

Kyowa Hakko Group Health, Safety, and the Environment/Sustainability Report 2002



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FROM THE PRESIDENT

As a corporate citizen dealing with the most crucial issues of what has come to be known as the century of the environment, we are often faced with the issue of sustainability. Businesses are being asked to consider the environmental impact of products throughout their life cycles, from materials procurement to use and final disposal. We at the Kyowa Hakko Group are committed to our corporate philosophy of contributing to the health and well-being of people worldwide by creating new value in the pursuit of advancements in life sciences and technology, thereby encouraging business that is geared toward the realization of an affluent society that functions in harmony with nature. We take pride in providing sustainable products and services that support healthy and enjoyable lifestyles. These include prescription pharmaceuticals—the main pillar of our business—that offer treatments and health enhancement to improve patients' quality of life as well as food products that improve health. Thus, in a way our products and services constitute environmental boons in themselves.

Based on its Management Guidelines for Safety and the Environment, the Kyowa Hakko Group has established a Declaration of the Basic Policies for Health, Safety, the Environment, and Product Safety; Basic Policy on Health, Safety, the Environment, and Product Safety; and Guidelines for Action. This translates into wide-ranging considerations regarding the environment and safety (Responsible Care (RC)) as well as quality assurance that puts top priority on consumer safety as a matter of course in our daily business activities. We are pursuing RC activities—specifically, safety, health, and environmental preservation activities—comprehensively throughout the Kyowa Hakko Group, and the establishment of specific targets as well as our progress in achieving them are outlined in this report. In addition, we are encouraging all in-house Company businesses to conduct Life Cycle Assessments (LCAs) to pinpoint various challenges that will shape policies related to future activities.

Top-level management has taken the initiative in making measures related to health, safety, and the environment its top priority. The scope of these measures grows by the year, and for fiscal 2001, ended March 31, 2002, we are pleased to present consolidated Group information that includes data from both domestic and overseas companies. Our activities are carried out in accordance with voluntary standards that are not only more stringent than either national or local government standards but also continually being strengthened under the Kyowa Eco-Project, a prioritized action plan covering a three-year period. Specifically, we have achieved a 50% reduction in waste disposal at landfill sites compared with fiscal 1998 and a 1% rate of reduction in energy use per year, both of which have contributed to lower production costs. While we have also



achieved significant reductions in our emissions of adverse chemical substances, we recognize that efforts toward further reductions are necessary to satisfy the demands of society.

In fiscal 2002, we carried out a material balance assessment of each of our business units based on LCAs to evaluate emissions of greenhouse gases as well as the energy and resource efficiency of the business units and discussed both product value and its counterpart, the environmental impact of products. Moreover, we are using environmental accounting methods to determine the costs and effects of Groupwide environmental protection measures. Such methods have shown our products from the Chemicals Company to pose a challenge in the area of energy reductions, an issue that we will continue to treat as a priority.

Our business activities also have a community-oriented aspect, and we have included in this report information regarding our efforts to forge a harmonious coexistence with society and local communities, provide science education opportunities for young people, and establish an in-house employee training system. In fiscal 2002, we aim to boost Groupwide activities as well as disclosure and implement ISO management systems even at companies with which our capital affiliations are only loose, in this endeavor encouraging efficient action to further business activities that live up to the trust that society puts in the Kyowa Hakko Group.

September 2002

A handwritten signature in black ink that reads "Tadashi Hirata". The signature is fluid and cursive, written in a professional style.

Dr. Tadashi Hirata
President
Kyowa Hakko Kogyo Co., Ltd.

BASIS FOR REPORTING AND SCOPE OF THIS REPORT

The Kyowa Hakko Group's *Health, Safety, and the Environment/Sustainability Report 2002* primarily concerns the fiscal 2001 performance of Kyowa Hakko, Kyowa Yuka Co., Ltd., and Kyowa Medex Co., Ltd., as well as the Group's domestic consolidated production bases.

This report was created in accordance with RC codes as well as Japan's Ministry of the Environment's guidelines for environmental reports and includes information required by Global Reporting Initiative sustainability reporting guidelines.

The aim of this report is to clarify the Kyowa Hakko Group's impact on the environment. This report covers Kyowa Hakko Group business in several industries—pharmaceuticals, chemicals, bio-chemicals, food, and liquor and alcohol—and has analyzed the environmental impact of its operations in each based on LCAs.

The scope of the collection and publication of environmental impact and related data in this report encompasses the domestic production, research, and sales sites shown below and encompasses the Kyowa Hakko Group's environmental protection activities in fiscal 2001. Certain data regarding results in fiscal 2002 have also been included.

In the interest of maintaining consistency with previous reports, information regarding our three overseas production bases has been collected separately and included in this report.

Plants•Kyowa Hakko

- ① Tsuchiura ② Fuji ③ Sakai
- ④ Hofu ⑤ Ube ⑥ Moji*

Principal Consolidated Production Bases

- ⑦ Kyowa Yuka Co., Ltd. (Chiba)
- ⑧ Kyowa Yuka Co., Ltd. (Yokkaichi)
- ⑨ Kyowa Medex Co., Ltd. (Fuji)

Other Consolidated Production Bases

- ⑩ Ohland Foods Co., Ltd. (Chiba)
- ⑪ Ohland Foods Co., Ltd. (Tsuchiura)
- ⑫ Kyowa Hifoods Co., Ltd. (Ube)
- ⑬ Riken Kagaku Co., Ltd. (Itabashi)
- ⑭ Kyowa F.D. Foods Co., Ltd. (Hofu)
- ⑮ Asahi Foods Products Co., Ltd. (Shizuoka)
- ⑯ Saint Neige Wine Co., Ltd. (Yamanashi)*

Research Establishments

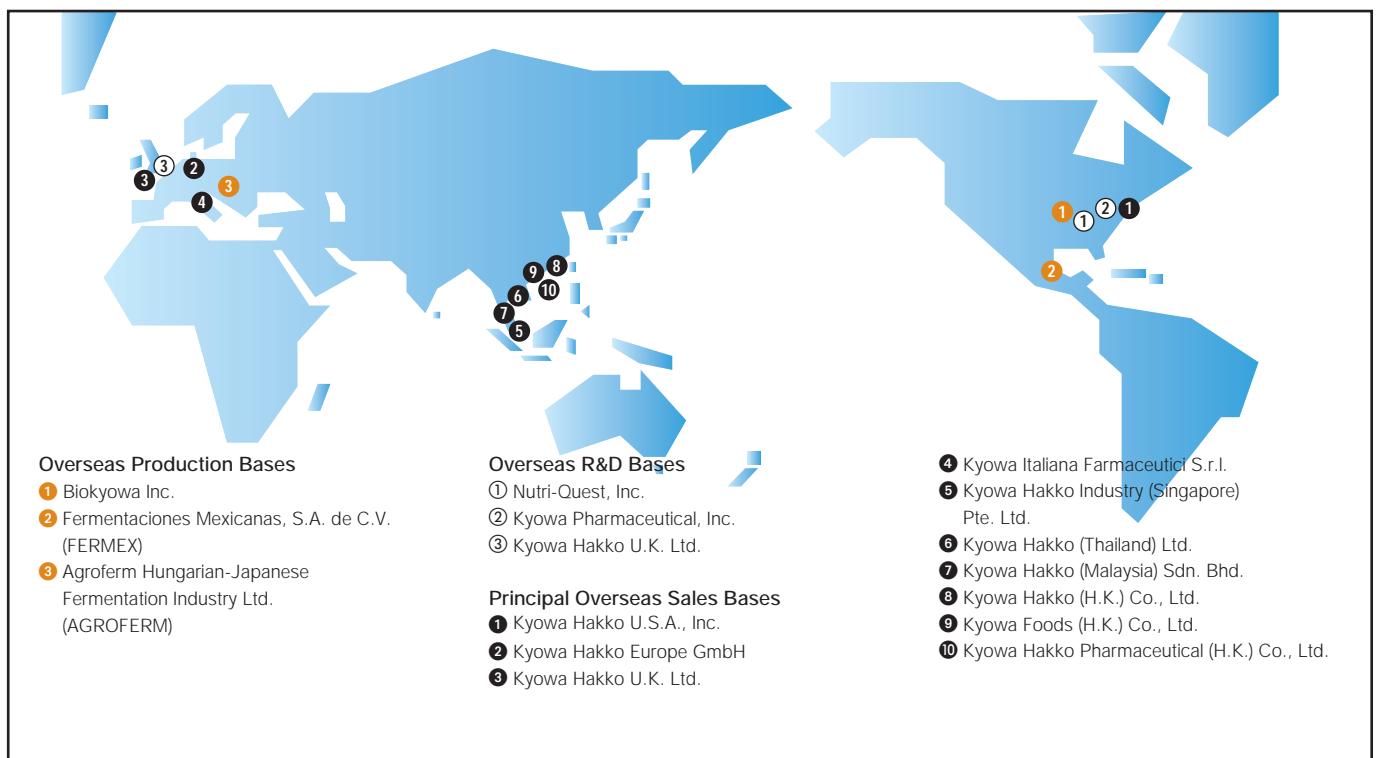
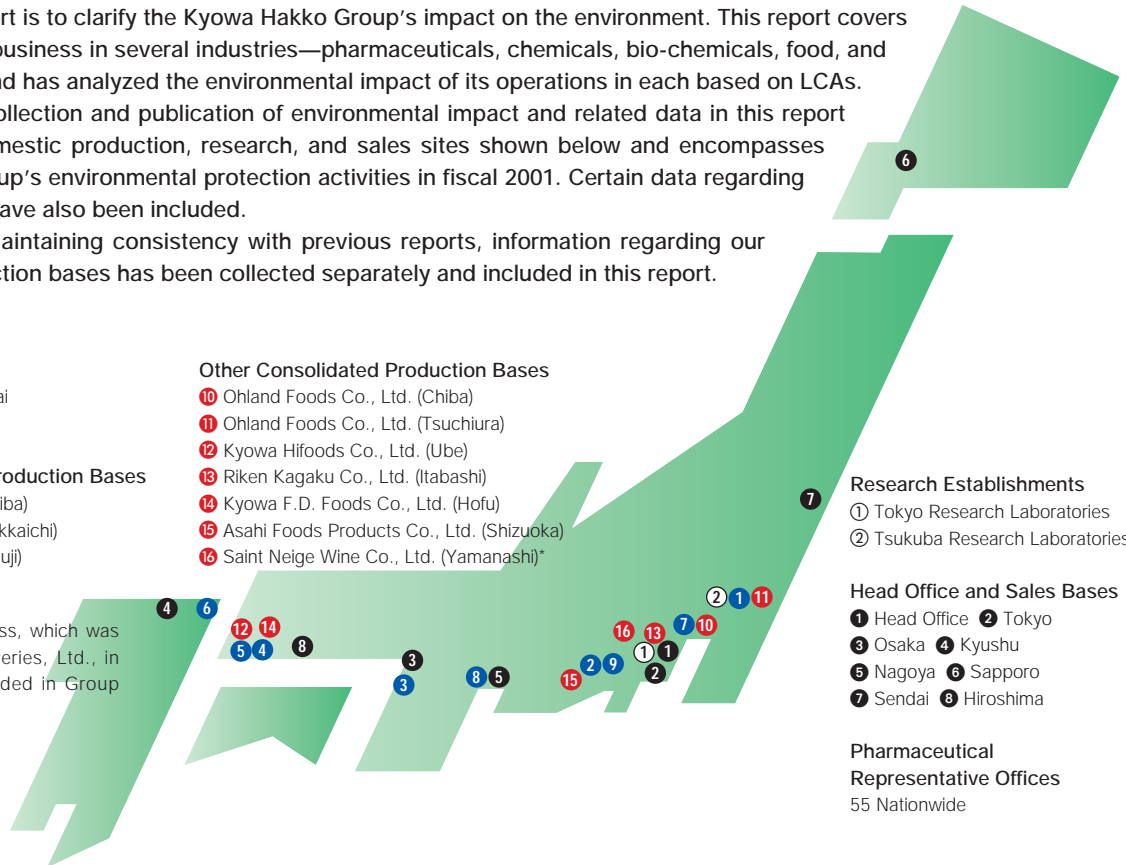
- ① Tokyo Research Laboratories
- ② Tsukuba Research Laboratories

Head Office and Sales Bases

- ① Head Office ② Tokyo
- ③ Osaka ④ Kyushu
- ⑤ Nagoya ⑥ Sapporo
- ⑦ Sendai ⑧ Hiroshima

Pharmaceutical Representative Offices
55 Nationwide

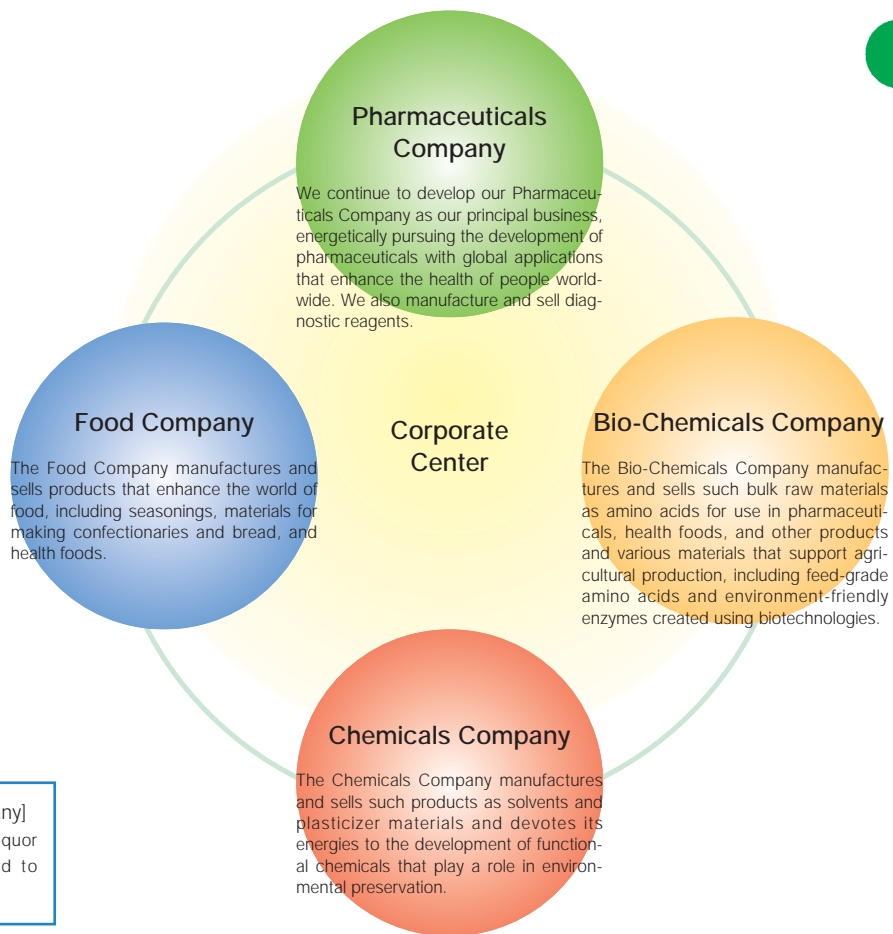
*Data for the Liquor Business, which was transferred to Asahi Breweries, Ltd., in September 2002, is included in Group information in this report.



