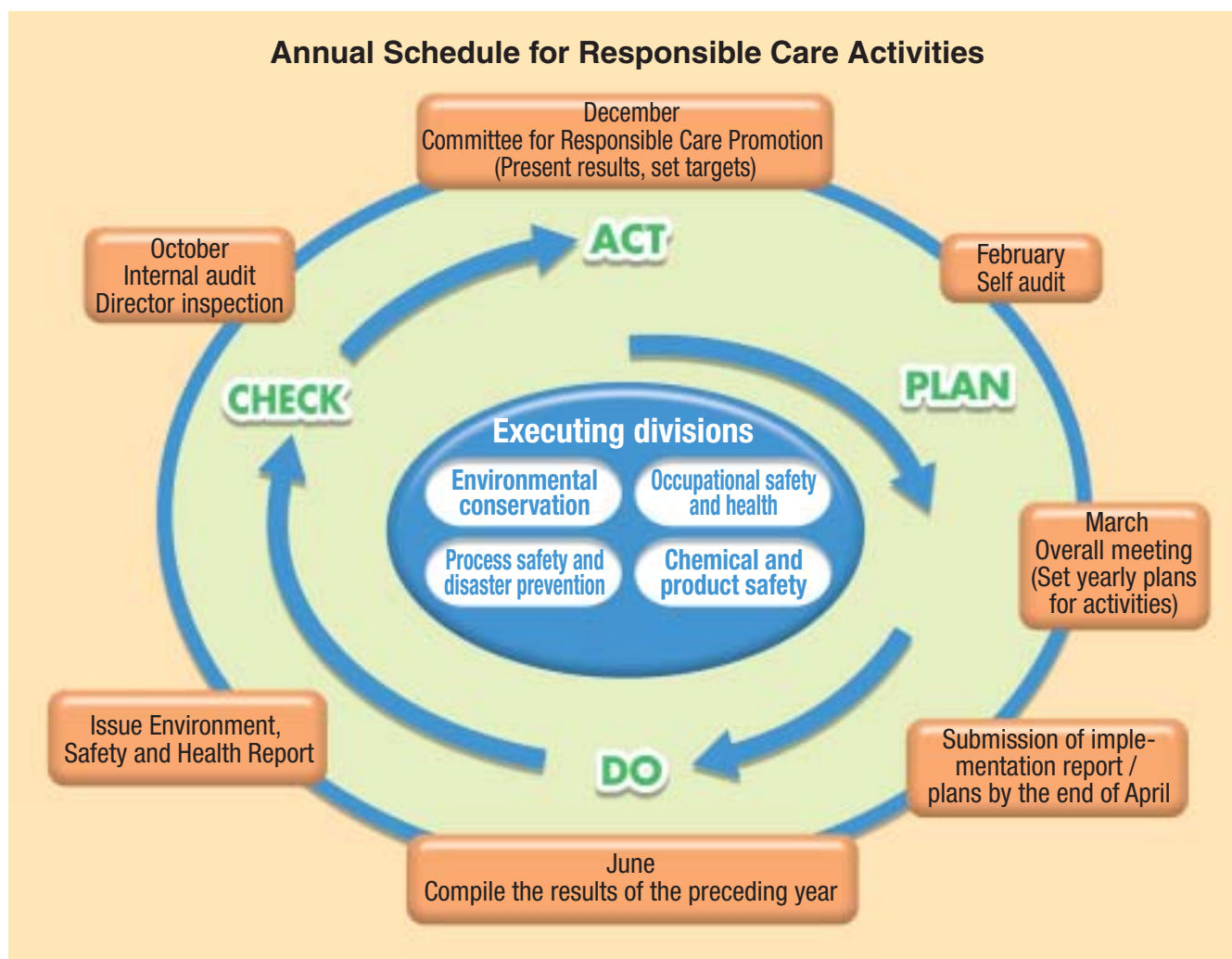
Fundamentally, each division, such as the Research & Development Division and the Production & Engineering Division, is responsible for the company's environmental and safety activities. However, organizations across divisions, i.e. the “Committee for Responsible Care Promotion,” or the “TCR Project,” promote and check specific activities in accordance with each organizational mission and annual schedule.



3 Operation and Audit

Responsible care activities are conducted according to a set annual schedule. At a session held in March, each division presents its issues and targets for the coming fiscal year to gain approval by top management. This is referred to as the “Plan” phase. The “Do” phase commences in April in conjunction with the start of the fiscal year. After activities have been conducted for a half-year, the Responsible Care Promotion Office carries out the “Check” phase around October by checking every plant and workplace. Then in the latter half of the fiscal year, each division corrects any problems specified.

The Responsible Care Promotion Office identifies the progress and issues of each division found in the October “Check” phase and summarizes corporate objectives. Management reviews these to make them the following fiscal year's themes or objectives. This step is referred to as the “Act” phase. At the Committee for Responsible Care Promotion meeting held in December, the following year's policies or targets are determined for communication to each division. By the end of February, each division independently audits achievement of the promotion plan and develops promotion targets to be approved in March. The following is the annual schedule that targets this PDCA cycle to improve activities each and every year in an upward spiral manner.



4 Response to International Standards (ISO)

The company has promoted attainment of the ISO14000 series, an international standard for environmental management systems, and the ISO9000 series, an international standard for quality management systems.

The present status of ISO certification is as indicated in the table. All business locations with plants in Japan achieved ISO 14001 certification by April 2001, and all plants attained ISO9000 series certification by November 2001.

The company is steadily adding ISO 9002 certification to currently held ISO 9001 certification for each subject product and Business Division.

Status of ISO attainment (as of April 2002)

◆ ISO14001 (Date of attainment)

- Kashima Plant December 1998
- Tochigi Plant/Research Laboratories October 1999
- Ehime Sanitary Products December 1999
- Wakayama Plant/Research Laboratories February 2000
- Sumida Complex April 2000
- Toyohashi Plant December 2000
- Kawasaki Plant March 2001
- Sakata Plant April 2001

◆ ISO 9001 (Date of attainment)

- Kawasaki Plant September 2001
- Sumida Complex, Cosmetics Business November 2001
- Tochigi Plant November 2001
- Toyohashi Plant November 2001
- Sakata Plant April 2002

◆ ISO 9002 (Date of attainment)

- Ehime Sanitary Products September 1999
- Kashima Plant Chemical Products and Food Production Center June 2000
- Wakayama Plant Laundry & Cleaning Products February 2000
- Chemical Products and Food Production Center May 1997

5 Education

The company is educating employees and staff of cooperating companies about the environment, safety and health in line with this ISO management system and responsible care activities. As a consequence, their awareness concerning the environment, safety and health has steadily risen.

The Production & Engineering Division has incorporated and practiced environmental and safety education in its curricula for wide-area training, i.e. Production Manager Training, the Kao Techno-School, and the Engineer-juku training school. 175 employees received this education in fiscal 2001. A total of 737 students took courses in the past five years, which means approximately 150 employees per year are educated in our system.

In addition, each workplace has been conducting education to promote the ISO 14001 management system. There are three kinds of educational courses in this field: an internal auditor training course led by internal instructors, and a basic course and internal auditor training course taught by external instructors. In fiscal 2001, 59 people took internal auditor training courses taught by external instructors, and a total of 299 people were awarded certificates issued by external institutions.

In another effort, our Consumer Information Center provided courses concerning Kao's environmental activities to approximately 73 consumers. These courses were given using corporate in-house materials, the Kao Environment, Safety and Health Report, the Environment and Safety Daily Life information booklet, the Environmental Measures in Daily Life video, materials from the internet, and other sources.

Chapter 2

Environmental Conservation Activities

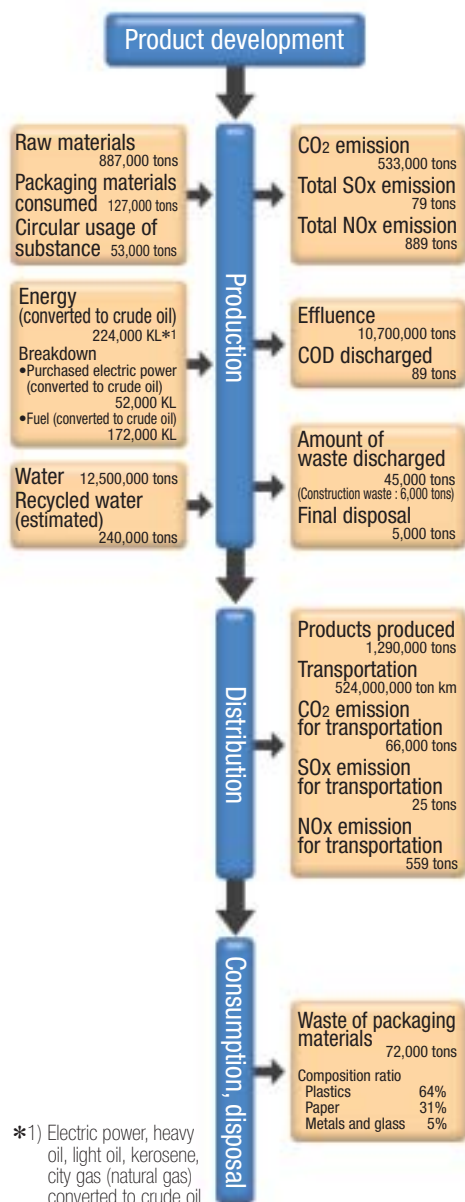
1 Substance Flow in Business Activities

Substance flow in Kao's business activities in fiscal 2001 is indicated in the table below. The volume of substance consumed was less than that of the previous fiscal year. Noteworthy in fiscal 2001 was the fact that the volume of CO₂ emissions, which contribute to the greenhouse effect, was reduced by 15,000 tons from the previous fiscal year, to a level 5.8% below that of fiscal 1990. The primary factors contributing to this result were the company's program to promote the introduction of cogeneration of energy, to shift to the use of city gas (natural gas) as a fuel, and other ongoing measures to save energy.

However, the activity required to improve some of our products led to new generation of waste, and the quantity of discharged waste increased. As a countermeasure, at the end of 2001, Kao installed new equipment for waste disposal at its plants. As a result, the quantity of waste generated has now gone back to the level of 2000. Nevertheless, for the reason mentioned above, the volume of final waste disposed, which is an important measure or target used in the effort to reduce the burden placed on the environment, increased by 560 tons year-on-year in fiscal 2001.

Kao uses Life Cycle Assessment (LCA) to analyze overall corporate business activities in terms of annual substance flow resulting from business activities. We will continue our efforts to effectively utilize input materials and to reduce output materials that exert an impact on the environment.

Substance flow in business activities
(Fiscal 2001)



Meanings and Definitions of Each Indicator of Substance Flow in Business Activities

Raw materials	Volumes of raw materials directly used for product manufacturing (excluding materials for containers, packages, fuels, etc.)
Packaging materials consumed	Total volume of materials used for containers, packages and cardboard boxes used for the company's products
Volume of recycled materials used	The volume of waste generated by production activities and recycled by the company
Energy (purchased electric power)	The amount of electric power consumed in production (excluding that consumed in administrative work and R & D activities)
Energy (fuel)	The volume of fuels consumed in production (excluding that consumed in administrative work and R & D activities, and heat recovered as a result of thermal recycling)
Recycled water	The volume of recycled water used as part of the company's total water utilization
CO ₂ emission	Volume of CO ₂ emitted in business activities
NO _x emission	Volume of NO _x emitted from facilities generating smoke and soot
Effluence	Total volume of effluence discharged by production facilities
COD discharged	Volume of chemical oxygen demand (COD) discharge calculated by multiplying effluence volume by COD density
Amount of waste discharged	Within volume of waste discharged in production, volumes that are sold or consigned for disposal as waste or recyclable resources
Transportation	Estimated volume of products delivered to distribution centers (includes products shipped directly to retail stores)
Waste of packaging materials	Volume of containers, packaging materials used for products sold

2 Creating Products Developed in an Environmentally Responsible Manner

Kao conducts activities in accordance with the philosophy of Responsible Care. The aim is to independently manage the entire life cycle of a product from development through disposal in terms of the environment and safety. The majority of Kao's products are disposed of, through a process of product development, production, distribution, and consumption, as waste or effluence generated by households at the final stage. Consequently we focus on the aspects at each stage, as shown below, to continuously produce products developed in an environmentally responsible manner.

• Product development and technological development

The company designs products that reduce the burden on the environment as much as possible, and ensures that products are safe for both people and the environment. Basic principles have been established to reduce the environmental burden. These are known as the “3 Rs” – Reduce, Reuse, and Recycle. Based on the principles, the company proceeds with product development in accordance with the specific policies given below.

- ① Reduce: Promote greater concentration and compacting of products.
- ② Reuse: Design packaging for reuse to conserve resources and for easy use.
- ③ Recycle: Proactively use recycled paper and recycled resinous materials as recycling measures.
- ④ Develop technology to reduce the environmental burden: Contribute to the reduction of industry's burden on the environment.

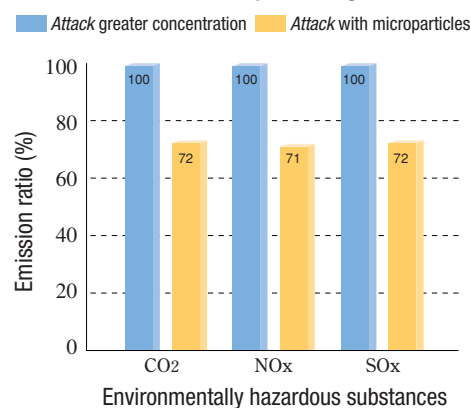
As a new project, we studied the environmental impact of laundry detergent based on the Life Cycle Assessment (LCA*) by comparing Kao's laundry detergent, *Attack*, first launched in 1995, and *Attack* with microparticles, which was relaunched in 2001. The results are as shown in the graph to the right.

The improvement in *Attack* contributed to enhanced performance as well as in reduction of the environmental burden in production activities. This approach will be applied to other key products of the company, including shampoo and conditioner, to establish a specific environmental assessment index based on LCA.

• Production

Although a mission of the Production & Engineering Division is to produce superior products at lower cost, for commercialization of products, we thoroughly consider aspects concerning product design and product research as well as energy and resource conservation, occupational safety and health, and disaster prevention in plants. Kao makes efforts to conserve energy and reduce CO₂ emissions by introducing co-generation facilities where electric power is self-generated through use of city gas. We also minimize discharge of water and air pollution, and substances subject to the PRTR law. The company actively promotes recycling and waste reduction as well to achieve zero emission.

Comparison of environmental burden loaded by *Attack* laundry detergent



* Life Cycle Assessment (LCA): Method to comprehensively analyze and assess the environmental burden during the entire life cycle of products, i.e. procurement of resources, production, consumption, and disposal. Using this method, we specify the input of raw materials and energy, as well as output of harmful substances and waste. This also enables assessment about what kind of environmental impact are loaded.