THE KYOWA HAKKO GROUP'S BUSINESS ACTIVITIES

Corporate Philosophy

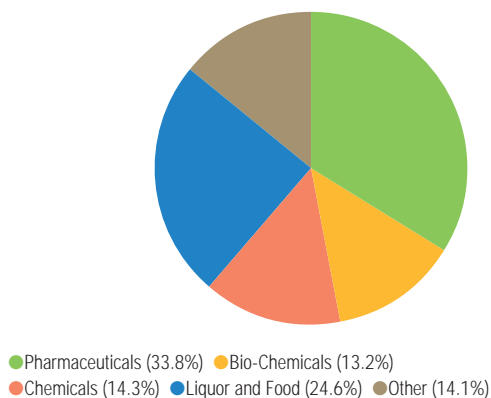
Kyowa Hakko will contribute to the health and well-being of people worldwide by creating new value in the pursuit of advancements in life sciences and technology. (Amended in 1999)



[Liquor & Alcohol Company]
In September 2002, the Liquor Business was transferred to Asahi Breweries, Ltd.

Company Profile (On a consolidated basis)

Fiscal 2001 Net Sales by Segment



Net Sales and Net Income
(Years ended March 31)



Paid-in Capital ¥26,745 million (At March 31, 2002)
 Number of Employees 7,299 (At March 31, 2002)
 Established..... July 1, 1949

MANAGEMENT GUIDELINES FOR SAFETY AND THE ENVIRONMENT

Kyowa Hakko has drafted seven management guidelines (effective March 1999) based on its Corporate Philosophy (p. 3) that bear on operations; its relationships with customers, shareholders, and employees as well as society; its corporate ethics; and the environment and safety. These policies are partially outlined in various sections, including our Social Performance Report (pp. 14, 17, 20).

Management Guidelines for Safety and the Environment

"Work to protect the environment and maintain safety and also provide products with consideration of the environment and safety." (Introduced in March 1999)

Declaration of the Basic Policies for Health, Safety, the Environment, and Product Safety

We declare that, in accordance with the "Basic Policies for Health, Safety, the Environment, and Product Safety,"* we will carry out Responsible Care (RC)** activities extensively to preserve health, safety, and the environment as well as step up quality assurance to ensure the safety of consumers in our daily business activities.

**Responsible Care (RC) is a set of self-management principles according to which business operators engaged in the manufacture or handling of chemical substances make a commitment to following stringent management guidelines. These guidelines are aimed at preserving the environment and ensuring safety at all stages of chemical substance life cycles, from development and manufacturing to distribution, use, final consumption, and disposal. RC also calls for the implementation of measures to make improvements in areas related to health, safety, and the environment based on the principle of individual responsibility.



Responsible Care

*Our fundamental thinking and specific initiatives regarding these policies are outlined below in "Basic Policy" and "Guidelines for Action." (Declared in April 1996)

Basic Policy on Health, Safety, the Environment, and Product Safety

Kyowa Hakko's policy formulated at its establishment is to "contribute to the health and well-being of people worldwide by creating new value with the pursuit of advancements of life science and technology." Based on this policy, we will exert ourselves to realize an affluent society by conducting business activities with scientific consideration for health, safety, the environment, and product safety throughout the whole life cycles of our products, from research and development through production, marketing, use, and disposal, as well as by making efforts to ensure the quality and safety of our products, taking the safety of consumers as a matter of the greatest importance.

Guidelines for Action

As our first rule, we should strictly control ourselves with profound respect for all living things and with modesty toward science, prove ourselves worthy of public confidence, and contribute to the growth of a healthy and affluent society. Therefore, we should advance our business activities under the following principles, with the protection of human beings and the environment, as well as the safety of consumers, as our first consideration.

- 1) Along with the establishment of the basic policies and control systems for health, safety, the environment, and product safety as our highest principles in the management of Kyowa Hakko, we strive to enhance our employees' consciousness of health, safety, the environment, and product safety by making these principles generally known to them and to advance our activities under these principles from a global standpoint.
- 2) We observe international regulations, as well as domestic laws, rules, regulations, and agreements relevant to health, safety, the environment, and product safety, in cooperation with relevant foreign and domestic agencies and organizations and make efforts to raise our level of control over these principles by observing our self-imposed control standards and utilizing auditing systems.
- 3) Together with our efforts to ensure the safety of our business activities and to reduce negative impact on the environment, we strive to ensure the quality of health, safety, the environment, and product safety throughout the whole life cycles of our products by engaging in overseeing the purchase of raw materials; the production, transportation, and sale of products; and the use and disposal of products by our consumers.
- 4) We carry out assessments of health, safety, the environment, and product safety prior to the development of new technologies and products, the transfer of technologies, and the start of novel businesses. These assessments enable us to ensure our products meet the highest standards with respect to such technologies throughout the whole life cycles of such products commencing in the planning stage.
- 5) We contribute to health, safety, the environment, and product safety on a global scale by working actively toward the development of "earth-friendly" technologies and products as well as toward the development of energy-conservation and resource-conservation technologies.
- 6) We concentrate our efforts on research and development to keep abreast of scientific progress, and we strive to strictly assure the usefulness and safety of our products.

(Introduced in January 1996)

Internal Environmental Regulations

Safety and Environment Basic Regulations	Effective from October 1995	Amended September 1999
Regulations for Environmental Technology and Product Development	Effective from April 1994	Amended June 1999
Safety Management Regulations	Effective from May 1975	Amended July 1999
Environmental Management Regulations	Effective from March 1976	Amended July 1999
Manual for emergencies (<i>Kyowa Hakko Risk Management</i>)	Drawn up April 1986	Amended March 2002
Major Disaster Measures Department Regulations	Effective May 1995	Amended April 2002

"Kyowa Hakko Ethical Principles" and "Kyowa Hakko Codes of Ethical Conduct for Employees" Effective from January 1999

REVIEW OF THE ENVIRONMENT AND SAFETY IN FISCAL 2001

The Kyowa Hakko Group has pursued a wide range of environment- and safety-related activities in accordance with RC practices under the Management Guidelines for Safety and the Environment. Here, I would like to present our progress toward reaching the targets of our fiscal 2001 action plan as well as the results of our activities.

1) Expansion of Environmental Management Systems

Kyowa Hakko, Kyowa Yuka, and Kyowa Medex, our three key businesses, have acquired ISO certification and are advancing RC initiatives. We plan to establish ISO 14001 environmental management systems for consolidated subsidiaries by 2004 and are supporting the establishment of such systems at non-consolidated subsidiaries and affiliates in our aim to expand these systems.

Category	Company	ISO 14001	Publication of Relevant Data
Three principal companies	Kyowa Hakko, Kyowa Yuka, Kyowa Medex	Certification acquired	This report
Consolidated subsidiaries	Ohland Foods Co., Ltd.; Kyowa Hifoods Co., Ltd.; Riken Kagaku Co., Ltd.; Kyowa F.D. Foods Co., Ltd.; Asahi Foods Products Co., Ltd.; Sainte Neige Wine Co., Ltd. (Transferred to Asahi Breweries, Ltd., in September 2002)	Currently in the process of establishing a system	
Non-consolidated subsidiaries and affiliates	Kyowa Iryo Kaihatsu Co., Ltd., Houmi Foods Co., Ltd., Zenmi Foods Co., Ltd.	Supporting system establishment	Unpublished

2) Continuous Improvements in Performance

We have achieved targets set out in the Kyowa Eco-Project, which lays out initiatives to deal with the challenges of waste and energy saving. We reached our fiscal 2004 target for emissions of adverse air pollutants by fiscal 2001, three years ahead of schedule, while we greatly exceeded targets for NO_x emissions. We were also able to reduce nitrogen levels in wastewater compared with the previous fiscal year.

Kyowa Hakko, Kyowa Yuka, and Kyowa Medex achieved a clean track record regarding labor/work accidents with absence, a performance that put them at the top in the chemical industry. Kyowa Yuka, in particular, has achieved a record 20.0 million man-hours (since 1977) of accident-free operations at its Yokkaichi Plant, which continues to operate without incident. We did not experience any safety-related accidents in the period under review.

3) Environmental Considerations throughout the Entire Product Life Cycle

We have decided to expand the number of our assessments of environmental considerations and have established Chemical Substance Management Guidelines, working in cooperation with business partners to advance consideration of the environment. Moreover, we are striving toward further internal risk reduction through such initiatives as employing raw materials that are highly safe and have minimal environmental impact. Having established Guidelines for Environment-Friendly Packaging Materials we are working toward heightened

environmental considerations in the use of packaging materials. Furthermore, we have endeavored to carry out LCAs of the environmental impact of each of our businesses in cooperation with an official research institute, thereby noting the environmental capabilities of and potential challenges confronting each in-house company.



4) Environmental and Safety Assessments

We have revised the regulations related to our environmental and safety assessments to create a more highly sophisticated assessment system and have fortified environment- and safety-related activities in the areas of new businesses and production process changes.

5) Development of Environment-Friendly Technologies

By implementing highly efficient on-site wastewater processing and introducing energy-saving distillation columns and products as well as manufacturing technologies that do not utilize dichloromethane, we are saving energy while reducing waste output. In addition, we are extending the use of these technologies to other companies and expanding our use of such environment-friendly products as phytase and a cross-linkable monomer for waterborne coatings.

6) Safety and Usefulness of Products

We have bolstered our prescription pharmaceutical information system by enhancing the communication of network information in the Pharmaceuticals Company and establishing a Customer Information Center for inquiries regarding medicines. In our Chemicals Company, we have teamed up with the Organization for Economic Cooperation & Development (OECD) to carry out safety assessments and have published a report on safety assessment activities related to high-production volume (HPV) chemical substances.

For further details, please see Action Plan and Performance.

September 2002

Toyokatsu Munakata

Toyokatsu Munakata
Director,

Corporate Safety and Environmental Management Department,
Quality Assurance Department
Kyowa Hakko Kogyo Co., Ltd.

ACTION PLAN AND PERFORMANCE

Action Policy	Initiative		Target
Guideline for Action 1) Expand the application of environmental management systems	• Establishment of ISO 14001 environmental management system	Three principal companies	Certification acquired by all 9 plants (Kyowa Medex certified in 2001)
		Consolidated subsidiaries	Establishment of ISO 14001 system by fiscal 2004
	• Establishment of Occupational Safety and Health Management System (OSHMS)		Establishment of OSHMS by fiscal 2002
	• Audits of consolidated and non-consolidated subsidiaries		Engage in audits of 75% of Group companies annually
Guideline for Action 2) Continuously improve performance	[Production and R&D]		
	• Unit energy consumption		3% improvement in fiscal 2001 from fiscal 1998 levels CO ₂ emissions
	• Waste	Volume of waste materials	50% reduction in fiscal 2004 from fiscal 1998 levels
		Volume of waste disposal at landfill sites	50% reduction in fiscal 2001 from fiscal 1998 levels
	• Emissions of adverse air pollutants		95% reduction in fiscal 2004 from fiscal 1996 levels
	• Atmosphere	SO _x emissions	2,685 tons* ²
		NO _x emissions	825 tons* ² , 20% reduction in fiscal 2001 from fiscal 1998 levels
		Dust emissions	354 tons* ²
	• Water quality	Fresh water usage volume	—
		COD levels	1,642 tons* ³
		Nitrogen levels	1,614 tons* ³
		Phosphorous levels	86 tons* ³
	• Disasters, accidents		Record no labor/work or environment- or safety-related accidents
	• Distribution environment and safety		Rationalization of distribution, assurance of environment-friendly and safe distribution
	• Online system for environment-related information		Completion, operation of system within 2002
	[Administration]		
• Power and resource saving	Ascertain power usage volume, set targets		
	100% use of recycled paper, set targets		
Guideline for Action 3) Consider the environment throughout the entire product life cycle	• LCA/Material balance		Transparency in material balance at each in-house company
	• Green procurement		Implementation of environmental consideration inquiries at business partner companies
	• Packaging materials		Establish Guidelines for Environment-Friendly Packaging Materials
Guideline for Action 4) Upgrade environmental and safety assessments	• Thorough environmental and safety assessment system		Revision and implementation of Safety and Environmental Assessment Regulations
Guideline for Action 5) Develop new products and technologies	• Environment-friendly technology and product development		Realization of development of technologies, products
Guideline for Action 6) Provide safe and useful products	• Assurance of consumer safety and product user-friendliness		Enhanced disclosure of product information

*1 Index based on production value that compares unit emissions with domestic average as follows:

• Air-pollution, waste index = [Total emissions by the Kyowa Hakko Group / Total emissions in Japan] / [Total production value by the Kyowa Hakko Group / Japan's net domestic product]
SO_x, NO_x, dust emissions volume: General Survey of Fiscal 1998 Air Pollutant Emissions (Ministry of the Environment)