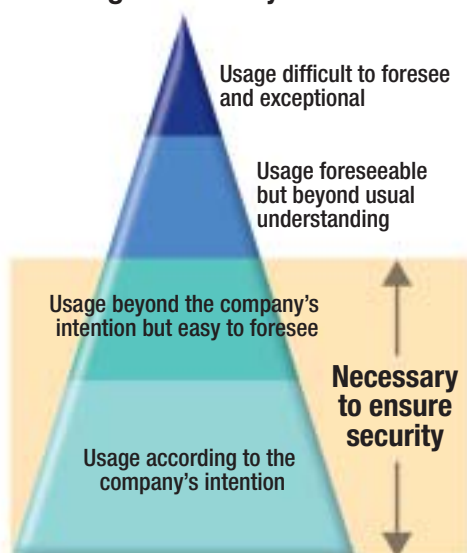
• Distribution

Through improvement in product performance and promotion of concentration and compacting of products, Kao contributed to not only reduction of raw materials used but also to energy saving in production activities. Also in terms of distribution, we contributed to a reduction in energy consumed for transportation and space used for storage.

Over the past several years, the company has optimized sales volume, production and shipping through the implementation of Supply Chain Management (SCM) to result in a reduction of excess inventory. (See page 24 for details.) In terms of transportation, we made efforts to improve efficiency by using larger vehicles and promoted joint delivery with other companies for load efficiency.

3 Product Development and Technological Development

Scope of responsibility for product usage and safety assurance



(1) Confirmation of Human and Environmental Safety

The company assesses the safety of products with regard to their impact on human health and the environment beginning in the product development stage. We have established the “Kao Standards for Product and Raw Material Safety Assessment” as our guidelines for product development to indicate our approach to safety assessment and standards for selecting raw materials.

① Basic approach to safety assessment

- Assess and ensure the safety of both raw materials (constituents compounded) and final products.
- Assure safety for human health and the environment in ordinary use conditions as well as foreseeable misuse of products.
- Follow approach to risk assessment. In other words, the company identifies the ordinary usage and use amount of products to study the impact level or hazard*¹ of products to human health and the environment. Then we assess the risk*² of the products and determine whether such risk is acceptable for human health and the environment.

* 1 Hazard: Potentially hazardous level of product with negative impact

* 2 Risk: Rate at which hazardous impact manifests

② Raw materials selection standard

The company independently limits use of certain raw materials besides use of chemical substances regulated by law. With regard to the manufacture of consumer products, the “Kao Standards for Product and Material Safety Assessment” specifies 13 prohibited substances and 68 limited-use substances. Kao also targets reduction of emission from 479 substances subject to the Responsible Care activities for industrial chemical products to lessen the environmental burden. The breakdown is as follows: 354 class I chemicals subject to the PRTR law; 55 substances whose use as raw materials constituting products is prohibited in principle; 70 substances whose use in products or in the manufacturing process is subject to conditions.

③ Safety assessment procedure

Safety assessment of consumer products and chemical products are conducted in the following procedures:

Consumer products:

- After confirming that the product's components match company standards (the primary screening), we classify the products into four categories to assess the safety, based on whether or not they contain new raw materials, previous use, and other factors.
- After conducting a second screening based on safety tests of materials and products in a laboratory, field testing is conducted at a practical level, and the risk is assessed.
- The final judgment of product safety is made following review in a Committee for Safety Assurance. Safety is tracked even after products are released (voluntary post marketing survey), and safety is reassessed, as necessary. Representatives of the Consumer Information Center, Research & Development Division, and Product Safety & Quality Assurance Division are regular members of the Committee.

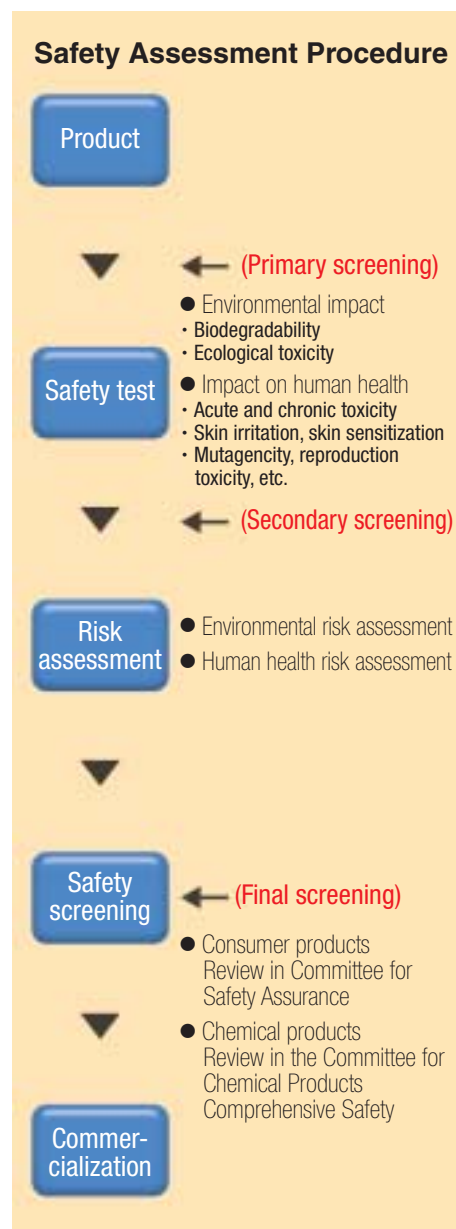
Chemical products

- After the safety assessment and check for compliance with laws and regulations, the Committee for Chemical Products Comprehensive Safety conducts the final safety confirmation for the product. This Committee is composed of representatives from the Administration & Accounting Department, Planning Department, and International Chemical Department in the Chemical Business Division as well as Affiliates.

④ Risk assessment of 4 kinds of Class I chemicals subject to the PRTR law

The PRTR law went into effect in April 2001, and some surfactants are designated as first class chemical substances. The Japan Soap and Detergent Association assessed the risk of four kinds of surfactants designated as class I chemicals used in Kao's consumer products to human health and the environment. The surfactants assessed are n-alkylbenzenesulfonic acid and its salts, poly (oxyethylene) alkyl ether, bis (hydrogenated tallow) dimethylammonium chloride, and N,N-dimethyldodecylamine N-oxide.

The company proactively joined the assessment program as a member of the Association and confirmed that the four kinds of surfactants did not pose a risk to human health and the environment. In autumn 2001, the Association published the results in a report concerning risk assessment of the impact of surfactants on human health and the environment. (The report is currently available only in Japanese.)



(2) Activities for 3Rs (Reduce, Reuse, Recycle)

Kao's environmental activities concerning product development and technological development are based on the 3Rs – reduction of raw materials, reuse of containers and their functional parts, and use of recycled materials. Further, Kao promotes concentration and compacting of products as well as use of refill/replacement products.

Compact-type products

(as of March 2002)

Classification	Product names
Powder laundry detergent (3)	<i>Attack</i> , <i>Attack Sheet-type</i> , <i>New Beads</i>
Liquid laundry detergent (2)	<i>Attack liquid</i> , <i>Emal delicate wash</i>
Fabric softener (3)	<i>Humming 1/3</i> , <i>Humming 1/3 – floral</i> , <i>Humming 1/3 – anti-bacterial Plus</i>
Laundry bleach (1)	<i>Haiteer 1/2 for colors</i>
Dishwashing detergent (5)	<i>Family herbal scent – concentrated</i> , <i>Family concentrated</i> , <i>Family mild-type</i> , <i>More easy for hands – concentrated</i> , <i>Family Power Gel</i>

The numbers in parenthesis are the number of compact-type items.

① Concentration and compacting of products

The below table shows 14 compact-type products available in the market as of March 2002. The percentage of compact-type products on a unit base in fiscal 2001 achieved 100% for both powder and liquid laundry detergents, 83% for fabric softeners, and 89% for dishwashing detergents.

② Refill/replacement products

The company proactively launches refill/replacement products to promote reuse of product containers and functional parts. As of March 2002, 66 refill products and 15 replacement products are available.

Refill products (as of March 2002)

Classification	Product names
Laundry detergent (3)	<i>Attack liquid</i> , <i>Attack spot cleaner</i> , <i>Emal delicate wash</i>
Fabric softener (3)	<i>Humming 1/3</i> , <i>Humming 1/3 – floral</i> , <i>Humming 1/3 – anti-bacterial Plus</i>
Laundry bleach (3)	<i>Haiteer wide</i> , <i>Haiteer for colors</i> , <i>Haiteer 1/2 for colors</i>
Starch (3)	<i>Smoother</i> , <i>Keeping</i> , <i>Keeping for washing machine</i>
Dishwashing detergent (6)	<i>Family herbal scent – concentrated</i> , <i>Family concentrated</i> , <i>Family</i> , <i>More easy for hands – concentrated</i> , <i>Family mild</i> , <i>Family Power Gel</i>
Household cleaner (6)	<i>Family sink cleaner</i> , <i>Mypet handy-spray</i> , <i>Mypet glass cleaner-liquid type</i> , <i>Magiclean multi-purpose</i> , <i>Magiclean bath cleaner-foaming spray</i> , <i>Magiclean deodorizing toilet cleaner</i>
Kitchen/household paper products (3)	<i>Quickle kitchen wipes</i> , <i>Quickle wipes for gas oven</i> , <i>Quickle toilet wipes</i>
Deodorizer (1)	<i>WILL deodorizing mist for fabric</i>
Pet care (1)	<i>Kao Pet Care wet tissues</i>
Body cleanser (6)	<i>Bioré U powder-in</i> , <i>Bioré U (4)</i> , <i>Bioré U cream-in</i>
Shampoo/conditioner (5)	<i>Merit shampoo</i> , <i>Merit conditioner</i> , <i>Merit two-in-one shampoo</i> , <i>Essential damage care shampoo</i> , <i>Essential damage care conditioner</i>
Facial care sheets (2)	<i>Bioré make-up remover – cotton wipes</i> , <i>Bioré eye make-up remover</i>
Body care sheets (4)	<i>Bioré deodorant powder sheets (3)</i> , <i>Bioré for men deodorant powder sheets</i>
Hair styling agents (7)	<i>Success morning hair water – gel water</i> , <i>Success morning hair water – hair smoothing mist</i> , <i>Lavenus hair water</i> , <i>Liese water supply mint shower</i> , <i>Liese speedy straight foam</i> , <i>Liese speedy perm-emphasizing foam</i> , <i>Liese speedy moisturizing foam</i>
Bottom wipes (3)	<i>Merries cotton-touch bottom wipes</i> , <i>Merries toilet disposable bottom wipes</i> , <i>Relief toilet-disposable wipes</i>
Hygienic care (1)	<i>Sanina toilet paper</i>
Cosmetics (9)	<i>Sofina fine fit refill</i> , <i>Sofina fine fit face powder refill</i> , <i>Sofina fine fit complete coverage type refill</i> , <i>Raycious powder makeup refill</i> , <i>Raycious lucent powder refill</i> , <i>Grace Sofina foundation refill</i> , <i>est the powder makeup refill</i> , <i>Aube eyeliner pencil cartridge</i> , <i>Aube eyebrow pencil</i>

The figures in parenthesis indicate the number of items.

Replacement products (as of March 2002)

Classification	Product names
Household cleaner (4)	<i>Haiteer mildew remover</i> , <i>Haiteer mildew remover strong</i> , <i>Magiclean handy spray</i> , <i>Mypet for shine</i>
Kitchen bleach (1)	<i>Haiteer foam</i>
Slime remover (1)	<i>Kitchen Wonder drain slime remover</i>
Car care (2)	<i>Vega car cleaner</i> , <i>Vega intensive wax</i>
Toilet aromatic deodorizer (3)	<i>Refre plug-in type (3 fragrances)</i>
Hair color (3)	<i>Blauné semi-permanent hair color</i> , <i>Blauné semi-permanent hair color for gray hair</i> , <i>Blauné men's semi-permanent hair color</i>
Hygienic care (1)	<i>Sanina</i>

The figures in parenthesis indicate the number of items.

• Conversion rate to refill/replacement products

Trends in the conversion rate from products sold in conventional containers to refill/replacement products are shown in the graph to the right. The average conversion rate for fiscal 2001 reached 81%. In particular, the conversion rates of fabric softener and liquid laundry detergent exceeded 90%, and rates for other products also steadily improved.

③ Use of recycled materials

Kao makes efforts to use recycled paper and recycled plastics for packaging materials, taking quality and costs into consideration. The carton and measuring spoon used for *Attack* laundry detergent are made of 100% recycled paper and 100% recycled polypropylene plastics, respectively. Other products for which recycled paper and/or recycled plastics are used are indicated below.

Products in boxes made of recycled paper:

Soap, hair color, toothpaste, bath additives, etc.

Products in containers made of recycled plastic:

Family dishwashing detergent (PET for beverage bottles)

Wide Haiter kitchen bleach (Polyethylene)

Toothpaste display tray (Polypropylene)

Bioré facial cleanser display tray (Polypropylene)

(3) Reduction of Packaging Materials

Trends in the use amount of packaging materials, including outer carton boxes, by material are shown in the graph to the right. The total amount of packaging materials used in fiscal 2001 decreased by 1,100 tons to 127,300 tons year-on-year.

The amount of plastics used is decreasing every year, specifically by 1,100 tons in fiscal 2001 year-on-year.

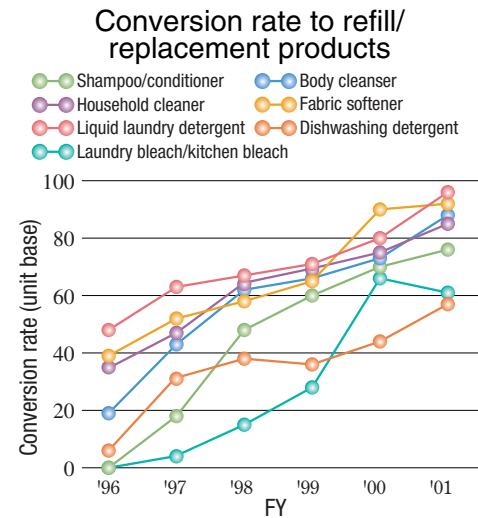
As mentioned in the previous section, the company promotes reduction in the amount of packaging materials used by compacting products and introducing refill/replacement products.

All product categories that currently have compact-type and/or refill/replacement products are shown in the previous section. As for the 7 major category products,* we applied the methods mentioned below to provisionally estimate the reduction of plastics used through introduction of compact-type and/or refill/replacement products.

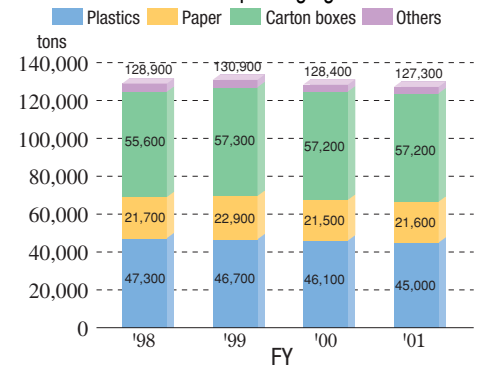
① Refill/replacement products: Estimate the amount of plastics used on the assumption that all products sold are NOT refill/replacement products. (Compact-type products are included in the estimation.)

② Compact-type products: Estimate the amount of plastics used, assuming that all products sold are NEITHER compact-type NOR refill/replacement products.

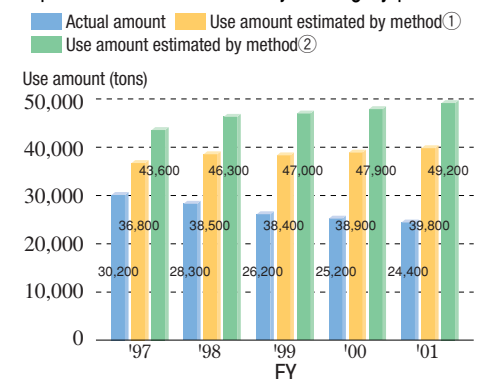
The graph to the right shows the amounts of plastics actually used and those estimated in the above methods ① and ② for the 7 category products.



Trends in the amount of packaging materials used



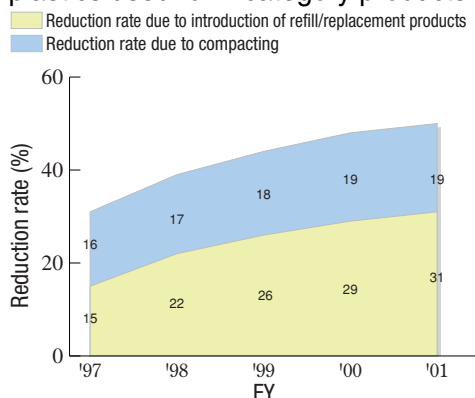
Reduction performance concerning the amount of plastics used for the 7 major category products



* 7 category products compiled

① Liquid laundry detergent ② Fabric softener ③ Laundry bleach ④ Kitchen bleach ⑤ Household cleaner ⑥ Body cleanser ⑦ Shampoo/conditioner

Reduction rate of the amount of plastics used for 7 category products

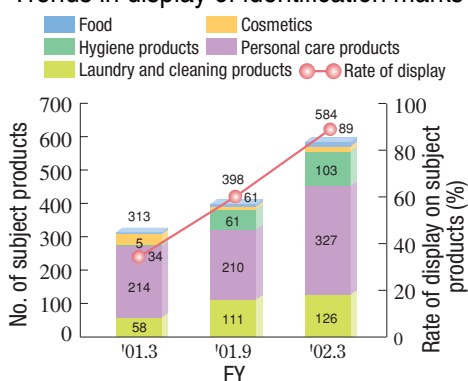


The differences between two figures for each fiscal year indicate the following:

- Difference between the use amount estimated by method ① and the actual use amount implies reduction of use amount due to introduction of refill/replacement products.
- Difference between the use amount estimated by method ② and that by method ① means reduction of use amount, caused by compacting of products.
- Difference between the use amount estimated by method ② and the actual amount shows reduction of use amount, attributed to introduction of compact-type and refill/replacement products.

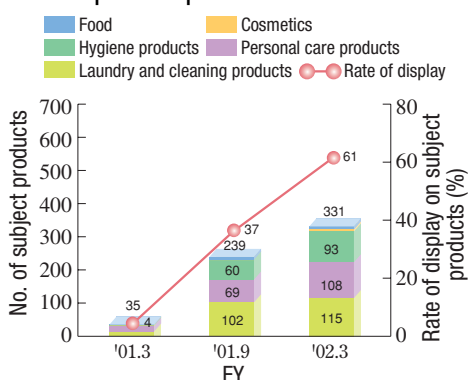
The actual amount of packaging materials used in fiscal 2001 was 24,400 tons, while the use amount estimated by method ② was 49,200 tons. This means that the effect of introduction of compact-type and refill/replacement products was a reduction of the amount of packaging materials used by 24,800 tons or 50%. The breakdown of the 24,800 tons was 9,400 tons (19%) for compact-type products and 15,400 tons (31%) for refill/replacement products.

Trends in display of identification marks



- Laundry and cleaning products: laundry detergent, fabric softener, dishwashing detergent, household detergent, bleach, etc.
- Personal care products: shampoo/conditioner, body cleanser, hair color, toothpaste/tooth brush, bath additives, etc.
- Hygiene products: sanitary napkins, disposable diapers, adult diapers, etc.

Trends in display of specific plastic materials



(4) Display for Identification of Packaging Materials and Specific Plastic Materials



Identification marks for plastic and paper

① Display for identification

The Container and Packaging Recycling Law stipulates the roles for consumers, local authorities and companies respectively to sort garbage, collect sorted garbage, and to recycle garbage. From April 2001, the Law for Promotion of Effective Utilization of Resources requires companies to display identification marks on products and specify whether the packaging is paper or plastic so that consumers can easily sort garbage.

Kao prepared guidelines concerning display of identification marks in August 2000 and promoted labeling of such. As of March 2002, the company places the marks on 584 items or 89% of all products subject to display.

We will complete display of identification marks on all subject products before autumn 2002.

② Display of specific plastic materials

If the packaging is plastic, the company displays major specific materials on as many products as possible as possible.

As of March 2002, 331 items or 61% of all subject products display specific plastic materials.

Companies independently decide how to display specific plastic materials. Although some products have limited package space for display, Kao takes the display area and other relevant laws into consideration and promotes display of such on as many products as possible.



Example of display of specific plastic materials

(5) Products and Technologies Developed with Environmental Conservation in Mind

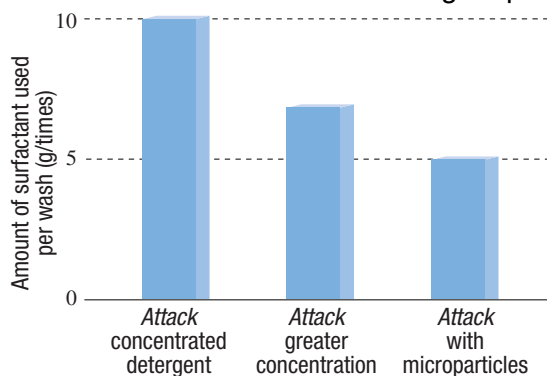
① Environmental measures in development of laundry detergents

Kao's basic approach to environmental conservation is to use fewer resources and make more effective use of the resources that are used in the manufacture of products. The two main aspects of this approach have been to make products more compact and to develop new raw materials.

In view of environmental measures for development of laundry detergent, we developed ingredients that provide greater cleaning power per amount used, and ingredients that have several functions to reduce the amount of detergent used for each wash or load of laundry.

In April 2001, Kao relaunched *Attack* with microparticles, a concentrated detergent to provide high, rapid solubility and strong cleaning power. The improved product was developed in response to changes in consumers' awareness manifested by demand for detergents that would enable them to clean more clothes in shorter amounts of time and to use less water per wash. The porous crystalline structure of *Attack* with microparticles can absorb a nonionic surfactant to provide 20% stronger cleaning power using 30% less surfactant than was the case with conventional *Attack*.

Trends in surfactants used in detergent per wash



② Development of new fatty alcohols for nonionic surfactants

Nonylphenol nonionic surfactants have a wide range of uses, particularly in such products as industrial cleaners and emulsifiers. However, the raw material nonylphenol has been recognized to act as an endocrine disrupter, and finding a substitute material has been an urgent task. In response, Kao has succeeded in developing and bringing to market an ether-type nonionic surfactant made from a fatty alcohol that doesn't generate nonylphenol even after decomposition but is highly biodegradable.

The company has gathered information on this subject into the publication, "Guidelines for Selection of Alternative Surfactants" to help users make informed choices. We will continue to proactively provide information to customers to promote switch to use of safer surfactants.

Trends in the amount of detergent used per wash

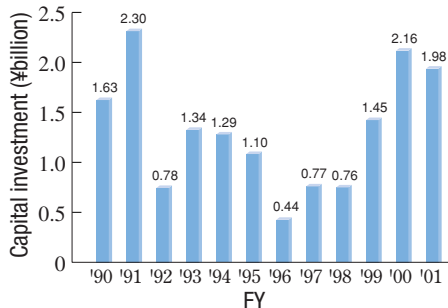
	Package Weight of detergent per wash (g/times)
Until '86	Conventional detergent  40g
'87 to '94	Attack concentrated detergent  25g
'95 to '00	Attack greater concentration  20g
'01 to present	Attack with microparticles  20g



Guidelines for Selection of Alternative Surfactants

4 Production

Trends in capital investment in environmental measures



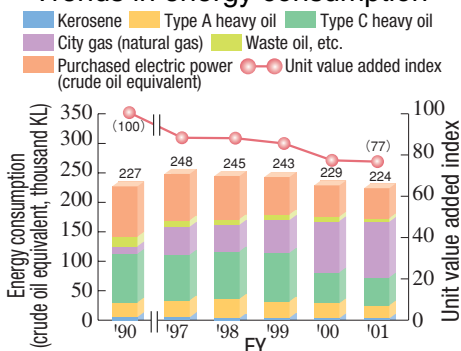
Breakdown of capital investment in environmental measures

Unit : ¥ million

Items	Investment	
	FY 2000	FY 2001
Measures for energy saving and reduction of CO ₂	607	313
Measures for prevention of air pollution	77	50
Measures for prevention of water pollution	335	388
Measures for reduction of waste and recycling	273	650
Measures to counter noise, vibrations and odors	128	75
Production facilities that lessen the burden on the environment	546	228
Research & development aimed at enhancing environmental conservation	188	269
Others	10	10

Total 2,164 1,981

Trends in energy consumption



Introduction of co-generation facilities

1991	Tochigi Plant 1st, 2nd, 3rd facilities; Toyohashi Plant 1st, 2nd facilities
1992	Wakayama Plant 1st, 2nd facilities
1994	Kashima Plant 1st facilities
1995	Ehime Sanitary Products 1st, 2nd facilities; Kawasaki Plant 1st facilities
1997	Tokyo Plant 1st facilities; Tochigi Plant 4th facilities
1999	Kawasaki Plant 2nd facilities
2000	Wakayama Plant 3rd facilities
2001	Sakata Plant 1st facilities; Ehime Sanitary Products 3rd facilities
2002 (planning stage)	Wakayama Plant 4th facilities

(1) Trends and Breakdown of Capital Investment in Environmental Measures

In 1973, following the enactment of various pollution prevention laws, the company focused capital investment in environmental measures. Since that time as well, as a means to conserve the environment, the company has continued such capital investment.

Since environmental accounting was introduced in fiscal 1999, the definition and standard of capital investment in environmental measures have been reevaluated. We incorporated two new items in environmental accounting: production facilities that lessen the burden on the environment and investment in research and development aimed at enhancing environmental conservation.

This year's results The capital investment in fiscal 2001 environmental measures was ¥1.98 billion, which accounts for about 8% of the company's total capital investment in Japan. The cumulative capital investment from fiscal 1973 is ¥29.6 billion.

Primary investment involved new facilities with incinerators for waste disposal in the Kawasaki Plant, Sakata Plant, and Wakayama Plant, new self-generated power facilities in the Sakata Plant, and a pilot plant to research the efficient usage of resources in the manufacturing process of functional fine particles

(2) Energy Conservation

In fiscal 2001, the company set a new target to reduce energy consumption to level 75 and 70 in fiscal 2005 and 2010, respectively, taking the unit value added index in fiscal 1990 as 100. Key strategies to achieve the target for energy conservation include introduction of more co-generation facilities and reduction of energy consumption by raising productivity.

From this fiscal year, we added two sections concerning energy conservation and reduction of greenhouse gas emission (prevention global warming) in this report.

This year's results As a result of activities to conserve energy, we reduced energy consumption (crude oil equivalent) by approximately 5,000 KL, and improved the unit value added index by 0.6 points year-on-year. In comparison with the result in fiscal 1990, energy consumption decreased to 77%. Major activities involved 1) introduction of co-generation facilities in the Sakata Plant, 2) reduction of energy consumption by raising productivity, 3) change from fluorescent lights to an energy saving type, and other heat recoveries.

In fiscal 2001, the Ministry of Economy, Trade and Industry conducted an on-site investigation for type 1 designated energy management factory at the Ehime Sanitary Products Company, Limited and the Tochigi Plant of Kao, and both plants were highly evaluated.

Future issues To achieve the new target, the company will further promote energy conservation through introduction of more co-generation facilities and reduction of energy consumption by raising productivity. In particular, we will focus on

recovering unused energy and introduction of energy saving equipment to continuously strengthen energy conservation activities.

(3) Reduction of Greenhouse Gas Emission

Because the company doesn't emit any greenhouse gas other than CO₂, our environmental measures concerning global warming are focused on the reduction of CO₂.

In fiscal 2001, we set a new target to reduce CO₂ emission in fiscal 2010 by 6% lower than that of fiscal 1990.

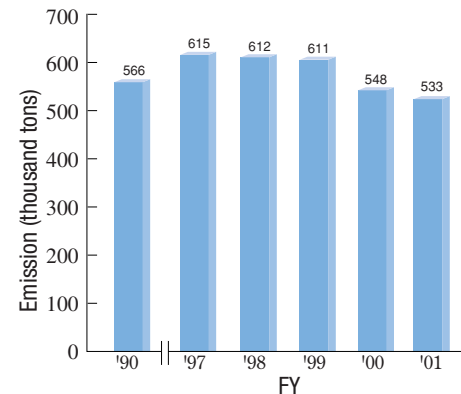
Principal measures to achieve this target include promotion of changeover of fuel to city gas (natural gas) and activities to conserve energy, or in other words, reduction of CO₂ emission attributed to energy consumption.

This year's results CO₂ emission in fiscal 2001 was reduced by 15,000 tons year-on-year and 5.8% lower than that of fiscal 1990. Major contributing factors are: 1) changeover of fuel to natural gas, 2) reduction of energy consumption based on energy saving activities, 3) rate of self-generated power through introduction of co-generation facilities. For prevention of chlorofluorocarbon (CFC) leakage, we strictly maintained refrigerating machinery that uses CFC, which is alleged to contribute to the greenhouse effect.

Future issues The company will further strengthen activities to conserve energy and examine usability of recyclable energy as purchased electric power. Specifically we will consider use of wind power generation, solar power generation, and introduction of "green electric power"* trading system.

Based on the Law for Recovery of CFC effective beginning 2002, the company will further restrict CFC emission, which generates greenhouse gas. When renewing refrigerating machinery, we will consider introduction of refrigerating machinery that doesn't use CFC.