Waste emissions volume, landfill volume: Industrial waste volume, treatment status in fiscal 1999 (January 25, 2002, report from the Ministry of the Environment)

Net domestic product: Statistical data (Economic and Social Research Institute, Cabinet Office, Government of Japan)

• Water pollution index = [Total emissions by the Kyowa Hakko Group / Total emissions into closed bodies of water] / [Total production value of Kyowa Hakko Group / Net domestic product of prefectures surrounding closed bodies of water]

COD, nitrogen, phosphorous: Volume occurring in fiscal 1999 in regions targeted by water regulations (*Fiscal 2002 Environmental Statistics Book*, edited by the Ministry of the Environment)

Net domestic product of prefectures surrounding closed bodies of water: Fiscal 1999 Prefectural Economic Accounts (Economic and Social Research Institute, Cabinet Office, Government of Japan)

◎: Achieved target ○: Improved, but did not achieve target

Fiscal 2001 Performance (Status of Progress)	Evaluation	Index*1	Page	Medium-Term Target, New Target
Kyowa Medex acquired certification, all 9 plants certified	◎	—	9	Implementation of environmental activities assessment
Of 7 companies and 16 business sites, 4 business sites have completed certification while 7 companies and 12 business sites are currently constructing systems	○	—	9	Maintain same target
OSHMS focusing on risk assessments nearly completed	○	—	9	Implementation of safety activities assessments
Engaged in audits of 85% of companies, began audits of overseas companies	◎	—	9	Implementation of safety and environmental activities assessments
3.6% improvement from fiscal 2000 levels 708,000 ton, 1.2% reduction from fiscal 1998 levels	◎	— 0.88	26	Average reduction in unit energy consumption of 1% or higher Achieve fiscal 2010 CO ₂ emissions on par with fiscal 1990 levels
204,000 ton, 36% reduction from fiscal 1998 levels	◎	0.75	28	Implementation of point-of-release measures
1,949 ton, 53% reduction from fiscal 1998 levels	◎	0.057		Achievement of zero emissions by fiscal 2007
18.7 ton, 95.5% reduction from fiscal 1996 levels	◎	—	30	97% reduction by fiscal 2004 from 1996 levels
1,176 ton, 9% reduction from the previous year's levels	◎	2.6	27	Establishment of medium-term plan aimed at decreases, ongoing reductions
611 ton, 30% reduction from fiscal 1998 levels	◎	1.0		Improve maintenance of facilities, ongoing reductions
39 ton, 11% reduction from previous year's levels	◎	0.60		Improve maintenance of facilities, ongoing reductions
60.3 million ton reduction	—	3.3	27	Ongoing rationalization of water use
1,235 ton, 1% reduction from the previous year's levels	◎	2.9		Source solutions
807 ton, 11% reduction from the previous year's levels	◎	2.2		Source solutions
33.7 ton, 3% reduction from the previous year's levels	◎	1.2		Source solutions
Recorded no labor/work accidents with absence at 3 principal companies, 3 accidents at consolidated subsidiaries, and no environment or safety-related accidents	○	—	13	No labor/work accidents, no environmental or safety related-accidents
Reduced fuel usage 1% by rationalizing distribution and introducing Eco-tankers	◎	—	12	Rationalization of distribution, ensure environmental safety in distribution
Completed system, commenced operations in April 2002	◎	—	9	Dedicated use as a means of reducing environmental impact
Established target of 1% reduction in energy use per year, achieved 0.5% reduction from fiscal 2000	◎	—	9	1% reduction in electricity use per year
Achieved target of 100% use of recycled paper at sales bases, achieved 7% reduction in copy paper use	◎	—		5% reduction in copy paper use per year
Evaluations carried out in cooperation with government research institute, disclosed in this report	◎	—	24	Ongoing business assessments through LCA/material balance assessments
Introduction of stricter environmental management assessments at business partner companies	○	—	10	Improve environment-friendly activities with business partners
Creation and implementation of packaging material guidelines	◎	—	34	Continuance of activities (thorough guidelines, promotion of streamlined packaging)
Revision and implementation of Safety and Environmental Assessment Regulations	○	—	11	Periodic updating of assessment process
Establishment of production processes that do not use dichloromethane Development of wastewater treatment and energy-saving technologies	◎	—	30	Development of environmental business outside of Company
Enhancement of network information Establishment of Customer Information Center for inquiries regarding medicines and other medical information systems Participation in OECD's HPV Chemicals Programme, which includes safety assessment activities for chemical substances	◎	—	11,19	Continuance of activities

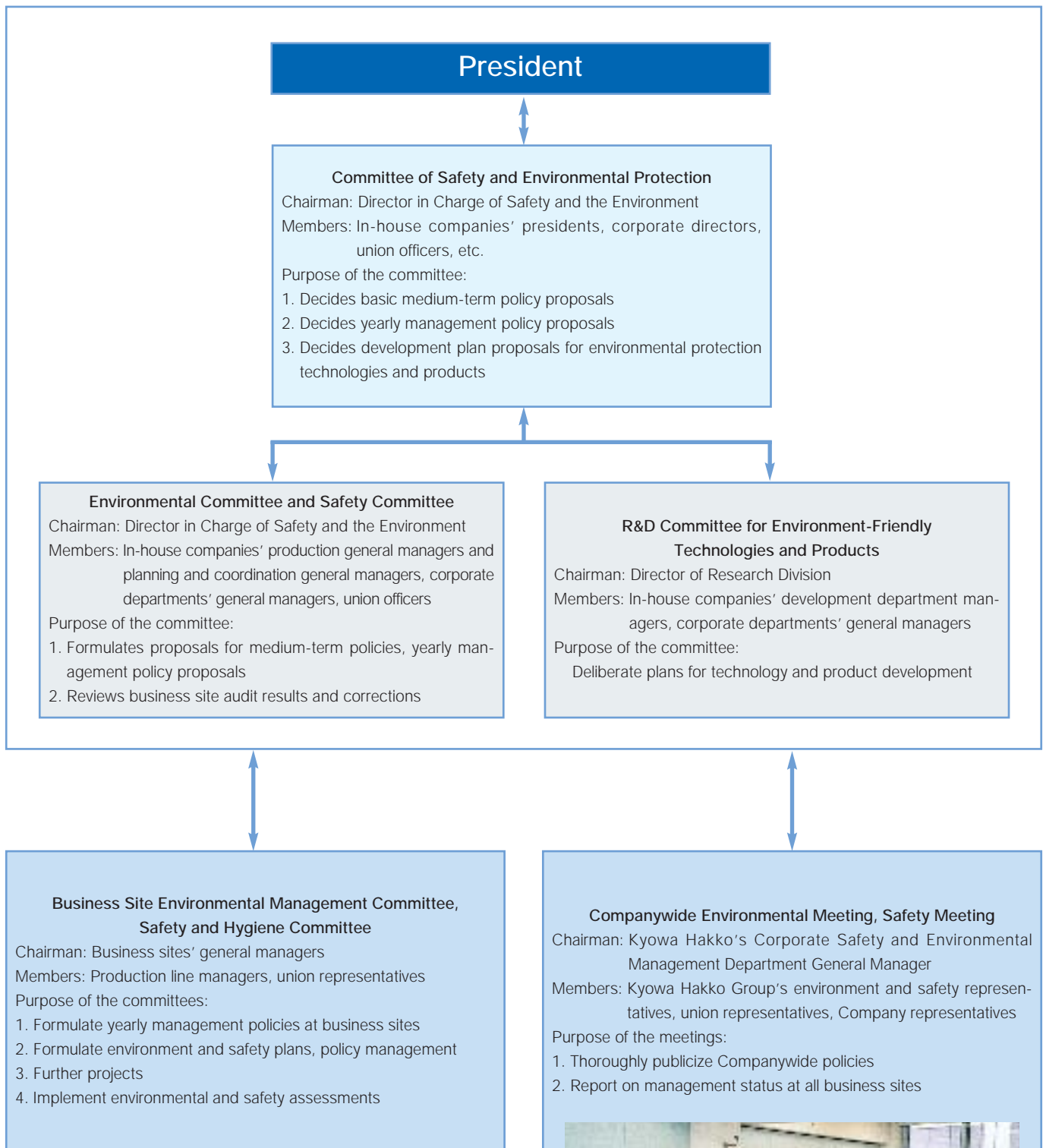
* Fresh water usage volume index = [Kyowa Hakko Group's total usage volume / Japan's total usage volume] / [Kyowa Hakko Group's total production value / Japan's net domestic product]
Fresh water usage volume: Fiscal 1998 domestic non-commercial water + industrial water fresh water replacement volume
(Data: Water Resources Department, Ministry of Land, Infrastructure and Transport)

*2 50% of the legal limit

*3 50% of agreement levels

ENVIRONMENTAL AND SAFETY MANAGEMENT SYSTEM

● Environmental and Safety Management Organization



Companywide environmental meeting

● Management System

1) Environmental Management System ISO 14001

To further RC activities based on the ISO 14001 environmental management system, the Group's three principal companies—Kyowa Hakko, Kyowa Yuka, and Kyowa Medex—have acquired ISO 14001 certification. Our two independent research institutes have also established ISO 14001 systems, expanding RC activities.

Consolidated and non-consolidated subsidiaries and affiliates have established schedules for the implementation of ISO 14001 systems, and efforts to this end are already under way. We are currently moving forward with measures aimed at acquiring certification while setting up systems.

2) Activities Aiming for a Common Target

Environmental policies that are being undertaken by the entire Kyowa Hakko Group are listed below.

Activity	Actions	Fiscal 2001 Performance	New Target
Kyowa Eco-Project	Promotion of projects while pursuing energy-saving and waste reduction targets Targets: 3% or greater improvement in the energy consumption rate (2001/1998) 50% reduction in volume of waste disposal at landfill sites (2001/1998) Creation of online system for environmental information	3.6% improvement 53% reduction In operation from 2002	Improvement in energy consumption rate of 1% per year Elimination of emissions by fiscal 2007 Dedicated use as a means of reducing environmental impact CO ₂ emissions at or below 1990 levels by fiscal 2010
Green Office Plan	Cultivation of environmental awareness at each business base in the Kyowa Hakko Group Targets: Resource saving, reduction in volume of copy paper usage Electric power saving, survey of volume of electric power usage and establishment of targets for it Procurement of recycled paper and eco-mark products	7% reduction from previous year 0.5% reduction from previous year 100% use of recycled paper	5% reduction in copy paper use per year 1% reduction in electricity use per year
Green Procurement	Communication with business partners regarding the Kyowa Hakko Group's environmental policies and chemical substance management policies	157 companies, both domestically and overseas (94% of the value of total procurement)	

3) Occupational Safety and Health Management System (OSHMS)

We are currently setting up an OSHMS based on the new occupational safety and health management policies of the Ministry of Health, Labour and Welfare and the Japan Chemical Industry Association (JCIA). To enhance risk management, one

ISO 14001 Certified Business Sites

Year of Certification	Business Site
FY1999	Kyowa Hakko (Hofu)
FY2000	Kyowa Hakko (Tsuchiura, Fuji, Ube, Sakai, Moji), Kyowa Yuka (Yokkaichi, Chiba)
FY2001	Kyowa Medex (Fuji)

Consolidated and Non-consolidated Subsidiaries Certified with Kyowa Hakko and Kyowa Yuka Business Sites

Chiyoda Kaihatsu Co., Ltd. (Fuji, Moji, Chiba), Kyowa Fine (Yokkaichi)
--

of the pillars of OSHMS, we conduct in-house training for risk management methods laid out by ISO 12100 standards and machine safety package regulations at consolidated and non-consolidated subsidiaries as well as affiliated companies.

● Environmental and Safety Auditing

The Kyowa Hakko Group's environmental and safety audits included an in-house audit conducted by Kyowa Hakko's head office as well as third-party and in-house audits based on ISO 14001 standards.

The results of the audits are reported to general managers of business sites, in-house company presidents, and the presidents of the consolidated and non-consolidated companies concerned, after which the necessary improvements are made.

ENVIRONMENTAL AND SAFETY MANAGEMENT SYSTEM

In fiscal 2001, we conducted audits of Kyowa Hakko as well as the 17 business sites of its consolidated and non-consolidated subsidiaries (85% of the Group). The principal results of the

Environmental Audit Results

Stepped-up efforts to recycle waste (Ube)
Optimum operations of wastewater processing equipment (Fuji, Moji)
Improved management of shared wastewater treatment plant (Chiba)
Conducted audit of industrial waste processing plant (consolidated subsidiaries, affiliates)

audits are outlined below. The Kyowa Hakko Group was found to be in compliance with all environment- and safety-related laws and regulations.

Safety Audit Results

Improved method for verifying construction worker qualifications (Chiba, Sakai)
Improved change management (Fuji)
Safety assurance of on-site distribution (Moji)
Adherence to rules, efficient use (consolidated subsidiaries)

● Safety and Environmental Education

To maintain and improve the level of its environmental protection activities and with the aim of ensuring safety, the Kyowa Hakko Group has established Safety and Environmental Education and Training Standards, in accordance with which it conducts

environment and safety training for its employees. Each business site has established its own regulations to supplement the Group standards. We encourage education at consolidated and non-consolidated subsidiaries as well as affiliates.

Types of Education and Principal Activities

Educational Activity	Environment	Safety and Security	Chemical Substances
Management Training	Environmental and safety management policy, RC implementation plan, yearly environmental and safety policy		
	Corporate management and environmental preservation Latest environmental information	Corporate management and safety and health Latest safety and health information Obligation to maintain safety awareness	Total chemical substance management Latest information about chemical substances
Education of On-Site Managers	Environmental and safety management policy, RC implementation plan, yearly environmental and safety policy		
	Applicable environmental laws and regulations Environmental assessment methods In-house auditor education	Applicable security laws and regulations Risk management methods Manager education Intrinsic safety education	Applicable chemical substance laws and regulations Risk management for chemical substances
Employee Education	Environmental risks of operations Emergency measures Environmental awareness education	Safety awareness education Emergency measures Risk management methods	Chemical hazards Emergency measures MSDS education



Accident-prevention training



Management training

● Environmental and Safety and Product Safety Assessments

1) Environmental and Safety Assessments

To ensure minimal environmental impact and the utmost safety at Kyowa Hakko Group business sites, we carry out safety and environmental assessments (SEAs) before commencing operations at new business sites or upgrading major production facilities. The SEA system serves as a crucial set of standards in making decisions for the establishment of new businesses and pinpoints both the benefits as well as the effects on the environment of services or products offered by new businesses.