Trends in CO₂ mission



* Green electric power: Electric power generated with natural energy, i.e. solar power, wind power, without emitting CO₂.

(4) Reduction of Waste

The company strengthened activities for the reduction of waste, according to a new target set in fiscal 2001 to reduce the amount of final disposal to under 15% in fiscal 2010, taking the figure in fiscal 1990 as 100%.

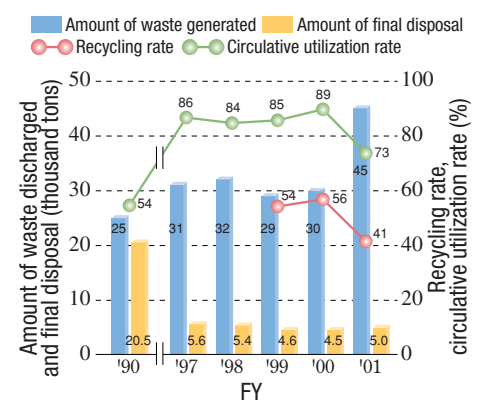
This year's results To reduce sources that generate waste, the company prepared a map that specified the process of each type of waste generated and set measures for each place of waste generation. Due to these measures, the amount of waste was estimated to decrease by approximately 3,000 tons year-on-year.

However, improved key products were a new source of waste, so the amount of waste discharged increased. Implementation of measures was completed at the end of 2001, and the amount of waste discharged steadily decreased in 2002.

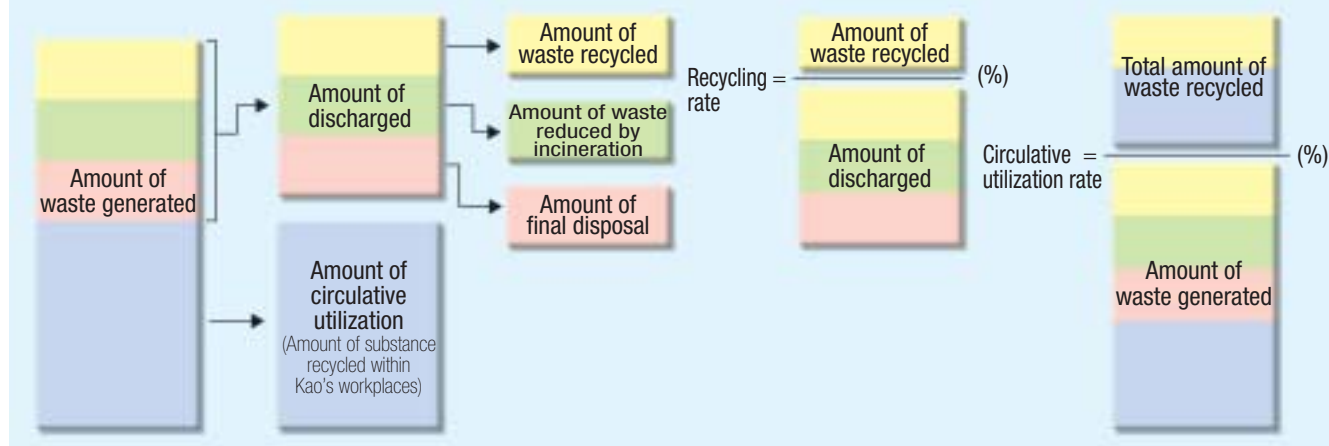
For the above reason, the amount of final disposal increased by 560 tons or approximately 13% year-on-year. It is 25% of the figure in fiscal 1990.

The recycling rate in the graph to the right indicates rates of the amount of waste recycled to the amount of waste discharged. The waste substance flow and the recycling rate and circulative utilization rate of waste are shown in the following chart.

Amount of waste discharged and final disposal, recycling rate and circulative utilization rate of waste



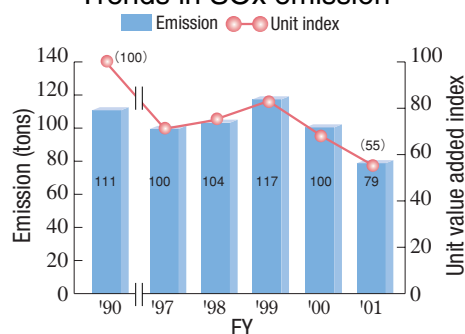
Waste substance flow and definition of recycling rate and circulative utilization rate



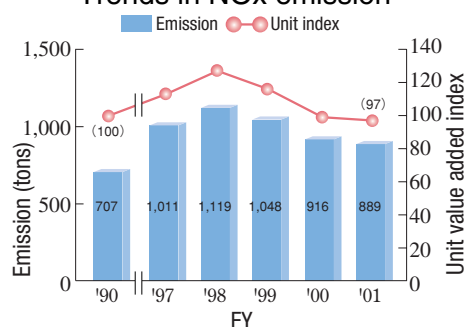
Future issues

The key issue is reduction of waste generated, in particular achievement of zero emission of final disposal. To lead this measure, Ehime Sanitary Products Company, Limited has started full-fledged “zero emission” activities from 2002.

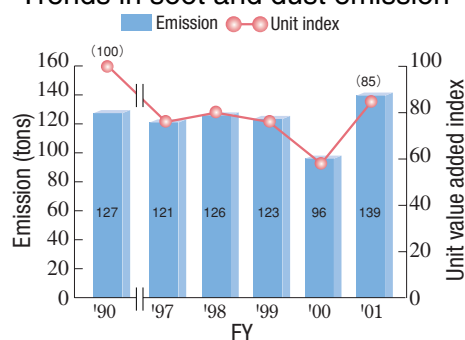
Trends in SOx emission



Trends in NOx emission



Trends in soot and dust emission



(5) Reduction of Air Pollution

To reduce SOx emission, the company has implemented flue gas desulfurization from large boilers, and changed the fuel used in small boilers from type C heavy oil to kerosene or type A heavy oil, which have a lower sulfur content.

The company has also installed low NOx burners to reduce NOx emission, and changed over from public electric power to self-generated power to improve energy efficiency.

Because it has less of an impact on global warming, city gas (natural gas), or so-called “clean energy” is promoted for use at the plants located in urban areas and industrial complexes.

This year's results

In fiscal 2001 at the Sakata Plant, the company changed to use of fuel with a lower sulfur content and transferred production of some product items that use city gas (natural gas) to other plants in order to reduce total SOx emission for the entire company.

As a result, annual SOx emission dropped by 21 tons year-on-year to 79 tons. The unit value added index was lowered by 14 points year-on-year to 55%, taking the fiscal 1990 index set as 100.

The annual NOx emission dropped by 27 tons to 889 tons compared to the previous year. The unit value added index improved by 2 points to 97% in comparison with the fiscal 1990 index set as 100.

Soot and dust increased by 43 tons from last year, although the figure sufficiently cleared the value regulated by the Air Pollution Control Law and other relevant bylaws. This increase was attributed to change in production procedure and method for a new type of powder detergent. The company has already implemented measures to solve this issue. The unit value added index increased by 27 points to 85% in comparison with the fiscal 1990 index set as 100.

(6) Reduction of Water Pollution

The company uses water as a raw material, water to rinse equipment when switching product types, processed water for heating steam and cooling water, and tap water for drinking, toilet and other daily uses.

We have emphasized comprehensive effluence treatment measures since 1972 and have implemented “coagulation treatment,” “biological treatment,” “activated carbon treatment” and other processes.

This year's results In fiscal 2001, the annual use of water dropped by 750,000 tons year-on-year to approximately 12,500,000 tons. Of this total, 85% is comprised of industrial water. This reduction was achieved due to the change in production process for powder detergent, shampoo, and conditioner. In addition, the effluence level decreased to roughly 10,700,000 tons.

In fiscal 2000, we implemented measures to improve capacity of our effluence treatment facility. As a result, we lowered COD emission by 13 tons and improved the unit value added index by 10 points year-on-year to 76%, taking the figure in fiscal 1990 as 100%.

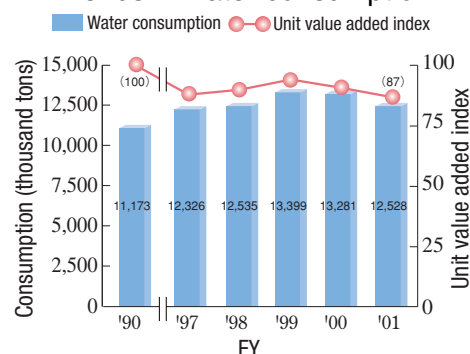
(7) Prevention of Soil Pollution

The company measures 26 substances related to groundwater pollution that are subject to environmental standards at a well inside the Wakayama Plant. The results are shown below, and the well water was recognized to be pollution free.

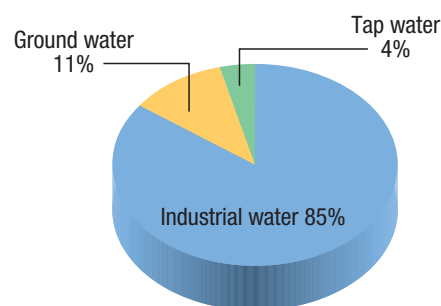
No.	Plant	Wakayama Plant			Standard value for ground water (Unit: mg/L)
	Deep well name Sampling Date	Measuring point A July 24, 2001	Measuring point B July 24, 2001	Measuring point C July 24, 2001	
1	Cadmium	SVL	SVL	SVL	0.01 or less
2	Total Cyanide	ND	ND	ND	ND
3	Lead	SVL	SVL	SVL	0.01 or less
4	Chromium (VI)	SVL	SVL	SVL	0.05 or less
5	Arsenic	SVL	SVL	SVL	0.01 or less
6	Total Mercury	SVL	SVL	SVL	0.0005 or less
7	Alkyl Mercury	ND	ND	ND	ND
8	PCBs	ND	ND	ND	ND
9	Dichloromethane	SVL	SVL	SVL	0.02 or less
10	Carbon Tetrachloride	SVL	SVL	SVL	0.002 or less
11	1,2-Dichloroethane	SVL	SVL	SVL	0.004 or less
12	1,1-Dichloroethylene	SVL	SVL	SVL	0.02 or less
13	cis 1,2-Dichloroethylene	SVL	SVL	SVL	0.04 or less
14	1,1,1-Trichloroethane	SVL	SVL	SVL	1.0 or less
15	1,1,2-Trichloroethane	SVL	SVL	SVL	0.006 or less
16	Trichloroethylene	SVL	SVL	SVL	0.03 or less
17	Tetrachloroethylene	SVL	SVL	SVL	0.01 or less
18	1,3-Dichloropropene	SVL	SVL	SVL	0.002 or less
19	Thiuram	SVL	SVL	SVL	0.006 or less
20	Simazine	SVL	SVL	SVL	0.003 or less
21	Thiobencarb	SVL	SVL	SVL	0.02 or less
22	Benzene	SVL	SVL	SVL	0.01 or less
23	Selenium	SVL	SVL	SVL	0.01 or less
24	Nitrate-N and Nitrite-N	SVL	SVL	SVL	10 or less
25	Fluorine	SVL	SVL	SVL	0.8 or less
26	Boron	SVL	SVL	SVL	1 or less

SVL : Standard value or less ND : Not detectable

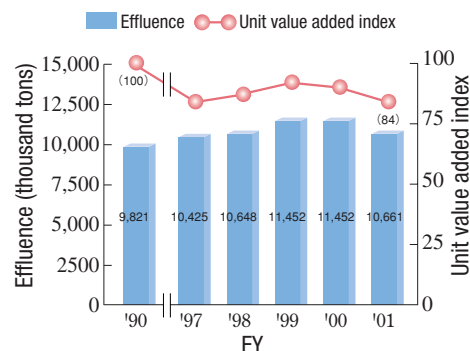
Trends in water consumption



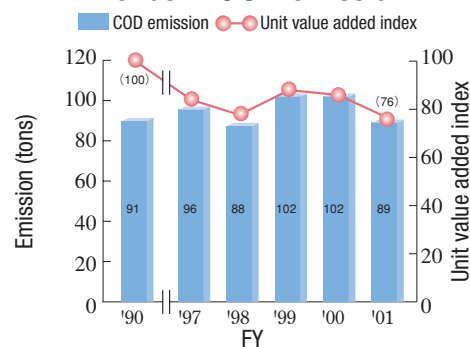
Breakdown of water consumption in fiscal 2001
(Total approximately 12,500,000 tons)



Trends in the amount of effluence



Trends in COD emission



(8) Compliance with Laws and Bylaws

Compliance with laws and regulations is required by the company's Policies Regarding the Environment, Safety and Health. Every Kao plant is obliged to treat adherence to environmental laws and bylaws as an unwavering cornerstone of company policy.

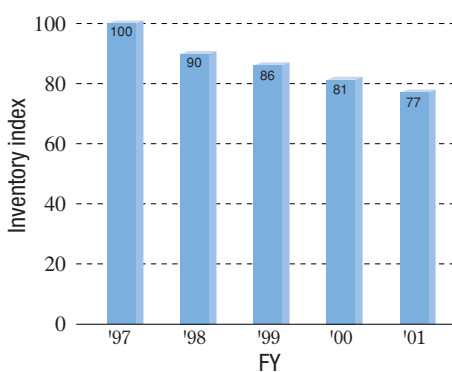
In fiscal 2001, Kao was not charged with any violation of any environmental law or bylaws covering such areas as energy consumption, discharge of atmospheric pollutants, noise, odor or water pollution. This is the record we expect every year.

In 1994, the company transferred a total of 4.5 tons of polychlorinated biphenyls (PCBs)* stored by the plants to the Wakayama Plant for special control. Each year we conduct an inventory check and submit a report to the government agencies involved on the volume of PCBs stored at the Plant. We are now discussing the most appropriate way to dispose of this inventory in accordance with pertinent laws and regulations.

* PCBs, which have superior insulation and fire-resistant properties, were used as chemical materials in electrical transformers and condensers because of their superior chemical properties and thermal characteristics. They were also used in some kinds of fluorescent lights. However, their production has been banned since 1972 because of their harmful effects on human health. Owners of transformers and condensers containing PCBs are legally obliged to properly store or dispose of them and submit reports on the volume they have in storage.

5 Distribution

Trends in consumer products inventory
(Average inventory at month-end)



***1 Kao's means of transportation ratio in fiscal 2001**

Means of transportation	Ratio based on ton km *2
Trailer	54%
Motorbike	12
JR train	22
Freight container	12

*2 "Ton km" for each means of transportation is figured by multiplying the weight of cargo by the transport distance. "Ratio based on ton km" is a ratio based weight \times distance of each means of transportation compared to the total weight \times distance of all means of transportation.

The company is striving to optimize production and shipment, improve forms of transportation by utilizing larger vehicles and modifying product specifications, promote modal shift, which lessens the burden on the environment, and raise efficiency by joint delivery to reduce fuel consumption and exhaust (SOx, NOx, CO₂ emission). Based on the cumulative transporting distance, the exhaust generated due to distribution is estimated and indicated in the diagram of substance flow on page 12. Examples of activities and their results are shown below.

Promote Supply Chain Management to Reduce Inventory

Divisions responsible for production, distribution, and sales are working together on Supply Chain Management activities. The key to the activities is to "supply the right thing in the right amount at the right time." Since 1997, the company has forecasted shipment at each distribution base in Japan and planned transportation based on the forecast to increase efficiency in vehicle loading and equalize load volume. As a result, the inventory of consumer products in fiscal 2001 has been reduced by 2,600,000 packages (equivalent to 2,600 10-ton trucks) compared to fiscal 1997.

Assuming delivery via our usual means of transportation*¹, the reduced amount of inventory results in a reduction of the amounts of CO₂ emission at 1,300 tons, SOx at 390 kg and NOx at 8 tons.

Shown above left is the inventory index, taking average month-end inventory in 1997 as 100.

Management of Chemical Substances

1 Emission Levels of Substances Subject to PRTR Law

The company has participated in the PRTR survey conducted by the Japan Chemical Industry Association for the past several years. We have reported emissions and transport levels involving the environment for chemical substances handled or manufactured by the company. These results were also covered in the report for fiscal 1999.

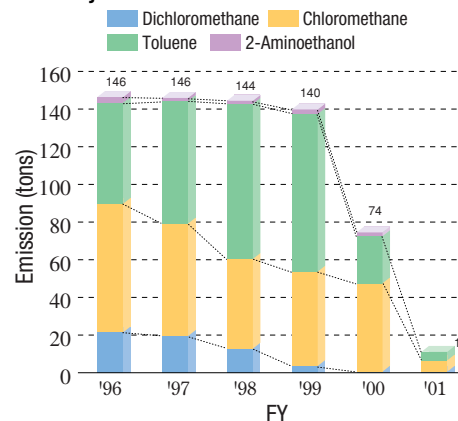
The chemical substance management promotion law (PRTR law) requires emission levels to be reported from fiscal 2002. In line with this, the company has changed substances surveyed to those subject to the PRTR law.

Kao looked two years ahead to independently set the level of 1 ton and over of emission as the level to be reported, and identified 57 such substances in fiscal 2001. Among those substances, there were 48 substances whose emission was over 5 tons. This is the level currently required to be reported. Our total use level for the year was 168,000 tons. There were 12 tons of emission into the air and 1.6 tons of emission to public water, while there was no emission to the soil. The table below indicates the emission levels per subject substance.

We will discuss the subject substances whose emission was over 1 ton as well as emission levels of those substances in the section of "Environmental Measures and Discharge Amount by Plant" on pages 34 to 41.

As for substances emitted into the air in large volumes, the company set targets to reduce emission to less than 1 ton annually per plant and established measures to attain the targets. As a result, the emission levels were dramatically reduced in fiscal 2001, and the targets were almost achieved. A remarkable factor that was attributed to this achievement was introduction of facilities to collect and burn solvents in processes where toluene and chloromethane were used.

Emission levels of substances subject to PRTR law into the air



Emission levels of substances subject to PRTR law (FY 2001)
Substance whose annual use level in each plant was over 1 ton covered

(kg/year)

Cabinet order No.	Names of substances	Amount of emission in the air
1	Zinc compounds (water-soluble)	0
3	Acrylic acid	0
4	Ethyl acrylate	0
6	Methyl acrylate	0
7	Acrylonitrile	0
16	2-Aminoethanol	4
17	N-(2-Aminoethyl)-1,2-ethanediamine; Diethylenetriamine	0
21	m-Aminophenol	0
23	1-Allyloxy-2,3-epoxypropane	0
24	n-Alkylbenzenesulfonic acid and its salts (alkyl C=10-14)	0
28	Isoprene	420
29	4,4'-Isopropylidenediphenol; Bisphenol A	0
42	Ethylene oxide	67
43	Ethylene glycol	15
46	Ethylenediamine	0
54	Epichlorohydrin	47
56	1,2-Epoxypropane; Propylene oxide	2
58	1-Octanol	0
63	Xylene	410
65	Glyoxal	0
68	Chromium and chromium (III) compounds	0
80	Chloroacetic acid	0
95	Chloroform	340
96	Chloromethane; Methyl chloride	6,000
102	Vinyl acetate	0
145	Dichloromethane; Methylene dichloride	68
166	N,N-dimethyldodecylamine N-oxide	0
176	Organic tin compounds	0
177	Styrene	19

Cabinet order No.	Names of substances	Amount of emission in the air
205	Terephthalic acid	0
207	Copper salts (water-soluble, except complex salts)	0
227	Toluene	4,530
231	Nickel	0
232	Nickel compounds	0
242	Nonylphenol	0
251	bis (Hydrogenated tallow) dimethylammonium chloride	0
254	Hydroquinone	0
266	Phenol	1
269	di-n-Octyl phthalate	0
270	di-n-Butyl phthalate	0
272	bis (2-Ethylhexyl) phthalate	0
273	n-Butyl benzyl phthalate	0
292	Hexamethylenediamine	0
297	Benzyl chloride	0
300	1,2,4-Benzenetricarboxylic 1,2-anhydride	0
304	Boron and its compounds	0
307	Poly (oxyethylene) alkyl ether (alkyl C=12-15)	1
308	Poly (oxyethylene) octylphenyl ether	0
309	Poly (oxyethylene) nonylphenyl ether	0
310	Formaldehyde	11
311	Manganese and its compounds	0
313	Maleic anhydride	0
314	Methacrylic acid	0
318	2-(Dimethylamino) ethyl methacrylate	0
320	Methyl methacrylate	6
336	3-Methylpyridine	0
Total		11,941
179	Dioxins (unintentionally formed substances, unit: mg per year)	486

2 Management of Safety Information on Chemical Products

(1) Management of Safety Information for Chemical Substances

The company has developed a Master Index (MI), the company's proprietary code to identify chemical substances. We are also building a system that can manage all chemical substances from individual ingredients to final products. The system is an integrated database of chemical substances. To control chemical products, the company will begin operation of the system, which works with MI and integrates a database of laws and regulations, a new MSDS preparation and reference system, and a system for products under planning, in autumn 2001. Approximately 9,000 substances are registered in MI.

(2) Thorough Introduction of MSDS and Yellow Cards

The company has completed introduction of MSDS (Material Safety Data Sheet) and Yellow Cards. The table below shows the number of products for which MSDS was newly prepared or revised in fiscal 2001 according to the above-mentioned system in use of MI as the key code.

	Prepared in fiscal 2000			Cumulative total
	Newly prepared	Revised	Subtotal	
Japanese version	521	2,105	2,626	3,770
English version	197	531	728	1,224
US version	42	19	61	342
EU version	17	0	17	191
Total	777	2,655	3,432	5,527

22 Yellow Cards were issued in fiscal 2001, so the accumulative total of Yellow Cards issued is 4,951. Along with the thorough introduction of MSDS and Yellow Cards, the company operates a system that permits view of MSDS via the internet at each distribution base for chemical products and publicly furnishes comprehensive safety information.

(3) Compliance with Laws and Regulations when Exporting Chemical Substances (Export management)

Due to the current international situation, including the terrorist attacks in the U.S., the Export Trade Control Ordinance was revised, and the Catch-All Controls* were introduced in Japan on April 1, 2002. In addition to our conventional methods of judging whether export of Kao's products and samples pass laws and regulations, i.e. the United Nations dangerous substances classification, and applicability of the Export Trade Control Ordinance, the company has newly designed and implemented an internal checking system to comply with the Catch-All Controls and contribute toward sustaining international peace and safety.

* Catch-All Controls: System in which export companies, themselves, confirm through preliminary review of usage and users that all export goods and/or technologies cannot be used for a military purpose.

3 International Contribution for Management of Chemical Substances

In 1992, the Organization for Economic Co-operation and Development (OECD) decided to summarize safety data concerning chemical substances mass-produced around the world. These substances are known as High Production Volume Chemicals (HPV). Following the decision by the OECD, the International Council of Chemical Association (ICCA) takes initiatives to organize safety data in cooperation with chemical corporations around the world.

The method to organize data is to establish a consortium or community among companies that manufacture and use the same HPV. The member companies collect and present information, including findings that have been already announced in research papers, test results and their usage that each company possesses, and production volume. Using such information, the consortium brings information together to present how dangerous the chemical substance is in a conference held by the OECD for judgement of the risk. These activities are conducted independently by chemical corporations to exercise their social responsibility. The companies, therefore, aim to achieve "protection of workers, consumers, and customers," "abolishment of unnecessary animal testing," and "conservation of the global environment."

Kao participates in an HPV consortium that studies on "sodium n-alkylbenzene sulfonate," which is a key surfactant in laundry detergent, and "fatty alcohol." We are developing cooperative relationships with other companies in the same industry around the world and exerting the greatest possible effort to promote international contribution.

On the other hand, we apply the same approach to non-HPV raw materials and products. The company, as a member of Japan Soap and Detergent Association, cooperates with other companies in the industry to promote improved safety in relation to detergent. Also as a representative member of the above Association, the company participates in the Human & Environmental Risk Assessment for laundry detergents (HERA) in Europe. In fiscal 2001, we attended all four conferences in Brussels, Belgium, and explained the situation in Japan to build mutual trust and share information.

In addition, Kao participates in an international activity called Long-range Research Initiative (LRI) in parallel with a safety inspection program concerning HPV. LRI, a long-term independent fundamental research concerning impact of chemical substances on human health and the environment, is promoted under ICCA in cooperation between the chemical industry in Japan, the U.S., and Europe, namely the Japan Chemical Industry Association (JCIA), American Chemistry Council (ACC), and Centre europeen des federations de l'industrie chimique (CEFIC). Kao agrees the initiatives and strives to contribute to study of hypersensitivity as a member of the JCIA Science Task Force and LRI Working Group, which focuses on study of chemical carcinogenesis, endocrine disrupters, and hypersensitivity.

Worldwide situation concerning HPV and screening procedure

In 1992, the OECD (Organization for Economic Co-operation and Development) determined to ensure safety related to HPV (High Production Volume Chemicals).

ICCA-HPV substances

Definition: Substances whose annual production is over 1,000 tons (or 1 million pounds in the U.S.) in two or more areas in the U.S., EU, and Japan.

Establish an international consortium by manufacturers

(Leader company selected to carry out tasks)
Confirm existing data (contents and credibility)
Preparation of initial assessment document (SIDS)

Decide the sponsor nation

(The sponsor nation explains details in the OECD)
Adjust opinions between the sponsor nation and the consortium

Screen in the SIAM meeting by the OECD

Further survey and tests required

No additional survey currently required

OECD authorizes at the HPV Task Force

Kao's participation in HPV consortiums

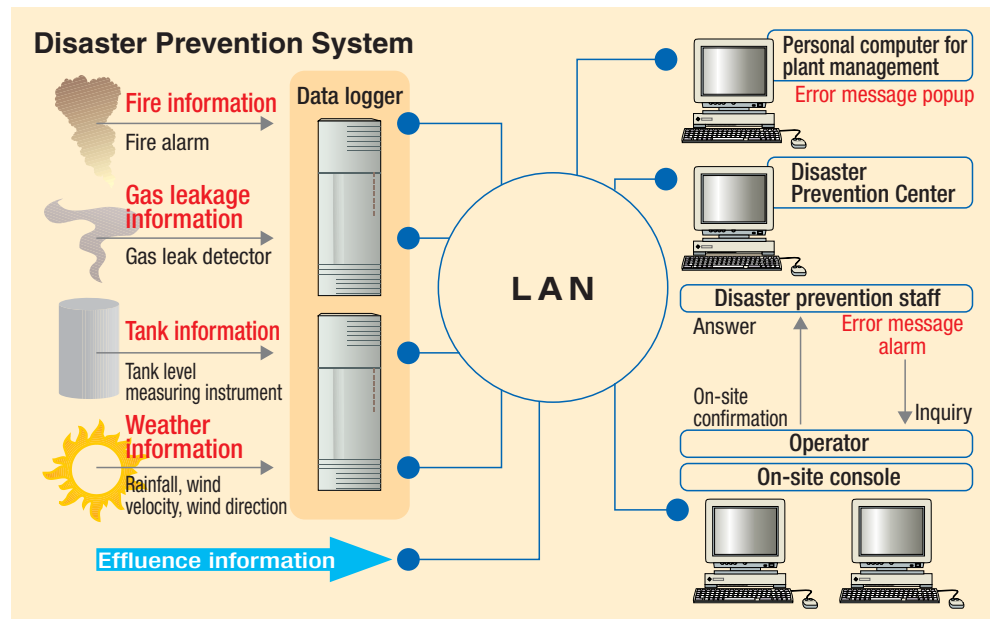
- Consortium organized by the US SDA (Soap and Detergent Association)
Fatty alcohol, surfactants, sodium alkylbenzene sulfonate
- Consortium organized by the Japan Sulfuric Acid Association
Sulfuric acid (The study is completed)
- Corporation with other companies in Japan to study two other chemical substances

Chapter 4

Activities for Occupational Safety and Disaster Prevention

1 Management System

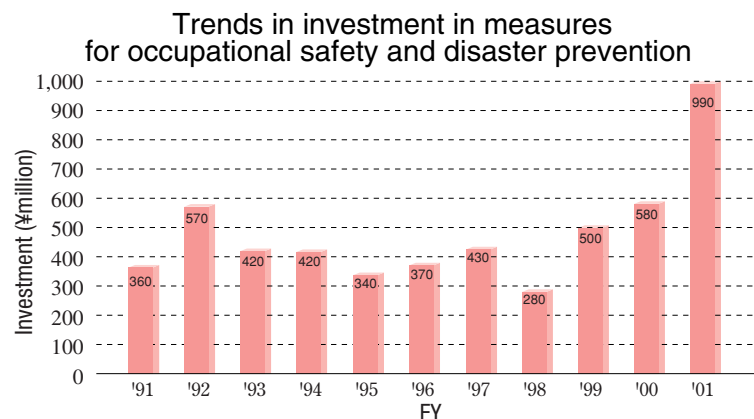
The company is pursuing creation of a workplace in which disasters don't occur based on the concept that "Safety is the foundation of corporate activities." However, we have built a "Disaster Prevention System" at each workplace to minimize disaster if it happens. The chart below shows an example Disaster Prevention System in the Wakayama Plant and Research Laboratories.



2 Performance of Activities

(1) Capital Investment

The total investment for occupational safety and health, process safety and disaster prevention rose to 990 million yen. The breakdown is, measures for occupational safety and work environment improvement accounted for 42%, countermeasures for explosions, fires, and leakage 30%, countermeasures for earthquakes and other natural calamities 22%, and other 6%.