2) Product Safety Assessment

① Toward Product Safety

Kyowa Hakko Group recognizes that maintaining product safety is fundamental to quality assurance and one of the most important and fundamental aspects of business. To ensure high product quality and the safety entailed therein, each of our plants uses an optimal quality management system, applying Good Management Practices (GMP) to pharmaceutical production, Hazard Analysis Critical Control Point (HACCP) to liquor and food production, and standard quality management systems that are based on ISO 9001/2 certification (Kyowa Medex—Fuji, Chiba, Yokkaichi, Hofu, Ube, Moji plants).



EU (EN46001) certification by TÜV Rheinland of an analyzer manufactured and sold by Kyowa Medex

When a new product is developed or materials or processes are changed, a quality assessment system or strict in-house change management system is implemented and, based on the results provided by such systems, safety research and evaluations are carried out to guarantee that products supplied to customers boast the highest levels of safety.

② Chemical Substance Safety Evaluation

The OECD is conducting safety evaluations of chemical substances. Kyowa Hakko conducts safety evaluations of its products in cooperation with the JCIA and the Japan Plasticizer Industry Association (JPIA). Kyowa Hakko participates in the International Council of Chemical Associations (ICCA) initiative's HPV Chemicals Programme and have produced an evaluation report for one product as the leading company.

Kyowa Hakko has established an in-house project team to deal with the issue of diethylhexyl phthalate (DEHP) and diisononyl phthalate (DINP), which have become the subject of debate for being endocrine disruptors. To respond to this problem, Kyowa Hakko has established an in-house project team that gathers related information and measurement studies of estrogen activity and reports the results of safety tests.

Regarding DINP, Kyowa Hakko independently commissioned the U.K.-based contract research organization Huntingdon Life Sciences Limited to perform tests on DINP using primates (marmosets), and these tests confirmed that the likelihood of any problem being caused by DINP was low. The results of these tests* were published in a toxicology journal and used in 2000 as crucial safety evaluation data in the United States and Europe.

*Hall, M., et al, *J. Tox. Sci.* 24 237 (1999)

③ Product Safety Information

The Kyowa Hakko Group provides its customers with material safety data sheets (MSDSs) for substances that are regulated by the Industrial Safety and Health Law as well as other laws as part of its environmental protection efforts. Furthermore, the Group provides MSDSs for amino acids, enzymes, bulk pharmaceuticals, and other substances not regulated by the Occupational Safety and Health Law to enhance its customers' product knowledge.

ENVIRONMENTAL AND SAFETY MANAGEMENT SYSTEM

● Environmental and Safety Risk Management

1) Disaster and Societal Risk Assessment

To ensure that we are prepared and able to quickly respond in the event of a major earthquake, fire, or explosion, or if an environmental problem or other disaster were to occur, we have established Emergency Response Standards that have been circulated throughout Kyowa Hakko. Furthermore, we have created a risk management manual, *Kyowa Hakko Risk Management*, that provides guidelines for responding to complaints related to our products, employee misconduct, criminal acts from outside sources, and emergencies at overseas and affiliated companies, thus ensuring thorough risk management throughout the Kyowa Hakko Group.

2) Major Earthquakes

The Kyowa Hakko Group complies with all earthquake provisions, has decentralized production and distribution operations, and has quake-proofed its buildings as part of its measures—reviewed periodically—to prepare for serious earthquakes.



Building reinforcement for earthquake resistance



Anchoring of equipment

3) Environmental Safety in Distribution

To ensure safety in the large-scale distribution of multipurpose products, including chemicals and alcohol products, we have established a 24-hour-a-day emergency contact system. In addition, we have adopted a yellow card system and are advancing efforts to educate people involved in transport operations.

In the rationalization of distribution, we are pursuing shared delivery with trucks and other vehicles. The Chemicals Company is engaged in modal shifts, which include the use of Japan Railway containers, and has reduced its fuel usage for chemical shipments 1.3%.

In addition, in fiscal 2002, we introduced the electrically propelled chemical tanker (Eco-tanker) for the shipment of chemicals, which boasts a 20% reduction in fuel consumption.



The Eco-tanker



Yellow card education

4) Monitoring of Soil and Groundwater

In keeping with the Soil Pollution Measures Law we are working to construct an assessment system. In the past, the Kyowa Hakko Group conducted ongoing voluntary soil assessments based on its internal assessment system; in the future, it will carry out assessments in keeping with methods dictated by law.

5) Complaints

13 Complaints in Fiscal 2001

In fiscal 2001, the Kyowa Hakko Group's business sites collectively received a total of 13 complaints due to the inconveniencing of residents in areas near our plants. As in fiscal 2000, these complaints mainly related to odors and noise.

SOCIAL PERFORMANCE

● Preserving Safety and Health

- In fiscal 2001, Kyowa Hakko, Kyowa Yuka, and Kyowa Medex recorded an occupational injury frequency rate of zero.
- Kyowa Yuka's Yokkaichi Plant has recorded 20 million man-hours of labor/work accident-free operations and continues to operate without accidents.
- Kyowa Hakko's Fuji Plant received the Ministry of Health, Labour and Welfare Award for achieving a level two safety record, equivalent to 9.3 million man-hours of labor/work accident-free operations, and continues to operate without accidents.

1) Occupational Safety

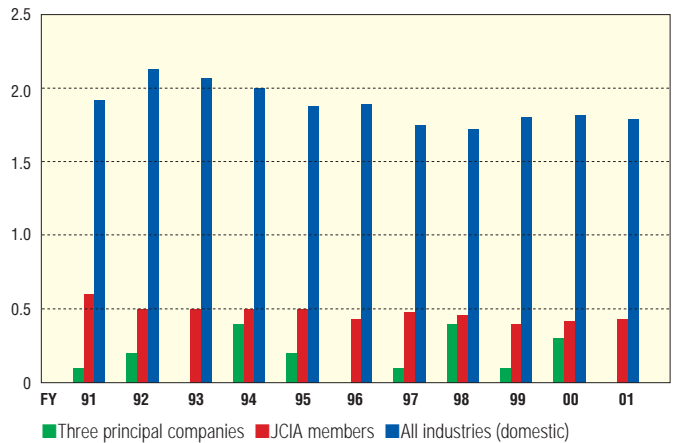
We at the Kyowa Hakko Group have declared "safety to be the foundation of our operations." To this end, we strive to strike an effective balance between such top-down safety measures as the adoption of thorough safety policies and a safety assessment system as well as the evaluation of safety-related activities and such bottom-up initiatives as zero-accident activities, facility improvement plans, and the KY (risk-detection) system.

In fiscal 2001, the Group's three principal companies recorded no occupational injury accidents with absence and, as shown in the graph at right, their occupational injury frequency rate ranks among the best in the chemical industry.

The Yokkaichi Plant marked 20 million man-hours of labor/work accident-free operations in July 2002, while the Fuji Plant earned the Minister of Health, Labour and Welfare Award for its level two safety record of 9.3 million man-hours of labor/work accident-free operations. The table below lists some of the major safety and health awards that the Company has received since 2000.

In fiscal 2001, the Group's eight domestic consolidated subsidiaries and 10 domestic plants had a total of three labor/work accidents with absence, down from six in the previous fiscal year.

Yearly Changes in the Occupational Injury Frequency Rate in the Three Principal Companies



The occupational injury frequency rate refers to the number of injuries from disasters and accidents per one million man-hours.

2) Occupational Health

We comply with legally mandated health checks and encourage all employees 30 years of age or over to have regular, thorough checkups in an effort to prevent the need for hospitalization. Furthermore, each business site promotes participation in various club activities and distributes health magazines from health insurance organizations to promote sound physical and mental health.

3) Traffic Safety

Kyowa Hakko's seven sales bases carry out sales activities using 1,181 automobiles (as of March 2002). We are expanding traffic safety activities that follow our Companywide traffic policy at all business sites, and we have maintained a stellar safety record in the pharmaceutical industry.

In consideration of the environment, we replaced 224 of the 691 vehicles we lease for sales activities with low-emission vehicles (as of March 2002). In the future, we plan to continue to replace old vehicles with low-emission ones.

Principal Health and Safety Awards

Fiscal Year	Name of Award	Plant Receiving Award
2000	Fire Defense Agency Commissioner's Award (Excellent business facility handling hazardous materials)	Fuji Plant
2000	Minister of Labour Award (Safety)	Yokkaichi Plant
2000	Minister of International Trade and Industry Award (Excellent manufacturing facility for high-pressure gas)	Yokkaichi Plant
2001	Minister of Health, Labour and Welfare Group Award	Kyowa Kai at the Ube Plant
2001	Fire Defense Agency Commissioner's Award (Contributor to Safety Maintenance Award)	Head Office
2001	Blood Donation Prize (Minister of Health, Labour and Welfare)	Hofu Plant
2001	Minister of Health, Labour and Welfare Award, level two (9.3 million man-hours accident-free record)	Fuji Plant

SOCIAL PERFORMANCE

● Coexistence with Local Communities

● Dialogue with Local Communities

In cooperation with representatives of its local community's residents, the Yokkaichi Plant, an industrial complex, periodically hosts meetings of the Kasumigaura Environmental Pollution and Accident Prevention Association to create dialogue and promote residents' understanding of our accident prevention and environmental activities.

We are presently engaged in major construction at the Sakai Plant, the details of which we are endeavoring to explain to local residents through a residents' association to facilitate acceptance of the project. Other plants are also furthering dialogue with local residents and governments regarding environmental and safety issues.

In dialogue between local communities and the head office in particular, we are making efforts to pursue high-profile and highly public environment- and safety-related activities, including dialogue and cooperative activities with environmental NPOs and NGOs, exchange with the media, and industry and academic activities.

The *Health, Safety, and the Environment/Sustainability Report* (Japanese and English versions) is widely distributed from each of our business sites to organizations and local governments as well as other public institutions, and is also available at the Kyowa Hakko Web site <<http://www.kyowa.co.jp>>. Production sites distribute their site reports via the Internet.

● Dialogue with Local Communities Encouraged by the Environmental Assessment System

In fiscal 2001, the Hofu Plant and Fuji Plant conducted environmental assessments of the construction of incineration facilities for industrial waste and held community briefings based on the results of the assessments (see page 32, "Dioxin Emissions").

● RC Activities

As a member of the Japan Responsible Care Council (JRCC), Kyowa Hakko has published its *Health, Safety, and the Environment/Sustainability Report* since fiscal 1999 to disclose information regarding its activities related to safety, health, and the environment, its yearly impact on the environment, its emissions of adverse chemical substances, and other relevant information.

Also, we participate in local explanatory meetings to ensure open communication with local governments and residents.



Speech at an RC explanatory meeting for Yamaguchi area residents (June 2002)



RC explanatory meeting for Sakai/Senboku area residents (February 2002)

Management Guideline and Points (Society)

Management Guideline:

We will promote transparent operations that are in accordance with international standards.

Points (Extract):

- We will carry out corporate activities that aim to realize growth that is in harmony with the communities in which we have operations, thus contributing to the development of society and the economy.
- We will work to earn the understanding and trust of local communities through communications, including the exchange of information, and participation in social contribution activities.
- We will carry out social contribution activities that will provide the young people who will lead the next generation with guidance for their lives and dreams to follow.
- We will respect the culture and customs of the regions—both domestic and overseas—in which we operate.
- In the event of a disaster, we will work closely with the local community in aid activities as well as recovery and reconstruction.

● Making Science Accessible

● Scientific Experimentation Classes

Mobile Science Experimentation Class Bio Adventure Bus
At the Tokyo Research Laboratories, a special bus loaded with microscopes and other scientific equipment is taken to local elementary, junior high, and high schools by a researcher who serves as the teacher of a scientific experimentation class. In fiscal 2001, the bus visited nine schools where more than 320 students participated in the classes.



Machida High School—Searching for genes



Bio Adventure Bus

Spring Science School

In April 2002, the Pharmaceutical Research Institute held a scientific experimentation class for local elementary school students. This was the second such class, which was held for the first time during the 2001 summer vacation.



Newspaper article about the school

Summer Science School

In August 2002, the Ube Plant held its 13th science class, Junior Science School, for elementary school students for half a day during the summer vacation.



2002 Junior Science School

● Science for a Bright 21st Century Essay Contest Sponsorship

Kyowa Hakko is a cosponsor of a science essay contest for junior high and high school students. Our hope is that this contest will raise the number of young people with an affinity for science. 2002 will mark the fourth such contest, whose primary sponsor is the *Mainichi Shimbun* newspaper.



"Science for a Bright 21st Century" poster calling for essays

● Cultural Activities for Young People Sponsorship

The aim of this group is to enrich dialogue between children and their parents, nurture young people's well-being, and contribute to a brighter future through musicals. The event, which features a new musical each year, celebrated its tenth anniversary in 2001.



Pamphlet for Jean-Henri Fabre's "The Life of Insects"

● Asahi Young Session Sponsorship

The 14th Asahi Young Session, held at the Kudan Hall in September 2001, featured professor Shuji Nakamura, the first person in the world to create a product that puts a blue light emitting diode to practical use, whose speech was entitled "Follow Your Dreams wherever They May Take You." A free booklet of the speech was distributed to those who wanted one. The primary sponsor of the event was the *Asahi Shimbun* newspaper.



Professor Shuji Nakamura



Kudan Hall

SOCIAL PERFORMANCE

●Arousing Interest in Science

●Yamaguchi Kirara Fair

At the 21st Century Future Exhibition Japan Expo Yamaguchi 2001 (Yamaguchi Kirara Fair) held by Yamaguchi Prefecture, Kyowa Hakko exhibited a booth that featured an "Anima Hall," where its activities for peaceful coexistence with nature were explained.



Pavilion entrance



Congratulations to the 150,000th attendee!

●Kato Memorial Bioscience Foundation's Symposium and Research Assistance

In October 2001, the theme of the 18th symposium held by the Kato Memorial Bioscience Foundation was "The Current State of Regenerative Medicine and the Road Ahead" and took place at the Japan Federation of Economic Organizations' hall. The Foundation continues to provide scholarships and assistance to nurture promising young researchers and promote research and development in fundamental areas.



Symposium auditorium



Animated discussion

●Environmental Assistance Activities

●The Ube Plant's Cooperation with Yamaguchi Prefecture in Promoting the Creation of a Foundation for the Transfer of Environmental Protection Technology to Shandong Province, China

In January 2002, we welcomed Environmental Engineering researchers from Yamaguchi University who were studying wastewater treatment.



Training at wastewater treatment facilities

●The Moji Plant's Participation in Group Training Held by the Japan International Cooperation Agency (JICA)

In May 2002, the Moji Plant participated in training on wastewater treatment methods for fermentation plants.

Training at recycling facilities for processing *shochu* residue

●Member of the Japan Federation of Economic Organizations' 1% Club

The Japan Federation of Economic Organizations advocates among its members an investment in social contribution activities of 1% or greater of ordinary income. Kyowa Hakko already dedicates more than 1% of its ordinary income to social contribution activities, particularly in the form of donations, and in fiscal 2001, the total yen value of its social contribution activities came to ¥1,636 million, or 8.6% of ordinary income.

● Employees

The Kyowa Hakko Group seeks employees with vitality. To raise our employees' various capabilities and ensure that they are able demonstrate their creativity, we evaluate and compensate employees in a fair manner, thereby creating a workplace charged with motivation.

● Highly Motivated Employees

Creating a Proactive and Creative Workplace and Providing Opportunities

Active challenge system (In-house recruitment system)
Skill development program
Research fellow program
Flex-time system
Rejuvenation holiday system

Support for Self-Improvement

Overseas study system
Education program:
We have an eight-rank educational training program.

Fair Evaluations and Compensation

Work-type classification system:
Employees are evaluated on the basis of the abilities and performance they have demonstrated in carrying out their duties.

By establishing the basic parameters of each person's work, we make fair evaluations and compensation.



Mr. Yoichiro Sugimura (center) at Northwestern University in a suburb of Chicago, Illinois



Dr. Noriaki Uesaka (in the striped shirt) at the Scripps Research Institute in La Jolla, California

Management Guideline and Points (Employees)

Management Guideline:

We will promote proactive and creative thinking and create a rewarding workplace through fair evaluations and compensation.

Points (Extract):

- We will nurture a corporate culture that encourages proactive and creative work by providing opportunities for employees to demonstrate these qualities.
- We will carry out thorough evaluations and award compensation based on work, special skills, and performance.
- We will upgrade training programs and a self-improvement system.
- We will provide support programs for financial planning.
- We will ensure a safe and hygienic workplace.
- We will create a work environment that fosters both mental and physical health.
- We will create a work environment that enables every employee, including senior citizens, women, people with disabilities, and foreigners, to demonstrate their abilities.
- We will create an environment in which employees can act as members of the community and participate in activities to improve the community.

SOCIAL PERFORMANCE

●Award System

We have established the award programs listed below to recognize employees who have demonstrated outstanding performance.

President's Awards

These are special awards that recognize significant contributions to our performance, including new discoveries, new technologies, outstanding sales increases, and improvements in productivity.

In-House Company Awards

Individual in-house companies' presidents' awards

Corporate Center Awards

Research Division Director's Award, Corporate Safety and Environmental Management Department's General Manager's Awards

Production Plants Awards

Plant general managers' awards



The recipients of President's Awards and other awards



President's Award recipients



Outstanding applied invention reward recipients

Rewards for Employee Inventions, etc.

A monetary reward is given to employees who have created outstanding inventions, projects, designs, or programs.

In fiscal 2001, we rewarded employees for 140 inventions with potential, 41 inventions that have been registered, and 1 outstanding applied invention making a contribution to performance.

●Lifestyles with Leeway

Promotion of Financial Planning Support and Safety and Hygiene

Family benefits: We maintain a variety of employee benefit plans, including home financing and savings plans. We also conduct physical checkups, sponsor health and fitness seminars, operate recreational lodge facilities, and offer counseling services.

Fostering Women's Skills

Maternity leave system: Under our maternity leave system, mothers can take a leave of absence from work until their children are one year old. Each year, approximately 50 employees take maternity leave.

Childcare support: The childcare support that we provide is in the form of shared costs for employees who have early elementary school-aged children receiving childcare services in their own homes. More than 90 employees use babysitters.

Sexual harassment prevention: In addition to conducting training seminars, we have devised a Sexual Harassment Prevention Guide based on the Kyowa Hakko Codes of Ethical Conduct for Employees. We have also created a support system, with a Sexual Harassment Advisor assigned to every one of our facilities and also to the branch offices of our labor union.

Supporting Employee Participation in Community Activities

Employees are permitted to use any accumulated paid vacation days remaining at the end of the year for taking part in volunteer activities.

● Social Considerations Related to Safety and the Environment in the Pharmaceutical Business

Kyowa Hakko's pharmaceutical business encompasses a wide range of fields, including cardiovascular agents, antiallergic agents, central nervous system agents, and antitumor agents, thereby contributing to the enhancement of people's health.

● Pharmaceuticals' Connection to Society and Communication with Our Customers

Kyowa Hakko is expanding its customer satisfaction activities. Our medical representatives (MRs) constitute the first line of our pharmaceutical business and work with the organizations that carry out the relevant support to provide product information from academic sources.

● Using IT to Facilitate Close Communication with Medical Treatment Sites

Feedback is actively collected from patients and healthcare professionals, and MRs can use their mobile computers to immediately access our marketing support center, which obtains information from the relevant departments.

● Customer Information Center

The Customer Information Center responds to inquiries from patients and their families as well as healthcare professionals who are endeavoring to provide their patients with the best care possible.

In June 2001, we established the Customer Information Center specifically to respond to drug-related inquiries. (E-mail: di@kyowa.co.jp)



Customer Information Center

● Disclosing Information through the Kyowa Hakko Pharmaceutical Web Site

Since its establishment in Japan in September 1998, Kyowa Hakko's Japanese-language Pharmaceutical Web site <<http://iyaku.kyowa.co.jp>> has enabled customers to access pharmaceutical-related information regardless of the time or day. At present, the general public can access information on the site without using a password. We are dedicated to both providing specialized information, through such channels as package inserts and other product information documents, and gathering data through questionnaires. In addition, we furnish easy-to-understand product explanation sheets for patients.

● Academic Seminar, Support of Research Workshops

When patients and healthcare professionals are able to fully understand the available information on our pharmaceuticals, our products' effectiveness can be demonstrated. For this reason, we provide ongoing support for academic seminars as well as hold and support workshops and symposia as part of our activities to promote our pharmaceuticals.

● Literature

We publish a variety of literature that provides healthcare professionals with information pertaining to our products.



Healthcare-related literature

SOCIAL PERFORMANCE

●Pharmaceutical Development and International Activities

The investment necessary for the development of pharmaceuticals increases yearly, and at present it costs from ¥50.0 billion to ¥80.0 billion to launch a new drug, a factor for consideration when operating a pharmaceutical business on a global scale.

Kyowa Hakko engages in overseas development amid differing cultures and regulations. Here, we would like to introduce U.S.-based Kyowa Pharmaceutical Inc. (KPI), one of the Company's front-line bases in overseas pharmaceutical development.

Dr. Dayao Zhao, Medical Director, KPI

"Although the company is small, its dreams are big. We would like to be able to deliver KW-6002, a first-in-class medication, to the many patients who suffer from Parkinson's disease, and this is the goal that defines our activities.

Our team members have shown strong solidarity in working at full capacity toward our goal of being able to provide patients with this medication as quickly as possible."



Dr. Dayao Zhao (fourth from the right), Medical Director, and the KW-6002 project team

●Unnecessary Pharmaceuticals and their Proper Disposal

Kyowa Hakko's bases in eastern and western Japan carry out the proper disposal of pharmaceuticals delivered to hospitals and other medical institutions that have passed their expiration dates or been recalled.

●Experiments Using Animals and Animal Welfare

Kyowa Hakko has established Ethical Standards for Animal Testing based on legal and academic guidelines, as well as Animal Testing Guidelines for each business site, and has set up committees at its head office and business sites to promote the implementation and use of the standards to ensure good practices. We encourage researchers to avoid conducting unnecessary animal experiments, select the appropriate species for experimental use, set appropriate scales for testing, and tend to the needs of the animals involved with the goal of causing no unnecessary suffering. We ensure that the research staff involved in these activities are fully apprised of and adhere to guidelines related to such matters as the safety, morality, and relevance of experiments in addition to which periodic verification is carried out by the head office.

●Environment-Friendly Packaging

Please see page 34 for details.

Management Guideline and Points (Customers)

Management Guideline:

Making customer satisfaction our first priority, we strive to provide products, services, and information with superior quality and function.

Points (Extract)

○We will create products, services, and information that satisfy customers, are at the forefront of the era, and have new value.

○We will diligently work toward Groupwide cooperation to disseminate customer feedback with the aim of quickly responding to customer needs and complaints.

○We will actively collect safety information and incorporate it into products, services, and information while making the necessary disclosures to customers.

○We will implement such international quality assurance systems as GMP, ISO, and HACCP to improve manufacturing and quality management.

ENVIRONMENTAL PERFORMANCE

● Environmental Accounting

1) In-House Companies' Environmental Protection Expenses

The Kyowa Hakko Group has developed its business in five fields, which comprise pharmaceuticals, bio-chemicals, chemicals, food, and liquor & alcohol, engaging in all manufacturing processes from the bulk materials stage to final product manufacturing. We have calculated the costs associated with those

processes in accordance with the Environmental Accounting Guidelines (2002) laid out by Japan's Ministry of the Environment (see the next page). Environmental protection expenses in fiscal 2001 by in-house company are detailed below.

Environmental Protection Expenses by In-House Company and Other Expenses



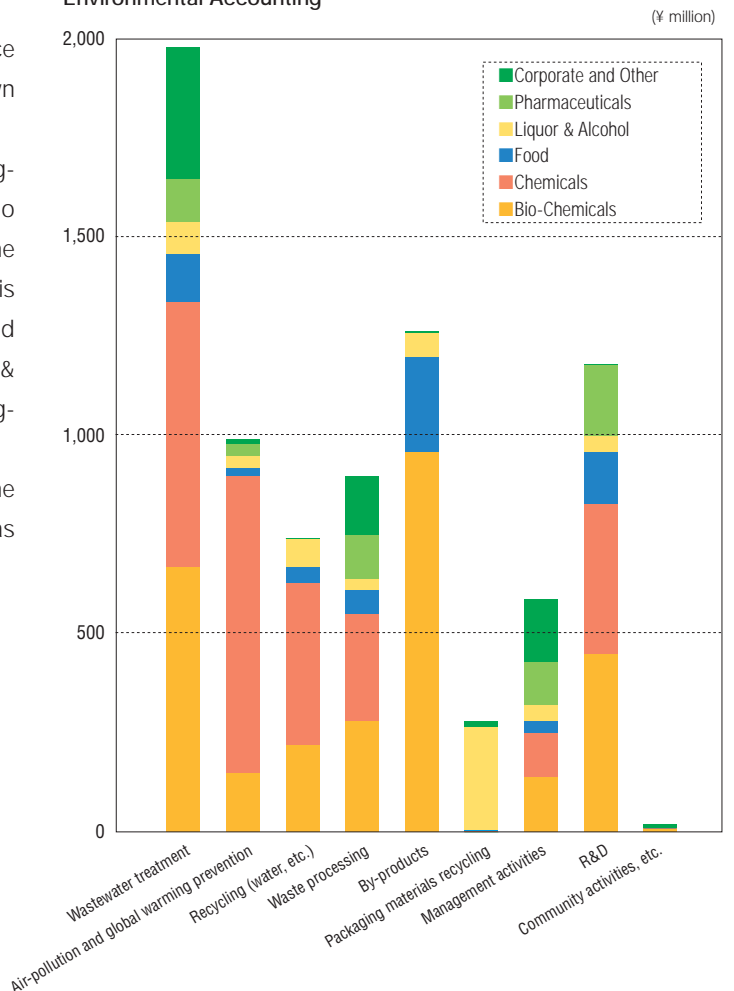
2) Classification of Environmental Protection Expenses in Environmental Accounting

Environmental protection expenses are classified in accordance with environmental accounting guidelines and are broken down by in-house company in the graph on the right.

The Bio-Chemicals and Food companies account for a significant share of recycling costs and energy costs due to molasses use and recycling. Although resource efficiency in the Chemicals Company, which manufactures petrochemicals, is high, the costs of wastewater treatment and air-pollution and global warming prevention are considerable. The Liquor & Alcohol Company accounts for a significant portion of packaging materials recycling costs.

Please refer to pages 24 and 25 for information regarding the breakdown of material balance by in-house company as well as environmental accounting.

Environmental Protection Costs as Classified by Environmental Accounting



ENVIRONMENTAL PERFORMANCE

3) Environmental Accounting

We engage in environmental accounting based on guidelines for 2002 issued by the Ministry of the Environment for the compilation of environmental protection costs and effects. This accounting concerns fiscal 2001 environmental activities at nine domestic plants and two domestic research institutes operated by Kyowa Hakko, Kyowa Yuka, and Kyowa Medex as well as six domestic subsidiaries with production departments, the inclusion of which has expanded the scope of our environmental accounting activities.