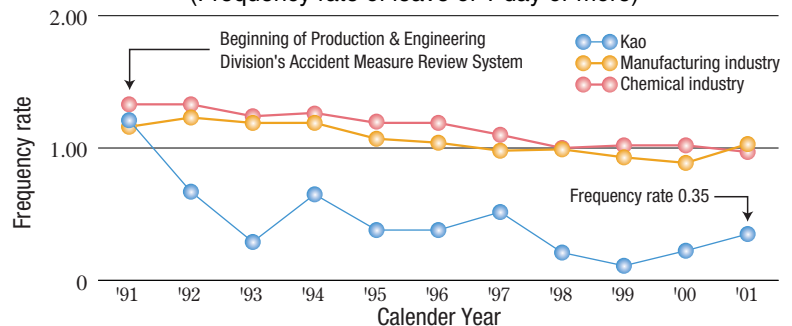
(2) Trends in Labour Accidents in Japan

- In 2001, accidents resulting in personnel leave at the Production & Engineering Division and Research & Development Division totaled three. Two out of three were accidents resulting from people becoming “caught” in machinery. Reflecting upon potential source of danger, we conduct activities to eliminate or minimize source of danger instead of avoiding insecure working environment on individual basis.
- The Wakayama Plant achieved the longest safety record of 22.3 million hours of no accidents resulting in personnel leaves in the soap and synthetic detergent industry on October 27, 2001. The Plant was honored with a safety certificate of highest order by the General-General of the Labour Standards Bureau, the Ministry of Health, Labour and Welfare in Japan.



Certificate awarded to the Wakayama Plant

Trends in accidents resulting in personnel leave in Japan (Frequency rate of leave of 1 day or more)



Frequency rate: number of injuries and deaths by accidents per 1 million working hours

(3) Effects from Introducing Risk Assessment Related to Operations

The company conducts risk assessment (RA) in which it extracts the potential risks and handling or operational tasks by machinery and facility to determine whether such risk is at a level deemed admissible for workers or not.

If that risk is greater than what is deemed admissible, the company will terminate or reduce or change tasks or eliminate or reduce potential cause of the accident (source of the danger). Here we introduce some activities conducted by the Tokyo Plant.

A group, which consists of three personnel, RA Promotion Leader, personnel responsible for production lines, and personnel responsible for facilities, listed up machinery and personnel tasks by facility. Such tasks include task related to machine in operation, maintenance work, error correction, adjustment for test operation. A part of performance of RA activities is summarized in the table below. Among common tasks conducted without being aware of any danger, the group found 7 risks that are not deemed admissible. The company immediately implemented measures to eliminate sources of the dangers.

Examples of Risk Assessment (RA) conducted

	Basic safety measures	Before RA	After RA
Rank I : Risks not deemed admissible	Immediately suspend tasks and implement safety measures	7	0
Rank II : Risks deemed admissible with conditions	Implement measures to bring the rank closer to Rank III	80	8
Rank III : Risks deemed admissible	Not necessary to implement further safety measures	151	230
Total number of tasks		238	238

Standards to categorize risks

		Frequency of tasks			
		Daily [a]	Weekly [b]	Monthly [c]	Annually [d]
Levels of injuries	Serious injury [A]	Rank (I) [Aa]	Rank (I) [Ab]	Rank (I) [Ac]	Rank (I) [Ad]
	Resulting in leave [B]	Rank (I) [Ba]	Rank (I) [Bb]	Rank (II) [Bc]	Rank (II) [Bd]
	No leave [C]	Rank (II) [Ca]	Rank (II) [Cb]	Rank (II) [Cc]	Rank (II) [Cd]
	Minor injury [D]	Rank (II) [Da]	Rank (II) [Db]	Rank (III) [Dc]	Rank (III) [Dd]
	No injury [E]	Rank (III) [Ea]	Rank (III) [Eb]	Rank (III) [Ec]	Rank (III) [Ed]

Chapter 5

Exchanges with Local Communities and Consumers

1 Communication with Consumers and Customers

We endeavor to provide superior products that impress and satisfy the needs of our consumers as they express them to us. To achieve this, the company has established the Consumer Information Center, where we sincerely listen to and closely communicate with our consumers to reflect their feedback in our corporate activities.

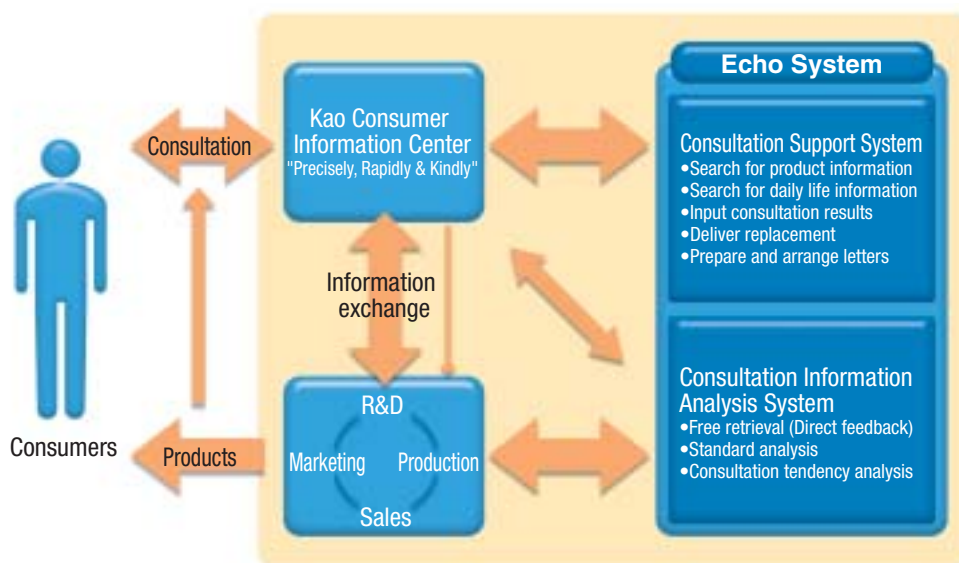
Through direct and bi-lateral communication with consumers on the phone or by email, letters, and other means, the Center currently receives approximately 100,000 inquiries per year.

Besides opinions about Kao's products, consumers express their concerns originating from distrust in companies and insecurity about products in relation to the recent state of society. In particular, since cows suffering from BSE (bovine spongiform encephalopathy) were found in Japan in 2001 and 2002, consumers became more anxious and inquired about ingredients derived from cows and used in cosmetics.

The company collected information about this issue, properly communicated, and switched ingredients based on government request. We also conducted market research, swiftly withdrew relevant products from the market, and provided as much explanation as possible to consumers to ease their anxiety.

In reference to consumers' opinions, we have developed such products as mildew remover with a spray locking function for prevention of misuse and refill pouch products for *Keeping* laundry starch for the washing machine, which was highly demanded and requested by many consumers.

We exert efforts to enable consumers to easily obtain the latest information on our products. We have improved the "Kao Product Advisory Bureau" on the Kao Website and the "Coloring Information Box," where information can be retrieved by fax or recording system on the phone. (The content is currently available only in Japanese.)



Kao also has established the Echo System to respond to inquiries from consumers as well as to analyze and reflect consumer needs directly in product development. We continuously improve this Echo System in line with IT development.

2 Exchanges with Local Communities

In addition to our consistent efforts to bi-directionally communicate with consumers and customers, the company proactively conducts activities to contribute to the society with the recognition that activities to enhance and improve mental well being and to protect and foster an environment beneficial to children and future generations are significant roles for companies.

(1) Support Environmental Conservation Activities

– Support the “Creating Forests for Everyone” campaign –

Kao has supported citizens' environmental activities through the original program organized jointly with the Urban Greenery Fund, to create an environment where people can come into close contact with nature in their living environment.

Activities by 25 organizations that we supported in fiscal 2000 have been successful. In fiscal 2001, we selected 32 organizations for donation.

In 2002, Kao decided to include the “Creating Forests for Everyone Campaign Mark” on all of the company's refill pouch products to communicate our activity support through our products and heighten environmental awareness in cooperation with consumers.

Activities by organizations selected for donation



Asoka Gakuen School Group



Maruyama Sanctuary



Hakata Yume-matsubara-no-kai NPO

Location of organizations selected for donation in fiscal 2001



Refill pouch products with "Creating Forests for Everyone" Campaign Mark



Creating Forests for Everyone Campaign Mark



Kao staff members joining activities



Nikko cedar colonnade



Pine forest around the site of the Wakayama Plant



Forest where Kashima Plant staff members planted trees



Cleaning activity in the vicinity of the Sakata Plant

• Support methods

Through the Urban Greenery Fund, a portion of sales from Kao refill pouch products are donated to selected volunteer groups, NPOs, and other organizations that conduct activities to protect and nurture forests in the community. Specific activities include preservation of trees, planting, cutting weeds, creating ponds and bird feeders, and nurturing big trees that can become a symbol of the community.

• Activities with Kao staff members as volunteers

From fiscal 2001, Kao staff members aggressively participate in activities supported by the "Creating Forests for Everyone" campaign. 11 Kao staff members participated in the "Kagayaki-takamaru" NPO in Kobe, which was selected for donation in fiscal 2001. Together with other local volunteers, they planted 150 Hanamomo peach trees in a park of the community.

(2) Environmental Beautification and Conservation Activities in Community

Each of Kao's plants conducts activities to beautify and conserve the environment of the community according to the location.

The Nikko cedar colonnade was built by planting approximately 24,000 trees along the three roads leading to Nikko Toshogu Shrine 370 years ago. 13,000 trees currently remain, but approximately 100 trees die every year due to pollution from traffic and environmental deterioration.

The colonnade is now protected under the management of Tochigi Prefecture as a designated national property. Nikko Cedar Colonnade Ownership began in the autumn of 1996. As it was the first project of this kind, the system was introduced not only in Tochigi Prefecture but widely throughout Japan.

In support of the purpose of this activity, the company contributes to the preservation of this historical cedar colonnade.

Cleanups are also carried out regularly in the vicinity of each of Kao's plants.

Each plant promotes exchange with the community on its own way.

For example, the Wakayama Plant carefully preserves pine forest, which has existed since the Edo Era, around the plant site. In the Kashima Plant, each staff member planted “his/her own tree” to promote environmental conservation.

(3) Provision of Information

- **Introduce information about environmental measures in audio format (CD) for visually impaired people**

The company annually issues “Kao Voice Guide for Products and Lifestyle” (CD) to provide information on Kao's products and daily life to visually impaired people.

We received many inquiries about our environmental measures and countermeasures concerning BSE or mad cow disease problems, which are recognized as serious issues in the society. In response to these inquiries, Kao added the safety measures for Kao products in the above audio CD in fiscal 2002.

- **Chemical experiment classes at schools for next generation**

As a manufacturer of chemical products, i.e. detergent, which children use at home, Kao dispatches the young researchers to provide touring chemical experiments at schools. It is intended to raise children's interest in chemistry. In fiscal 2001, touring chemical experiments were provided at the following schools.

June	Junior High School of Ochanomizu University, Tokyo
July	Azuma Daini Junior High School, Tokyo
August	Chemical exhibition at Shinjuku Takashimaya department store, Tokyo Joto Junior High School, Wakayama
October	Hayato Junior & Senior High School, Yokohama
November	Nishihama Junior High School, Wakayama Society for the study of science education at senior high schools, Osaka



Chemical experiment class at Nishihama Jr. High School, Wakayama

Environmental Measures and Discharge Amount by Plant

Wakayama Plant 1334, Minato, Wakayama-shi, Wakayama 640-8580 Japan

●Description of business

Production of laundry detergent, fabric softener, bleach, dishwashing detergent, household cleaning detergent, shampoo & conditioner, soap, toothpaste, surfactant, fatty chemical products; fundamental research and research for commercialization

●Environmental burden data

Classification	FY				
	1997	1998	1999	2000	2001
Total production output	694,871	654,953	518,536	561,000	566,064
CO ₂ emission	301,036	298,104	292,826	252,265	237,202
Waste discharged	10,167	8,111	8,070	9,644	10,170
Final disposal for landfill	3,807	3,456	2,824	3,009	3,027
SO _x emission	29	33	35	27	23
NO _x emission	384	400	352	286	287
COD emission	71	64	80	79	70

Emission of substances subject to the PRTR law (FY 2001)			
Cabinet order No.	Name of substance	Air	Public water
96	Chloromethane	6.0	0

(Listed above is the substance subject to the PRTR law whose amount of emission was over 1 ton.)

Environmental considerations have long been a priority in the operation of the Wakayama Plant. In February 2000, the Wakayama Plant and Wakayama Research Laboratories received ISO14001 certifications. We set targets and goals to conduct environmental activities based on the Kao's environmental policy.

Major environmental activities include energy and resource conservation and reduction of waste. To reduce energy consumption, CO₂ emissions, and air pollution burden, the Plant continues to introduce co-generation facilities and change fuel to city gas (natural gas). We make efforts to save energy in the manufacturing process and also in the office. We are focusing particularly on achieving a higher yield in terms of chemical reaction and reducing raw materials and other resources consumed through improvements in production processes. The Plant has also made special efforts to make use of IT to reduce generation of waste and to recycle and reuse waste materials. Targets set for the Plant's ongoing environmental activities include a decrease in energy consumption to level 76 by fiscal 2010, CO₂ emissions to 82% and final disposal to 15.2%, taking the unit value added index in fiscal 1990 as 100%.

The Plant has long been carrying out an independent program for reducing chemical substances released into the air by installing exhaust gas treatment equipment and reviewing and maintaining the production process.

Our Research & Development Division makes efforts to develop products that place less of a burden on the environment. We position production development and technology development as an important Responsible Care activity.

Plant management is calling on all personnel to work together to reduce the Plant's environmental impact even further. To do this we will continue to energetically make the best use of the ISO system, even though social changes can be expected to change the way in which we address environmental issues. Along with cost reductions, the Plant will seek continuous improvement of its environmental performance. We will strive to predict and avoid environmental risks, and win a higher evaluation of these efforts from society.

In the area of process safety and disaster prevention, under the Wakayama Plant's slogan "An All-Out, Company-Wide Effort for Safety and Environmental Conservation," we are conducting a risk assessment of our machinery and equipment to identify factors that could lead to danger or damage and to take remedial action. We are also taking steps to strengthen the Plant's security and safety system. Toward that end, we have created our own disaster prevention video to use in the training of personnel who handle safety and security duties. Due to the efforts outlined here, the fiscal year just ended was one more year during which there were no labor accidents that resulted in personnel leave. For a period of over seven consecutive years, since December 1994, the Plant operated 22.3 million hours without labor accident. This achievement, which is the longest safety record in the industry, was cited for recognition by Ministry of Health, Labour and Welfare in Japan which awarded the Plant a safety certificate of the highest order. We continue to hold the record for continuous hours of safe operation that we set for our industry.

Through its multi-faceted efforts, the Wakayama Plant will seek to continue its record of no accidents and to build a more advanced safety and disaster prevention system.



Toshiyasu Suda

Toshiyasu Suda
Manager, Wakayama Plant

Tokyo Plant 2-1-3 Bunka, Sumida-ku, Tokyo 131-8501 Japan

●Description of business

Production of cosmetics;
research for commercialization

●Environmental burden data

Classification	FY				
	1997	1998	1999	2000	2001
Total production output	15,661	15,344	4,835	5,221	4,870
CO ₂ emission	12,735	13,033	13,454	12,192	11,557
Waste discharged	1,459	1,421	1,384	2,141	1,757
Final disposal for landfill	100	100	651	161	75
SO _x emission	<1	<1	<1	<1	<1
NO _x emission	<1	<1	<1	<1	<1
COD emission	<1	<1	<1	<1	<1

Emission of substances subject to the PRTR law (FY 2001)

There was no substance subject to the PRTR law whose emission was over 1 ton.

Because effluence containing COD drains to public sewage, data for COD reflects subtraction at the sewage treatment plant based on the subtraction rate.

The Tokyo Plant is a complex of operations comprising Production & Engineering Division, Research & Development Division, several Business Divisions linked to the Head Office organization, and the Corporate Staff Division. Each division in the Plant is involved in a specific process such as product design, development, production, distribution, consumption or disposal that is covered by the Plant's program to promote environmental conservation activities. Our fundamental policy is based on the guiding principle of engaging in production with less impact on the environment – throughout the entire life cycle of the product.

Specifically we endeavor to develop refill/replacement products and products whose consumption places less burden on the environment. We also make efforts to reduce packaging materials used. These activities are based on our environmental conservation measures with attention to the environmental impact placed after consumers utilize our products. We are also committed to activities designed to save resources, save energy and reduce waste disposal.

Through these efforts, the Plant was able to reduce energy consumption to level 45.8 in fiscal 2001, taking the unit value added index in fiscal 1990 at 100. This was a 7.0 point improvement from the previous year. The unit value added index for waste disposal was reduced by 10.4 points year-on-year to 31.2, also based on an index level of 100 in 1990.

According to the safety and health policy we established based on the Management System for Occupational Safety and Disaster Prevention concepts, we conduct deliberate and continuous activities in a PDCA cycle of four phases – Plan, Do or implementation, Check for evaluation, and Act for improvement. In fiscal 2001, the Plant implemented a risk assessment of its machinery and by identifying and evaluating potential risks and establishing preventive measures in order to prevent labor accidents.

Based on Responsible Care activities, the Plant will continue to utilize the Environmental Management System (based on ISO14001 standards) and Management System for Occupational Safety and Disaster Prevention to improve its environmental performance and attain a higher level of safety and health.



Ryokichi Namekata

Ryokichi Namekata
Manager, Tokyo Plant

Sakata Plant 2-1-18 Ohama, Sakata-shi, Yamagata 998-0064 Japan

●Description of business

Production of pore packs, facial care sheets, and bath additives

●Environmental burden data

Classification	FY				
	1997	1998	1999	2000	2001
Total production output	89,114	91,580	85,608	72,796	35,180
CO ₂ emission	22,991	23,500	22,830	21,614	13,761
Waste discharged	2,983	3,402	2,900	1,860	1,647
Final disposal for landfill	224	359	208	258	219
SO _x emission	49	51	51	43	17
NO _x emission	43	43	37	40	45
COD emission	1	2	2	1	1

Emission of substances subject to the PRTR law (FY 2001)

There was no substance subject to the PRTR law whose emission was over 1 ton.

The Sakata Plant received ISO14001 certification in April 2001. Over the past two years, steady progress has been made as a result of the Environmental Management System (EMS) activities. Even though the Sakata Plant is located in a district specially zoned for factory use, one side of the plant site is adjacent to a residential area. In view of this, it is our basic policy to give the fullest consideration to the surrounding environment, to carefully manage waste materials, eliminate excessive noise and foul odors, and to reduce energy and resource consumption.

As for saving energy, in fiscal 2001, the Plant was able to reduce energy consumption by 45% from the level of the previous year. Our goal is to reduce this further – by 40% year-on-year in fiscal 2002. Although changes in the types of products made are a primary factor for the reduction, the introduction of co-generation facilities and the installation of pipes between our western and eastern plant facilities enable us to raise efficiency in the use of utilities and facilities, and to steadily make progress in environmental management, including such detailed aspects of EMS as controlling air conditioning and lighting.

In fiscal 2001, we were also able to reduce the volume of waste materials discharged by 3% year-on-year. The target for fiscal 2002 is to achieve a significantly greater reduction of 10%.

Concrete measures include efforts to reduce losses that occur in the production and changeover processes. In addition, we are tracing the flow of resources to ensure that the manufacturers of each resource are involved in activities to achieve reductions. Waste paper such as copier paper, carton boxes, newspaper is highly recyclable, while other types, which are called mixed paper, are less recyclable and used only for toilet paper or egg cases. However, the Plant collects and recycles mixed paper to promote paper recycling. In fiscal 2001, this activity enabled us to recycle approximately 42 tons of paper as a reusable resource.

In December 2002, the Plant installed a new incinerator for on-site burning of all waste materials and obsolete products generated by the entire company. This enables us to further reduce disposal of waste materials and to benefit from thermal recycling.

As part of our policy to enhance our relationship with the local community, we are carrying out a program to conduct regular patrols to ensure full consideration is being given to the neighboring residential areas and that improvements are being made.

The Plant considers safety to be important activities in addition to environmental conservation.

In fiscal 2001, we unfortunately had an accident resulting in personnel leave for the first time in seven years. On the basis of a careful review of the causes of the accident, we are carrying out a systematic safety and health program and a risk assessment system for all plant units.

Our aim is to steadily upgrade the systems used in our production operations to a level as high as anywhere in the world. All Plant employees will cooperate closely to that end.



Hirokazu Nakayama

Hirokazu Nakayama
Manager, Sakata Plant

Kawasaki Plant 1-2 Ukishima-cho, Kawasaki-ku, Kawasaki-shi, Kanagawa 210-0862 Japan

●Description of business

Production of laundry detergent, laundry finisher, laundry bleach, dishwashing detergent, kitchen bleach, household cleaner, shampoo, conditioner, body care products

●Environmental burden data

Classification	FY				
	1997	1998	1999	2000	2001
Total production output	348,335	341,726	368,151	368,760	391,789
CO ₂ emission	53,510	52,258	61,923	64,086	71,650
Waste discharged	1,731	1,979	2,655	4,560	19,438
Final disposal for landfill	135	50	0	132	760
SO _x emission	<1	<1	<1	<1	<1
NO _x emission	22	18	19	11	17
COD emission	3	3	4	4	3

Emission of substances subject to the PRTR law (FY 2001)

There was no substance subject to the PRTR law whose emission was over 1 ton.

Located in the Tokyo Metropolitan area, the Kawasaki Plant plays an important role in Kao operations by serving as a key production facility in eastern Japan. The Plant, which carries out full-fledged Environmental Management System (EMS) activities, received ISO14001 certification in March 2001. In addition, we fully converted to the use of natural gas as fuel for the Plant in 1995. Co-generation facilities were already in use by 1996. Our current targets for our ongoing EMS activities include reducing waste and energy consumption that tend to increase along with increases in the scale of production.

In fiscal 2001, we addressed the issue of rising levels of discharged waste resulting from changes in production processes by increasing the capacity of our effluence treatment facilities. This effort included the installation of incinerators that could burn liquid waste. To save energy, the Plant adopted inverter technology for its pump blowers, reviewed operation control systems and took other measures. This led to a lowering of the Plant's unit value added index for energy consumption to 83, taking the figure in 1990 as 100.

To raise employees' awareness of environmental issues, we have instituted a system of segregation of garbage by category of material, taken steps to reduce the use of paper used for photo copies, and have adopted more thorough lighting controls.

To continue to make progress in fiscal 2002, the Plant has made reducing waste disposal and energy consumption a priority. Our targets are to reduce waste by 70% from the fiscal 2001 level, and to lower the unit index for energy consumption by one point.

We realize that environmental laws and regulations will become stricter, so we are required to continuously improve our performance for environmental activities in an upward spiral manner according to the PDCA cycle.

In fiscal 2001, we unfortunately had an accident resulting in personnel leave. We will further conduct risk assessment of work operation and promote other process safety and disaster prevention measures such as fire drills to upgrade safety in all areas of the Plant.



Takuo Goto

Takuo Goto
Manager, Kawasaki Plant

Tochigi Plant 2606 Akabane, Ichikai-machi, Haga-gun, Tochigi 321-3497 Japan

●Description of business

Production of disposable diapers, paper products for cleaning, aroma chemical; fundamental research and research for commercialization

●Environmental burden data

Classification	FY				
	1997	1998	1999	2000	2001
Total production output	55,449	63,859	54,484	63,153	54,992
CO ₂ emission	56,103	58,459	54,292	54,296	52,499
Waste discharged	4,376	5,570	3,998	3,902	3,714
Final disposal for landfill	677	619	526	256	184
SO _x emission	6	6	8	9	18
NO _x emission	268	366	319	300	344
COD emission	2	2	1	1	2

Emission of substances subject to the PRTR law (FY 2001)			
Cabinet order No.	Name of substance	Air	Public water
227	Toluene	2.0	0

(Listed above is the substance subject to the PRTR law whose amount of emission was over 1 ton.)

The Tochigi Plant has made a steady effort since it was established to minimize the burden its activities place on the environment. The Plant received ISO14001 certification on October 8, 1999. Based on "Responsibilities to Society" which is one of the Kao Management Principles, we are implementing a five-point environmental management program.

One result of this effort is that, in fiscal 2001, we were able to raise our waste recycling rate, which included thermal recycling, to 94%. The volume of discharged waste was 7,670 tons, 515 tons lower than the level discharged in 1999. To raise our recycling rate even higher, we are also moving ahead with efforts to recycle ash for use as road bed material.

The Tochigi Plant is located in a rural area, which means we have to pay close attention to water quality. In addition to increasing the greenery at work sites, we are making every effort to reassure residents of the surrounding community that we are doing our utmost to conserve the natural environment.

The Plant is also carrying out an energetic program to save energy. In fiscal 2001, this effort included replacing 3,800 fluorescent lights with energy-saving types. As part of our multifaceted environmental effort, to reduce harmful emission into the atmosphere, we began using solvent burning equipment in July 2000. By doing so, we have reduced discharge of PRTR materials to 5% (1/20) of the former volume.

Along with environmental conservation, occupational safety activity is regarded as a top priority. In fiscal 2001, there were no accidents resulting in personnel leave. We are stepping up our safety and accident prevention activities to maintain this record. This includes a risk assessment program to guarantee the safety of all plant facilities. Plant management feels that these efforts fully complement our comprehensive environmental conservation activities.

The Tochigi Plant will keep its environmental principles uppermost in mind as it carries out daily activities and a steady effort to meet its social responsibilities. We recognize that promoting environmental conservation and safety requires the cooperation of everyone.



Hikotarou Kawaguchi

Hikotarou Kawaguchi
Manager, Tochigi Plant

Kashima Plant 20 Higashi-fukashiba, Kamisu-cho, Kashima-gun, Ibaragi 314-0103 Japan

●Description of business

Production of premium cooking oil, cooking oil, surfactants, fatty chemicals

●Environmental burden data

Classification	FY				
	1997	1998	1999	2000	2001
Total production output	153,764	165,700	156,014	167,302	164,289
CO ₂ emission	99,175	100,754	108,737	109,080	112,699
Waste discharged	5,306	4,575	4,425	3,734	4,686
Final disposal for landfill	74	101	63	89	162
SO _x emission	5	6	12	14	14
NO _x emission	52	59	71	92	78
COD emission	18	17	15	17	14

Emission of substances subject to the PRTR law (FY 2001)

There was no substance subject to the PRTR law whose emission was over 1 ton.

Because effluence containing COD drains to public sewage, data for COD reflects subtraction at the sewage treatment plant based on the subtraction rate.

As a result of the Kashima Plant's environmental conservation efforts, in December 1998, we were the first out of the eight domestic Kao plants to gain ISO14001 certification. With the third year renewal audit completed successfully in fiscal 2001, all employees as a unit will continue to enhance our Environmental Management Systems (EMS) according to the PDCA cycle toward continuous improvement in an upward spiral manner.

Our environmental policy calls for addressing the environmental issues listed below: 1) waste reduction, 2) energy conservation, 3) recycling, 4) moving to a paperless system, 5) pollution prevention. Environmental goals are then set for each area and monitored daily carrying out according to the PDCA cycle.

Final disposal of waste from production has been reduced by switching from incineration to recycling. The final disposal amount has been reduced from the indicator of 100 in fiscal 1990 to the current level of less than 10.

Through system improvements, the introduction of a steam turbine for self-generated power together with the adoption of power inverter systems for pump blowers, the Kashima Plant reduced the indicator for energy conservation to 45 in fiscal 2001, taking the unit value index in 1990 as 100.

In accordance with the PRTR law and based on our goal of eliminating the release of odorous gases into the atmosphere, we are implementing systems to cleanse gas emissions from the incinerators installed when the plant was built.

In addition to placing special emphasis on reducing effluence by improving production processes, during fiscal 2002 we will continue to implement our policy of consideration of the global environment in the manufacture of products.

Regarding process safety and disaster prevention, we were able to post a record of zero accidents resulting in personnel leave in fiscal 2001. We will make every effort to continue this "zero accident" level of achievement. This will include a thorough risk assessment of machinery and equipment and a safety assessment of our chemical plant.



Suehiro Otoru

Suehiro Otoru
Manager, Kashima Plant

Toyohashi Plant 4-51 Akemi-cho, Toyohashi-shi, Aichi 441-8074 Japan

●Description of business

Production of hair color, men's cosmetics, hair care products, Nivea-Kao products, binder for casting

●Environmental burden data

Classification	FY				
	1997	1998	1999	2000	2001
Total production output	39,547	31,784	33,734	39,863	33,447
CO ₂ emission	9,133	9,747	9,344	9,234	9,115
Waste discharged	2,873	5,266	4,237	2,691	2,177
Final disposal for landfill	288	535	128	404	414
SO _x emission	2	1	1	1	2
NO _x emission	37	46	37	33	33
COD emission	<1	<1	<1	<1	<1

Emission of substances subject to the PRTR law (FY 2001)

There was no substance subject to the PRTR law whose emission was over 1 ton.

The Toyohashi Plant, which received ISO14001 certification in December 2000, is carrying out a full-fledged Environmental Management System (EMS) program that focuses on reducing consumption of resources and energy in its production process, reducing waste disposal, and complying with laws and bylaws.