Environmental Protection Costs (¥ million)				
Classification		Principal Activities	Investment (¥ million)	Expense ^{*1} (¥ million)
(1) In-Situ Operating Costs			699	5,877
Breakdown	(1)-1 Pollution Control Costs	<ul style="list-style-type: none"> Rebuilding, improvement, and operation/maintenance of wastewater treatment facilities 	237	1,983
		<ul style="list-style-type: none"> Enhancement of flue gas collection facilities and low NO_x burner boiler, operation/maintenance of flue gas desulfurization, denitration, exhaust gas facilities Enhancement and operation/maintenance of odor control facilities Pollution load levy, etc. 	208	534
	(1)-2 Global Environmental Protection Costs	<ul style="list-style-type: none"> Purchase and fixation of gaseous CO₂ through the oxo process for use as raw material (Kyowa Yuka) Boiler fuel conversion (crude oil→city gas) Consolidation of steam pipework, enhancement of various equipment to effect energy savings 	116	458
	(1)-3 Resource Recycling Costs	<ul style="list-style-type: none"> Weight reduction, volume reduction of industrial waste; operation/maintenance of industrial waste recycling facilities Operation/maintenance of industrial waste treatment and disposal facilities, outside treatment Installation of exhaust gas recovery and reuse facilities, operation/maintenance of water-saving facilities 	138	2,902
(2) Upstream and Downstream Costs		<ul style="list-style-type: none"> Added cost of providing environment-friendly products Recycling and recovery of packaging materials Outsourcing recycling of packaging materials 	0	281
(3) Environmental Activities Costs		<ul style="list-style-type: none"> Set-up, operation of Environmental Management System Creation of materials that disclose environment-related information Environmental improvement, including nature conservation, greening, beautification, scenery preservation 	19	587
(4) R&D Costs		<ul style="list-style-type: none"> R&D of environment-friendly products R&D aimed at controlling environmental impact at the production stage 	5	1,182
(5) Community Activities Costs		<ul style="list-style-type: none"> Membership in and cooperation with environmental protection and nature conservation activities 	0	9
(6) Environmental Damage Related Costs		<ul style="list-style-type: none"> Oil pollution liability insurance 	0	1
Total			724	7,937

(¥ million)

Item	Activities	Amount
Total Investment	Expansion of pharmaceutical compartmentalization facilities at pharmaceutical plant	10,372
Total R&D Costs	R&D of new products and technologies	29,298
Sales of Items Related to Resource Recycling as in (1)-3	Fertilizer containing organic materials, materials enriched with <i>shochu</i> distillate, used catalysts, containers for raw materials, etc.	452
Effect Related to Saving Resources as in (1)-2 and 3	Conservation of energy, water, and resources and waste reduction	1,721

*1 Expenses include depreciation, personnel costs, utility fees, cost of materials, cost of repairs, outside contracting costs, and commissions.

*2 Fresh water usage volume: 60.3 million tons

While overall expenses rose slightly, to ¥7.9 billion, in fiscal 2001, this was due to the expansion of the scope of evaluation as well as the enhancement of R&D.

Scope of evaluation: Kyowa Hakko and its domestic consolidated production subsidiaries

Period covered: April 1, 2001, through March 31, 2002

Focus	Effect			Criteria
	FY2001	Comparison with FY2000	Remarks (Future Measures)	Self-Imposed Control Standard in FY2000
Water pollution control • Total volume of wastewater • COD levels • Nitrogen levels • Phosphorous levels	62.1 million tons*2 1,235 tons 807 tons 33.7 tons	1.6 million-ton decrease 9-ton decrease 102-ton decrease 1.1-ton decrease	Approximately the same levels as the previous year 1% reduction, removed 3,900 tons of COD 11% reduction from previous year 3% reduction from previous year	— 1,642 tons 1,614 tons 86 tons
Air pollution control • SO _x emissions • NO _x emissions • Dust emissions	1,176 tons 611 tons 39 tons	117-ton decrease 31-ton decrease 5-ton decrease	9% reduction from previous year 30% reduction from 1998 11% reduction from previous year	2,685 tons 825 tons, 20% reduction compared with 1998 354 tons
Unit energy consumption (crude oil conversion) • Kyowa Hakko, Kyowa Medex, plus 6 other companies • Kyowa Yuka	61.1 kl/ ¥100 million of sales 176 l/ton of production	1.6 kl/ ¥100 million of sales improvement 3 l/ton of production improvement	3.6% improvement compared with 1998	3% improvement compared with 1998
CO ₂ use (Kyowa Yuka)	78,000 tons	6,000-ton increase	Recycled into raw material for oxo alcohol production using the oxo method	
Waste • Waste materials • Waste disposal at landfill sites	204,000 tons 1,949 tons	41,000-ton decrease 322-ton decrease	36% reduction compared with 1998 53% reduction compared with 1998	50% reduction from 1998 levels by 2004 50% reduction from 1998 levels in 2001
<ul style="list-style-type: none"> • Established Guidelines for Environment-Friendly Packaging Materials for food & liquor and published them on our Web site • Eliminated external boxes for all pharmaceutical shipments, achieved waste reductions • Introduced environment-friendly PET bottle labels, eliminated metal can packaging for biochemical products, moves that put us at the forefront of the industry's recycling activities 				
<ul style="list-style-type: none"> • Acquired ISO 14001 certification for Kyowa Medex, set target of having established ISO 14001 systems for all consolidated subsidiaries by fiscal 2004 • Published <i>Health, Safety, and the Environment Report 2001</i> in both Japanese and English, provided site reports in Japanese on our Web site • Pursued such environmental activities as nature conservation 				
<ul style="list-style-type: none"> • Recorded the successful performance of and are continuing R&D on a livestock feed additive that hydrolyzes phytic acid as well as a cross-linkable monomer for waterborne coatings • R&D of waste treatment and energy-saving technologies (improvement of distillation columns, etc.) 				
<ul style="list-style-type: none"> • Participation in JRCC activities, support of environmental preservation organizations 				

[Major Successes]

- In 1997, we reduced to zero the amount of fermentation mother liquor disposed of in the ocean and since then continue to recycle virtually all of it.
- We have reduced nitrogen levels 11% through improvements at our fermentation plants.
- By enhancing boilers that use low NO_x burners, and pursuing ongoing improvements, we have reduced NO_x emissions 30% from 1998 levels.
- We have made progress with improving processes, enhancing facilities, and recycling a greater proportion of waste materials under the Kyowa Eco-Project (concentrated on energy-saving and waste-reduction activities). We reduced our unit energy consumption 3.6% and our waste disposal at landfill sites 53% from 1998 levels.
- Sales of resources, energy conservation, waste reductions, resource conservation, and water conservation were valued at approximately ¥1.7 billion.
- Through the adoption of the oxo method, Kyowa Yuka has achieved annual CO₂ use of 78,000 tons, thus fulfilling its responsibility for recovering CO₂. These figures correspond to less than 20% of the total volume of CO₂ emissions of Kyowa Yuka.

ENVIRONMENTAL PERFORMANCE

●Material Balance and Environmental Accounting by In-House Companies

We have summarized the material balance and environmental accounting information for each of our three principal in-house companies. The figures presented here exclude environmental impact incurred prior to the receipt of raw materials.

The chart below shows consumption rates for energy, raw materials, packaging materials, and fresh water, usage volumes of which were divided by production value and production volume. The volumes of waste disposal at landfill sites (final disposal) and air and water pollution have also been divided by production volume to calculate unit emissions. Special characteristics and issues particular to individual in-house companies are reflected in the chart.

We received guidance in compiling and evaluating these results from the Research Center for Life Cycle Assessment of the National Institute of Advanced Industrial Science and Technology.

Resource Efficiency by In-House Company

		Pharmaceuticals	Bio-Chemicals	Chemicals	Food	Liquor & Alcohol	Kyowa Hakko*
Resource Efficiency	tons/¥100 million sales	1.4	280	1,200	280	100	310
	tons/tons of production	2.2	3.9	0.59	0.97	0.36	0.63
Fuel Efficiency	kl/¥100 million sales	1.6	270	360	57	37	120
	kl/tons of production	26	3.7	0.18	0.20	0.13	0.24
Packaging Materials Efficiency	tons/¥100 million sales	2.7	1.5	1.0	1.5	14	8.0
	tons/tons of production	3.9	0.08	0.001	0.04	0.11	0.016
Fresh Water Resource Efficiency	1,000 kl/¥100 million sales	2.6	160	15	13	0.7	33
	1,000 kl/tons of production	4,300	2,200	7.4	45	2.7	65

Resource efficiency: Index of total usage of agricultural and petrochemical raw materials

*Three principal companies

Fuel efficiency: Index uses crude oil conversion to express energy usage in kl

Unit Emissions by In-House Company

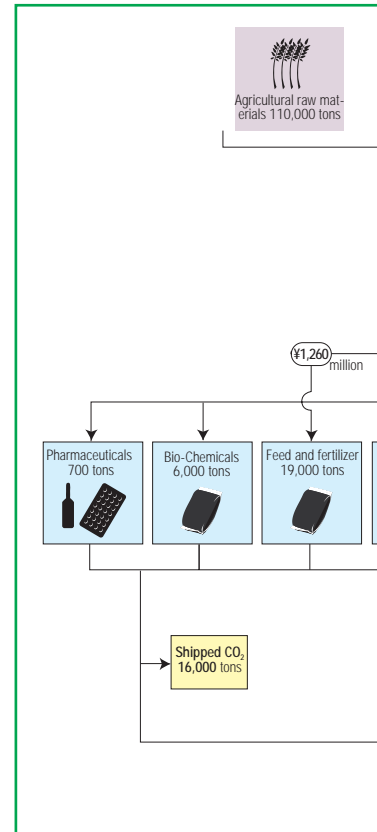
		Pharmaceuticals	Bio-Chemicals	Chemicals	Food	Liquor & Alcohol	Kyowa Hakko*
Unit CO ₂ Emissions	tons/¥100 million sales	1.4	280	1,200	280	100	310
Unit Final Disposal	tons/¥100 million sales	1.6	270	360	57	37	120
Unit Water Pollution Emissions	tons/¥100 million sales	2.7	1.5	1.0	1.5	14	8.0
Unit Air Pollution Emissions	tons/¥100 million sales	2.6	160	15	13	0.7	33