Our main activities include shortening facility operation time, improving effluence treatment capacity, replacing compressors and fluorescent lights with more energy-efficient devices, and even such activity as turning off the lights during lunch hour, and using both sides of photocopy paper. As a result, we achieved a 431-ton reduction of the volume of waste in fiscal 2001 from the previous year (26% less), and we were able to reduce the amount of energy consumption by the equivalent of 90KL of crude oil (2.4% less).

To prevent environmental pollution, we will strengthen such ongoing activities as monitoring gas emissions, effluence and controlling discharge of substances subject to the PRTR law to operate the Plant with less impact on the environment. Specifically, we will make a united effort to achieve targets to decrease the amount of energy consumption to level 56 and the amount of waste generated to level 13 in fiscal 2010, taking the unit value added index in 1990 as 100, respectively.

We recognize safety issues to be a significant component of the Plant's activities along with environmental conservation. In fiscal 2001, we are implementing measures according to a three-pillar motto, "No Trouble, No Error, Error-proof." As a result of a newly introduced system for management of shift workers to strengthen process safety and disaster prevention aspects for night work, the Plant has had no accidents resulting in personnel leave for seven consecutive years. To establish an even more thorough system, we will conduct risk assessment at a model facility and apply the optimum way to all facilities in our Plant. Through this measure for promotion of safety operation, we, all together, are striving to achieve the 10 consecutive year record of no accidents resulting in personnel leave as our next goal.



Norio Takahashi

Norio Takahashi
Manager, Toyohashi Plant

Ehime Sanitary Products Company, Limited 6-3 Hiuchi, Saijo-shi, Ehime 793-0003 Japan

●Description of business

Production of disposable diapers, sanitary napkins, paper cleaning products

●Environmental burden data

Classification	FY				
	1997	1998	1999	2000	2001
Total production output	41,204	39,689	37,131	41,076	35,305
CO ₂ emission	26,383	25,940	25,499	25,357	24,688
Waste discharged	2,575	2,057	1,384	1,225	970
Final disposal for landfill	254	218	180	155	187
SO _x emission	3	4	5	5	5
NO _x emission	144	128	156	152	84
COD emission	-	-	-	-	-

Emission of substances subject to the PRTR law (FY 2001)			
Cabinet order No.	Name of substance	Air	Public water
227	Toluene	2.2	0

(Listed above is the substance subject to the PRTR law whose amount of emission was over 1 ton.)

Ehime Sanitary Products Company, Limited, a Kao Group company, acquired ISO14001 certification in December 1999. Since then, we have achieved continuous improvements in reducing the environmental burden from the company's activities through self audits, inspections by outside verification organizations and Kao Group Responsible Care audits.

Waste reduction efforts have included a review of raw material utilization to minimize waste generated by production processes and improving the recycling rate. As a result, in fiscal 2001, final disposal at off-site landfills was lowered to 37.1% of the fiscal 1990 level. These activities have set the stage for the company to rise to the challenge of "zero-emission." The aim is to slash all industrial waste disposal at off-site landfills to zero.

Environmental conservation efforts in fiscal 2001 included further reduction of the volume of discharged soot and dust by 99% from the level of fiscal 1990. As we instantaneously implemented measures in connection with the PRTR law, emission of subject substances from the printing facilities decreased by 99%. By raising efficiency in the loading of raw materials and products onto trucks, we were able to eliminate approximately 1,200 truck trips per year, cutting CO₂ exhaust gas emission by 160 tons.

Our target for fiscal 2002 is to reduce carbon monoxide (CO) discharged from boiler facilities by 86% from the level of the previous fiscal year. We will also strive to reduce CO₂ and waste materials through activities in which all employees will participate.

In the area of process safety and disaster prevention, we have created a project team to lead the company's efforts to prevent accidents in production activities. The team is conducting activities to identify and repair or upgrade equipment and technology used in the production processes. Concretely, we are conducting a wide range of activities, including improvement of safety covers around machinery and strengthening our disaster-prevention monitoring systems.

We intend to continue with these efforts to do whatever we can to progressively make improvements. Ehime Sanitary Products seeks to be a company that exhibits environmental responsibility both to the earth and people.



Hisatsugi Mitsuyama.

Hisatsugi Mitsuyama
Plant Manager, Ehime Sanitary Products Company, Limited

Terms Used in the Environment, Safety and Health Report 2002

Term	Description
Responsible Care	Responsible Care is generally defined as the "Independent management activities of companies which manufacture or handle chemical substances, that, under the general rules of self-determination and responsibility, aim to conserve the environment, provide safety and health and that incorporate a commitment to the public in their management policy to provide and improve environmental conservation, safety and health over the entire life cycle of chemical products, including the development, manufacture, distribution, consumption, and final disposal of chemical products." The Responsible Care philosophy in Japan was set up by the Japan Chemical Industry Association, and in 1995 the Japan Responsible Care Council (JRCC) was established. Kao has been an active JRCC member since its establishment. As of October 2001, JRCC consists of 109 company members.
PDCA cycle	The Plan, Do, Check and Act (PDCA) cycle is the flow of operations that involves four activities; to plan short- and mid-term goals, to do or conduct activities according to these plans, based on the company's environmental policy to continuously improve environmental conservation activities, then to check the results of these activities, and finally to act to make further improvements. This flow of activities made into a cycle is called PDCA cycle.
Environmental accounting	This is a system to acknowledge, analyze and publish the effects (expressed quantitatively as a monetary or physical unit), achieved as a result of environmental conservation investment and activities within business operations. This aim is for the company to efficiently and effectively promote environmental conservation activities while maintaining a good relationship with society and managing sustainable growth. In March 2002, the Ministry of the Environment issued a guideline to instruct how to compile data for environmental accounting.
ISO 14000 series	This is the abbreviation for the international standard on environmental management systems set by ISO (International Organization for Standardization). Of the 14000 series, ISO 14001 is the standard adopted by many companies. This standard particularly calls on "companies themselves to establish targets and continually work to lower environmental burdens that are caused by their business activities."
Life Cycle Assessment (LCA)	Method to comprehensively analyze and assess the environmental burden during the entire life cycle of products, i.e. procurement of resources, production, consumption, and disposal. Using this method, we specify the input of raw materials and energy, as well as output of harmful substances and waste. This also enables assessment about what kind of environmental impact are loaded.
3Rs	Reduce, Reuse and Recycle. Precisely, it means to reduce the amount of raw materials used and waste disposal, to reuse containers and their functional parts and recycle materials used into raw materials.
The Container and Packaging Recycling Law	A law that was enacted to encourage the reuse of various containers and packaging materials, which make up the majority of household waste in terms of cubic content, as products. It obliges consumer to sort their waste, local authorities to collect waste according to classifications, and manufacturers to recycle waste and use it in products. When the law was initially introduced in 1997, it was limited only to glass and PET bottles. From April 2000, it was fully implemented to include paper and plastic.
Law for Promotion of Effective Utilization of Resources (Revised Waste Management Law)	In addition to recycling efforts, this law aims to promote reduction of waste disposal and reuse of functional parts of products to reduce the amount of materials used. The law went into force in April 2001 as an expanded, organized, and updated version of the Law for the Promotion of Utilization of Recycled Resources.

Term	Description
Co-generation	A system that uses utility gas, which has a low CO ₂ emission level, for power generation and effectively utilizes waste heat generated from power generation to heat residences and plants. This system improves heating efficiency to a large extent.
Unit value added index	Amount of value added production output per unit. Value added production output is the amount of production on a selling price basis, excluding variable manufacturing cost.
Recyclable energy	Sunlight, water power, wind power and other sources of energy that are both abundant on earth and clean with less of a burden on the environment.
Zero emission	To reduce disposable waste from business activities at plants and offices to as near to zero as possible by reusing it as raw materials and a source of heat at the company's own plants or other companies' plants.
SOx, NOx	SOx is a generic term for SO ₂ , SO ₃ or acid mist in sulfur oxide, which is generated from burning chemical fuels containing sulfur. NOx is a generic term for NO or NO ₂ in nitrogenous substance, which is generated from burning fuels.
COD (Chemical Oxygen Demand)	A value to measure organic matter contained in water, into which effluence flows. It indicates the amount of oxygen consumed when an oxidizer (potassium permanganate, potassium bichromate) decomposes organic matter in water. The unit used is mg/L or ppm. The larger the figure, the more organic matter is contained in water, and the higher the level of pollution.
SCM (Supply Management System)	A method that manages business activities from the upper to the lower stream by using computers. All related sections share data, including sales and inventory, in order to achieve optimum procurement, manufacturing and distribution.
PRTR	Abbreviation for Pollutant Release and Transfer Register. It is a system designed to acknowledge and reduce environmental risks by requiring companies to report to the government and publish potentially harmful chemical substances and environmental pollutants that are released and/or transferred by the companies.
MSDS	Abbreviation for Material Safety Data Sheet. To prevent accidents related to chemical products, the MSDS includes data about safety management and is distributed for each product from the supplier to the user or company that handles the products.
Yellow Cards	In case of an emergency during transportation of chemical substances or high pressure gas, the card instructs the driver or other nearby representatives what to do, as well as how first-aid by fire fighters or police should be conducted.
Soy oil ink	This is partially replacing petroleum solvent which is contained in printing ink. It generates less volatile organic compounds (VOC), which can cause air pollution, and is suitable for recycling as it is easily dissolved out of paper.



「環境・安全報告書」第三者検証 意見書

花王 株式会社
取締役社長 後藤 卓也 殿

2002年7月8日

レスポンス・ケア検証センター長

田中 康夫



■検証の目的及び範囲

レスポンス・ケア報告書検証は、花王株式会社が作成した「環境・安全報告書 2002 年版」（以後、報告書と略す）を対象として、下記の検証範囲を検証し、化学業界の専門家の立場から、意見を表明することを目的としています。また、レスポンス・ケア検証センターは、この報告書をレスポンス・ケア活動の実施状況に関する報告書と位置づけしており、本校証により、受審企業のレスポンス・ケア活動のレベル向上に寄与することも目的としています。

2002年度は、本校証制度構築に当たり、パイロット段階と位置付けています。なお、今回は環境会計については対象外としています。

【検証範囲】

- 1) パフォーマンス指標（数値）の算出・集計方法の適切性・合理性、並びに数値の正確性
- 2) パフォーマンス指標（数値）以外の情報の正確性
- 3) レスポンス・ケア活動の評価

■検証の手順

- ・本社において、各サイトから報告されるパフォーマンス指標の集計・集計方法に関する調査、並びに記載情報の事実確認を経営管理層及び作成責任者へのインタビュー、資料提示により実施。
- ・各サイトにおいて、本社に報告するパフォーマンス指標の算出・集計方法並びに数値の正確性に関する調査を各業務責任者へのインタビュー、資料提示により実施。なお、サイトとしては、栃木工場、和歌山工場を選定、パフォーマンス指標の検証についてはサンプリング手法を使用。

■意見

- 1) パフォーマンス指標（数値）の算出・集計方法の適切性・合理性、並びに数値の正確性
 - ・報告書に記載されているパフォーマンス指標は、合理的かつ適切なプロセスにより算出・集計されています。各サイトでの算出・集計に際し使用する様式は統一され、算出方法等も明確に規定されています。
 - ・パフォーマンス指標の数値についても正確であることが確認され、本社とサイト間での数値の整合性に問題はありません。原案段階では、排水の把握範囲が水質汚濁防止法の対象設備に限定されている等の指摘事項も認められましたが、既に修正されており、現在修正すべき重要な事項は、特に認められません。
- 2) パフォーマンス指標（数値）以外の情報の正確性
 - ・報告書に記載された情報は、提示された証拠資料により正確であることが確認されました。
- 3) レスポンス・ケア活動の評価
 - ・RC 推進委員会、全体会議、内部監査と RC 活動の PDCA がきちんと回り、その成果として、CO2 排出量の 90 年比で減少、PRTR 対象物質の排出量の大幅削減等、各種パフォーマンス指標が向上していることを評価します。

以上

Written Opinions Concerning Third Party Verification of “Environment, Safety and Health Report”

To: Mr. Takuya Goto, President & CEO
Kao Corporation

July 8, 2002

Yasuo Tanaka
Chief, Responsible Care Verification Center

■ Purpose and scope of verification

The purpose of verification for the “Environment, Safety and Health Report 2002,” prepared by Kao Corporation (hereafter called “Report”), is to verify the below-mentioned scope of verification and express opinions from the standpoint of experts in the chemical industry. The Responsible Care Verification Center positions this Report as one that specifies performance of the company's Responsible Care activities. Through this verification, the Center also aims to contribute to improvement in the level of the company's Responsible Care activities.

For fiscal 2002, the Center has conducted a provisional third party verification for the development of the verification system. Environmental accounting is not covered in this year's verification.

Scope of verification

- 1) Appropriateness and rationality of methods to calculate and compile performance indices (numeric values), accuracy of numeric values
- 2) Accuracy of information other than performance indices (numeric values)
- 3) Evaluation of Responsible Care activities

■ Verification procedure

- In the company's Head Office, the Center verified methods to compile and edit performance indices reported by each designated plant, and audited whether information in the Report was true, based on documentation presented and interviews with the management and personnel responsible for preparation of the Report.
- In each designated plant of the company, the Center verified accuracy of methods used to calculate and compile performance indices as well as numeric values, which had been reported to the Head Office, based on documentation presented and interviews with personnel responsible for each task. Specific designated plants were the Tochigi Plant and Wakayama Plant. A sampling method was applied for the verification method of performance indices.

■ Opinions

- 1) Appropriateness and rationality of methods used to calculate and compile performance indices (numeric values), accuracy of numeric values
 - The Center confirmed that performance indices in the Report had been calculated and compiled in a rational and appropriate process. Integrated forms are used for calculation and compilation, and the calculation methods are specifically regulated.
 - The Center also confirmed accuracy of the numeric values for performance indices, and the numeric values were consistent between the Head Office and the designated plants. At the preliminary stage, the Center pointed out some insufficient points, including the scope of inspection of effluence, which had been limited to facilities covered by the Clean Water Act. However, they have been all corrected, and we recognized no material issues to be corrected at present.
- 2) Accuracy of information other than performance indices (numeric values)
 - The Center confirmed accuracy of information specified in the Report based on documentation presented.
- 3) Evaluation of Responsible Care activities
 - The Center highly evaluates that the PDCA cycle in the Committee for RC Promotion, general meetings, internal audit, and RC activities were performed well, and each performance index was improved through efforts such as a decrease in CO₂ emission in comparison with the fiscal 1990 index and a remarkable reduction of emission of substances subject to the PRTR law.



Environment, Safety and Health Report 2002

— Kao's Responsible Care —

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Please forward inquiries to:

Headquarters of Environment & Safety

Kao Corporation

1-3, Bunka 2-chome, Sumida-ku,

Tokyo 131-8501 Japan

Tel: +81-3-5630-9089 Fax: +81-3-5630-9343

〈URL〉 http://www.kao.co.jp/e/corp_e/responsible/

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