Unit water pollution emissions: Index of total COD, N, and P levels

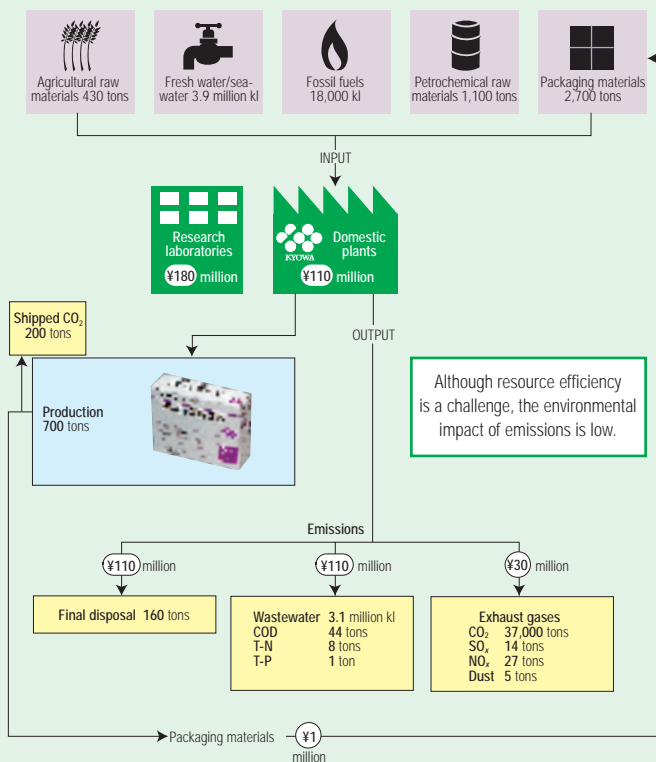
*Three principal companies

Unit air pollution emissions: Index of total SO_x, NO_x, and dust emissions

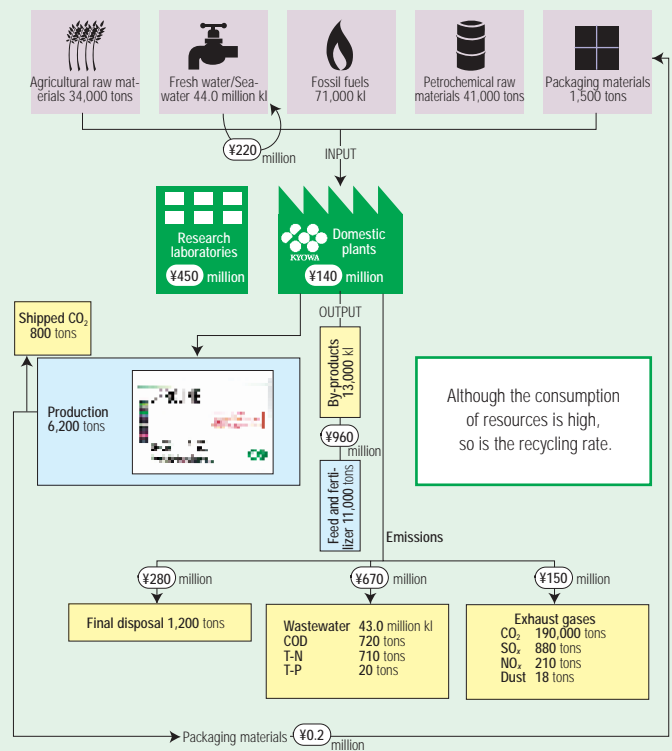
●Three



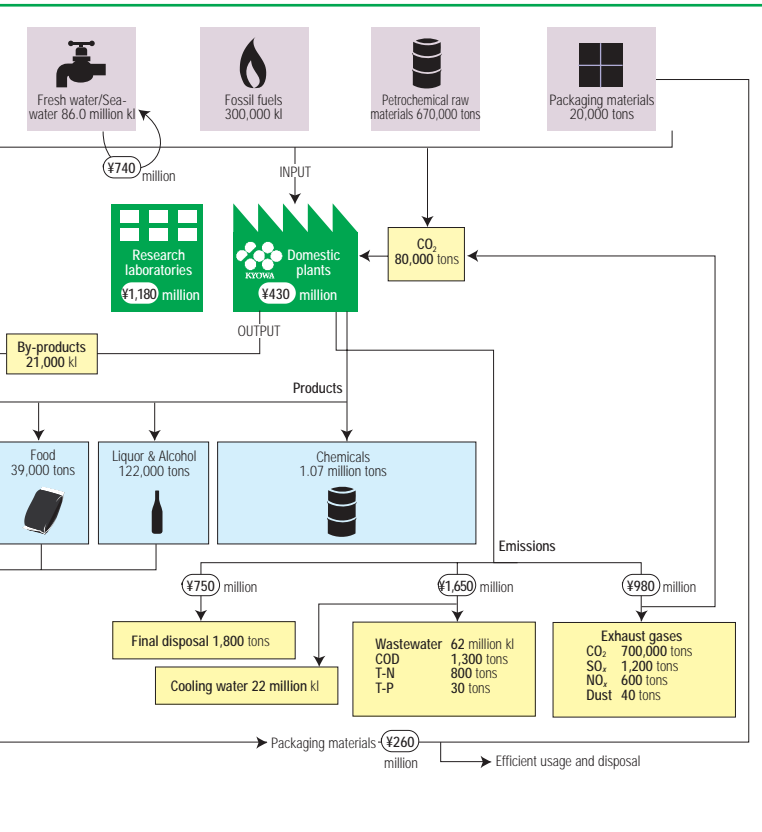
●Pharmaceuticals Company



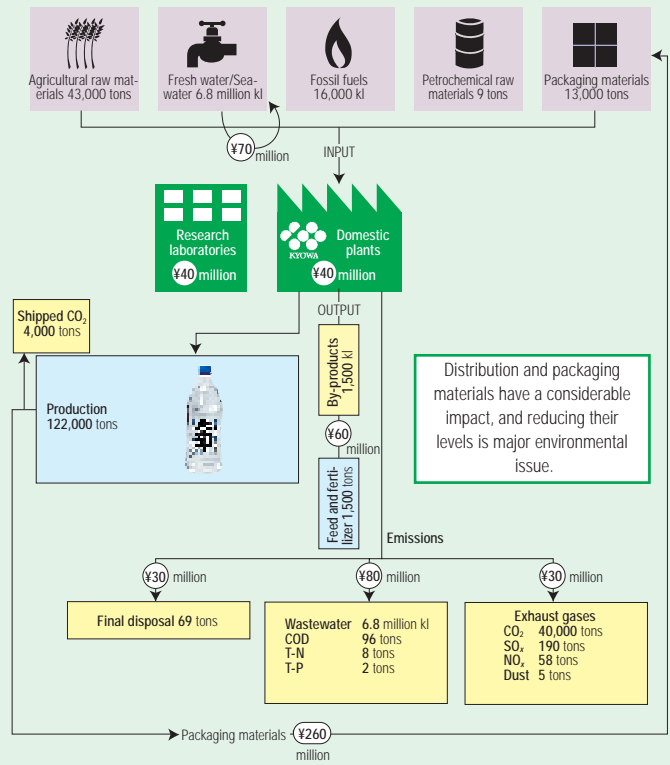
●Bio-Chemicals Company



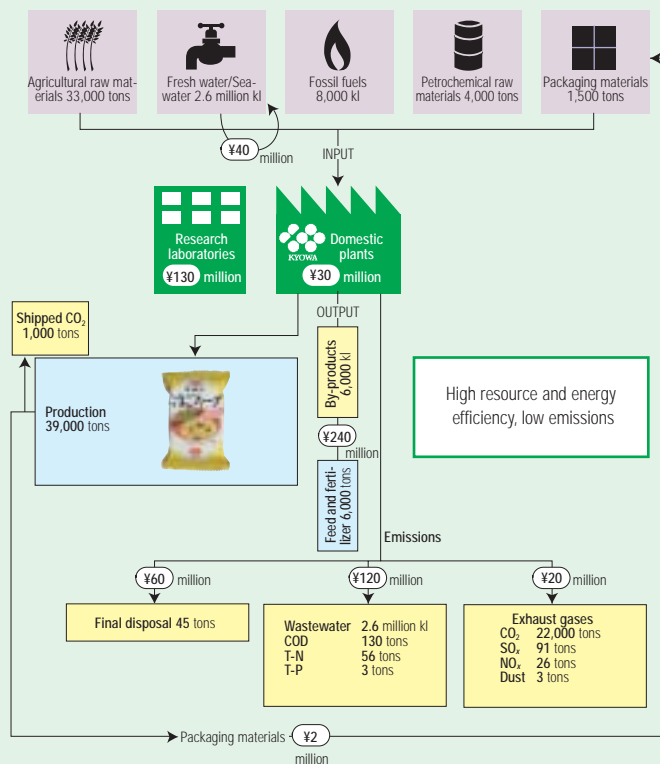
Principal Companies (Equivalent to 96% value of Group shipments)



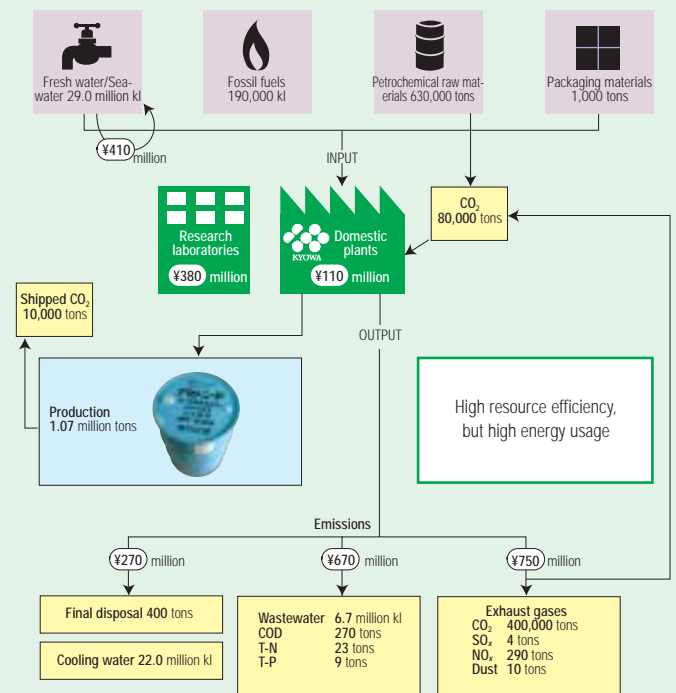
Liquor & Alcohol Company



Food Company



Chemicals Company



ENVIRONMENTAL PERFORMANCE

● Environmental Protection Activities

1) Responses to Global Warming

- Unit energy consumption in fiscal 2001 improved 3.6% compared with fiscal 1998, achieved target (3% improvement)
- Total energy consumption was equivalent to 314,522 crude oil kiloliters, a 2.8% increase from previous fiscal year
- CO₂ emissions totaled 708,202 tons, a 1.1% reduction from previous fiscal year

Kyowa Hakko and Kyowa Yuka accounted for 96% of all energy consumed by the Kyowa Hakko Group, and 97% of Group CO₂ emissions.

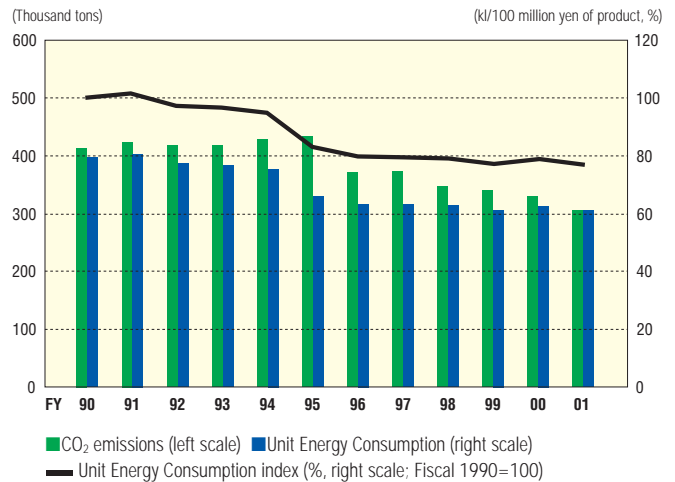
Having set a target of improving unit energy consumption by 3% in fiscal 2001 compared with fiscal 1998, Kyowa Hakko Group achieved a 3.6% improvement over the last three years.

Principal Energy-Saving Measures between Fiscal 1999 and Fiscal 2001

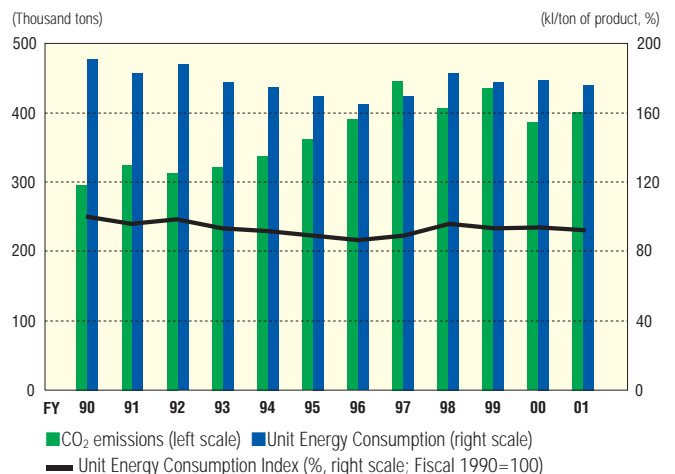
- Improved separation efficiency in distillation columns (Yokkaichi)
- Reduced power consumption in compressors and pumps (Chiba)
- Improved energy management in buildings (Ube, Fuji)
- Achieved more efficient configuration of steam piping within plant (Hofu)
- Achieved energy-saving in air compressors (Yokkaichi)
- Rationalized wastewater treatment (Hofu and Ube)
- Implemented steam-saving (Hofu, Chiba, Yokkaichi and Ube)
- Improved monitoring of energy use (all plants)

The total volume of energy used by the Kyowa Hakko Group in fiscal 2001 increased 3.6% compared with fiscal 1990, but the CO₂ emission volume was held at the 1990 level for the Group overall. In line with the Kyowa Eco-Project, which aims to curb CO₂ emissions, the Group is aggressively pursuing energy conservation and shifts to different energy sources.

Yearly Changes in Unit Energy Consumption (Kyowa Hakko Group, Excluding Kyowa Yuka)



Yearly Changes in the Unit Energy Consumption of Kyowa Yuka



Energy-saving distillation column with vertical partitions

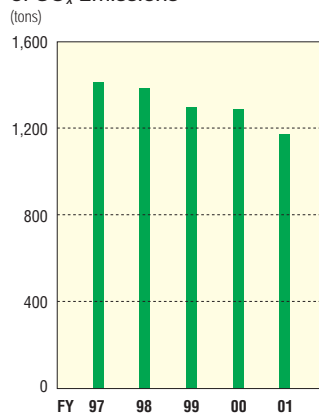
2) Approach to Preventing Air Pollution

Below is a breakdown of volumes of pollutants emitted into the atmosphere by Group activities in fiscal 2001. (The parenthetical figures show year-on-year change.)

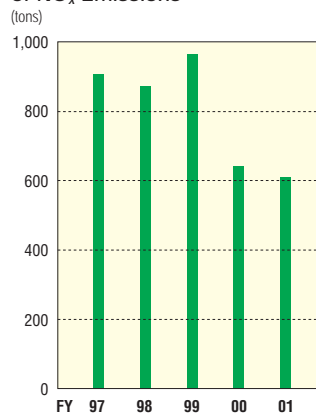
SO_x: 1,176 tons (9% reduction)
 NO_x: 611 tons (5% reduction)
 Dust: 39 tons (11% reduction)

In fiscal 2001, the Kyowa Hakko Group succeeded in reducing emissions of SO_x, NO_x, and dust compared with the preceding year, due chiefly to changes in types of fuels and the use of low-NO_x burners. Yearly changes in the volume of these emissions are shown below. We are considering the continuous reduction of emissions of SO_x.

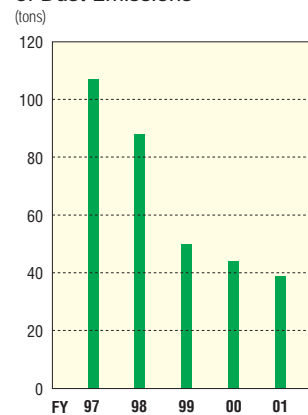
Yearly Changes in the Volume of SO_x Emissions



Yearly Changes in the Volume of NO_x Emissions



Yearly Changes in the Volume of Dust Emissions



3) Approach to Preventing Water Pollution

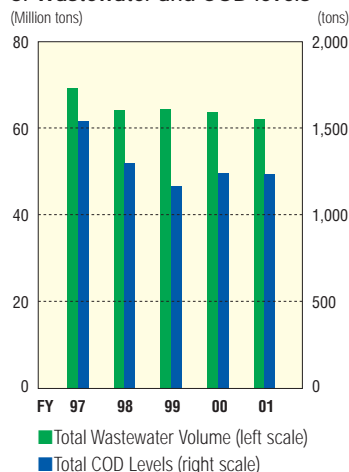
Below is a breakdown of volumes of pollutants emitted into water by Group activities in fiscal 2001. (The parenthetical figures show year-on-year change.)

Total wastewater: 62,056,000 tons (3% reduction)
 COD: 1,235 tons (1% reduction)
 Nitrogen: 807 tons (11% reduction)
 Phosphorus: 33.7 tons (3% reduction)

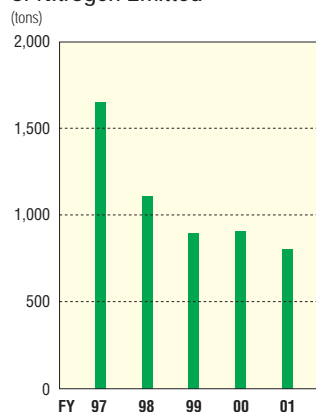
The overall volume of wastewater, COD levels, and phosphorus emissions in fiscal 2001 were held to the levels of the previous fiscal year, and an 11% reduction in nitrogen levels was achieved. Through improvements to production processes, the Company is working to reduce environmental impact. Consolidated subsidiaries are being assisted on an ongoing basis in this effort.

* Volume of fresh water consumed: 60,305,000 tons.

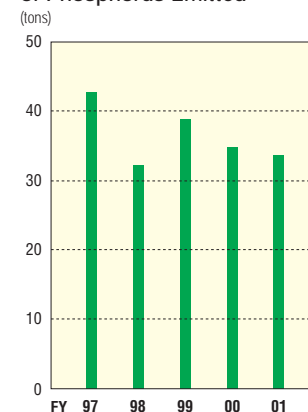
Yearly Changes in the Total Volume of Wastewater and COD levels



Yearly Changes in the Volume of Nitrogen Emitted



Yearly Changes in the Volume of Phosphorus Emitted



ENVIRONMENTAL PERFORMANCE

4) Approach to Reducing Waste Materials

- In fiscal 2001, waste disposal at landfill sites amounted to 1,949 tons, down 53% from 1998 levels and achieving target. (50% reduction in 2001)
- In fiscal 2001, waste materials generated totaled 203,901 tons, down 36% from 1998. (50% reduction in 2004)

Due to reduction and recycling measures for waste materials generated by the entire Kyowa Hakko Group, waste disposal at landfill sites constituted only 0.9% of waste materials generated.

Since 1999, the Kyowa Eco-Project has expanded the scope of its activities. This has enabled us to achieve the aforementioned targets. Furthermore, we are working to make progress toward our target for waste materials generated.

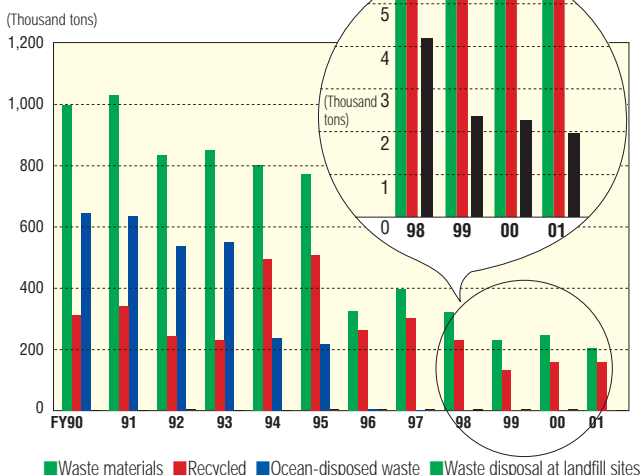
Principal Waste Material Countermeasures from Fiscal 1999 through Fiscal 2001

- Controlled and separated waste materials generated (all business sites)
- Reduced sludge output through the rationalization of operations of waste liquid treatment facilities (Hofu, Ube)
- Introduced environment-friendly packaging materials (Fuji, Ube, Tsuchiura, Moji)
- Recycled organic residue waste into fertilizers and feed (Hofu, Ube, and Moji plants)

The Kyowa Hakko Group is engaged in active resource recovery. We are committed to achieving zero emissions by fiscal 2007.

Zero emissions: Refers to the reduction of waste disposal at landfill sites to less than 0.1% of waste materials generated.

Yearly Changes in the Volume of Industrial Waste

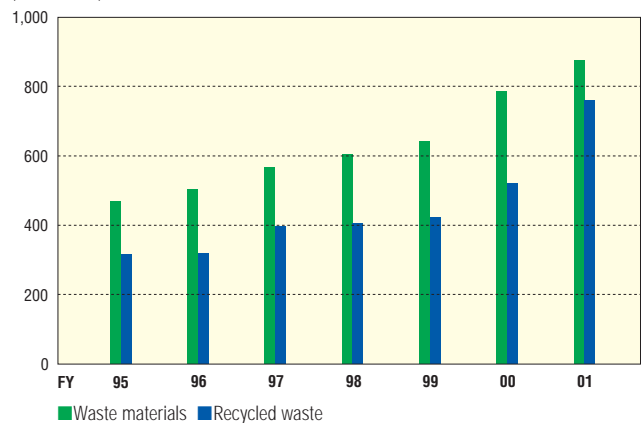


5) Activities at Overseas Production Facilities

The Kyowa Hakko Group boosted the waste materials generated to recycling ratio at its overseas business sites from 62% in 2000 to 87% in 2001 and is working toward achieving zero emissions with a target of 99% for 2003.

The Kyowa Hakko Group's three overseas business sites secure resources and manufacture and supply goods on a global scale and, as local corporations, engage in the specialized manufacture of amino acids. The Kyowa Hakko Group transfers environmental safety technologies perfected in Japan to overseas production bases as part of efforts to ensure environmental safety. In fiscal 2001, the resource recycling of fermentation waste from three overseas plants proceeded on schedule as a result of the bolstering of resource recycling efforts at the Mexico Plant. The concentration of waste materials involved in resource recycling requires increased energy use and has led to an overall increase in energy consumption at overseas facilities. Energy consumption at overseas business sites is equivalent to 44% of domestic energy usage by the Kyowa Hakko Group, while CO₂ usage at overseas business sites is equivalent to 38% of that of the Japan-based members of the Kyowa Hakko Group. The overseas business sites are thus endeavoring to rationalize this energy use. Here, we introduce Agroferm Hungarian Japanese Fermentation Industry Ltd., one such business site established ten years ago.

Yearly Changes in the Volume of Industrial Waste at Three Overseas Plants (Thousand tons)



Agroferm Hungarian-Japanese Fermentation Industry Ltd.
 Agroferm is one of Kyowa Hakko's European production bases. The company commenced operations in 1991 in Kaba, Hungary, manufacturing the amino acid lysine for use in livestock feed in Europe. Today, the company continues to steadily expand operations. In 1997, Kyowa Hakko began actively managing the company.

The company is located in the center of a major farming area, and its core business is the production of amino acids using fermentation. Fermentation mother liquor, which is generated during the fermentation process, is a waste material that contains a high density of organic substances. Fermentation mother liquor contains useful ingredients that are derived from raw materials as well as from the fermentation process. 100% of the "mother liquid" is used as an organic fertilizer by farms in

the surrounding area. In this way, the company has perfected sustained resource recycling.

In April 2002, the company carried out a joint environmental and safety assessment in cooperation with Kyowa Hakko. Although the facilities are 10 years old, excellent maintenance has enabled the company to keep a clean plant.

On-the-job safety: Since it commenced operations, the plant has only had one serious burn injury accident by medicine involving an employee. Injuries from falls and sprains, however, are more common here than in Japan. Consequently, we are currently promoting activities to reduce the incidence of such accidents by introducing domestic KY (risk-reduction) activities.

Environment: Highly concentrated fermentation "mother liquid" is welcomed by farms. Low-concentration waste liquid is also treated in an efficient manner.



Shipment of mother liquid (Agroferm)



Mother liquid being dispersed in farming operations (crop field on a plain in Hungary)



Safety and environmental audit/joint assessment



Employees at Agroferm



Panoramic view of plant

ENVIRONMENTAL PERFORMANCE

6) Chemical Substance Management

Below are the total volumes of 12 chemical substances emitted into the atmosphere by Group operations in fiscal 2001. (The OECD/JCIA have designated these 12 chemical substances priorities with regard to the restriction of emissions.)

Volume of 12 chemical substances emitted by the Group: 18.7 tons, a decrease of 95.5% from 1996 levels

Group target: to achieve a 95% reduction from 1996 emissions of these substances by fiscal 2004

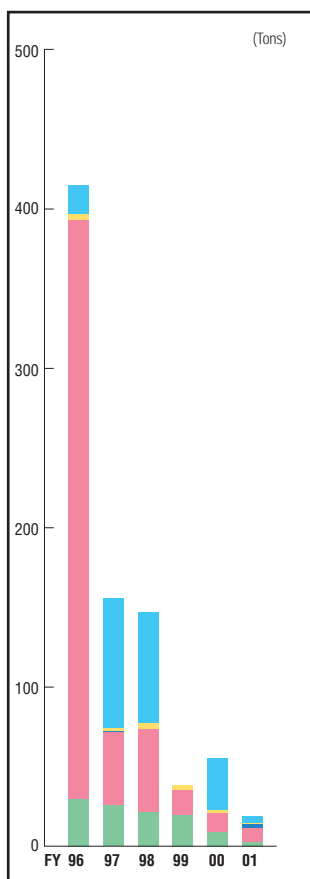
●Emissions of 12 Adverse Air Pollutants

Selected by the JCIA

The total output of these 12 substances is shown below. When using chemical substances, we carried out assessments that began at the research stage, modified production processes, developed processes that eliminated the use of organic solvents, and improved treatment and decomposition processes. Consequently, in fiscal 2001, we achieved a 4.5% reduction from 1996 emission levels (415 tons) for these 12 chemical substances, achieving our fiscal 2004 target far ahead of schedule.

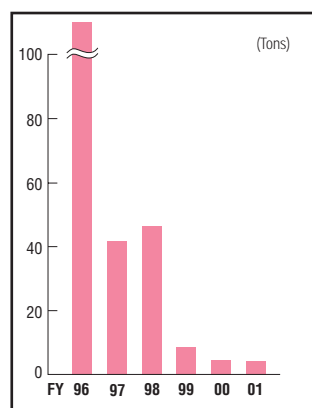
The emission volumes of each chemical are shown below. In fiscal 2001, reductions in emissions of dichloromethane and benzene were particularly significant.

Total Emissions of 12 Chemical Substances

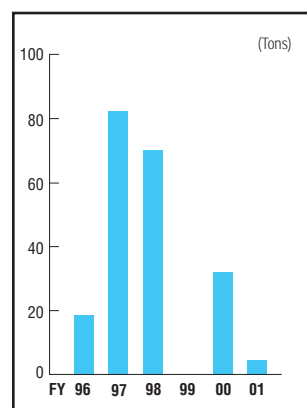


■ Hofu Plant
■ Fuji Plant
■ Sakai Plant
■ Yokkaichi Plant
■ Chiba Plant

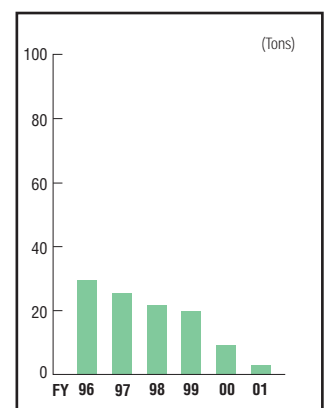
Acetaldehyde



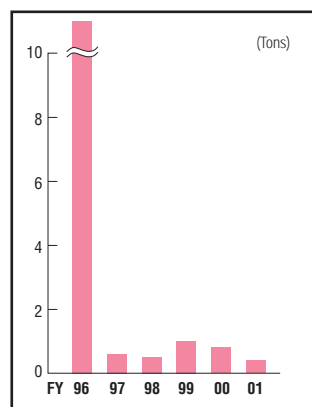
Dichloromethane



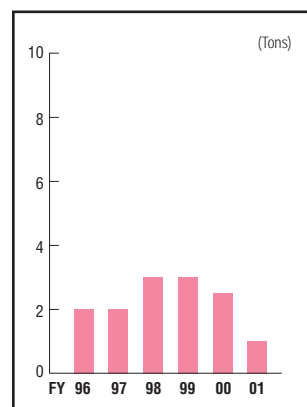
Benzene



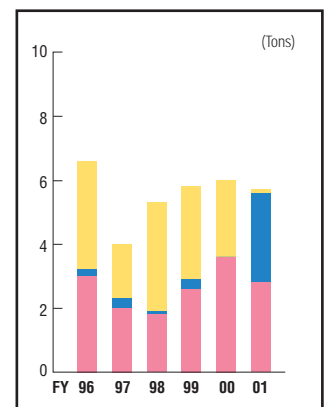
Formaldehyde



Ethylene Oxide



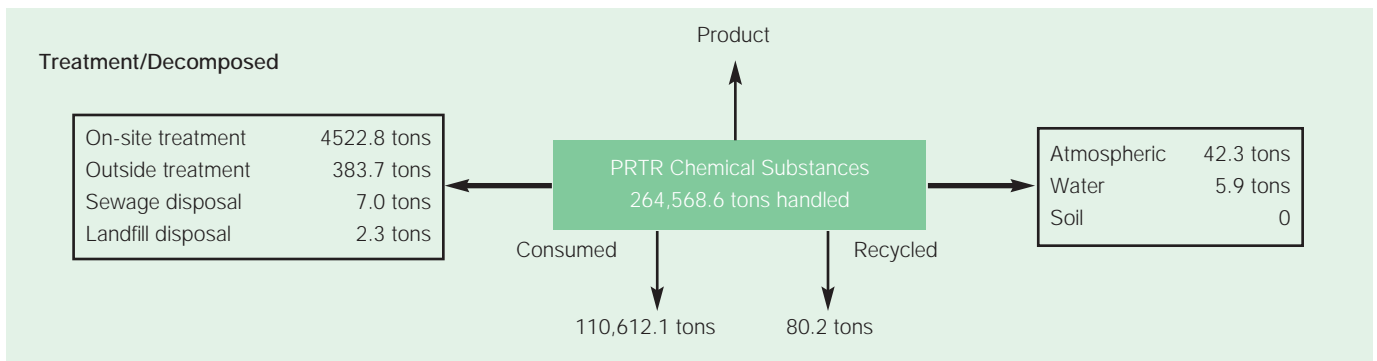
Chloroform



●Emissions of PRTR Law Class I Chemical Substances

The Kyowa Hakko Group places high priority on its PRTR activities, carrying out reviews and disclosing the results in its *Health, Safety, and the Environment/Sustainability Report*. The chart below shows volumes handled, consumed, and recycled as well as the volume of emissions and volume treated/

decomposed of class I substances by the Kyowa Hakko Group. In fiscal 2001, we handled approximately 270,000 tons of different substances, 48 tons of which were discharged into the environment, as shown in the chart. Fiscal 2001 performance by substance is also shown below.

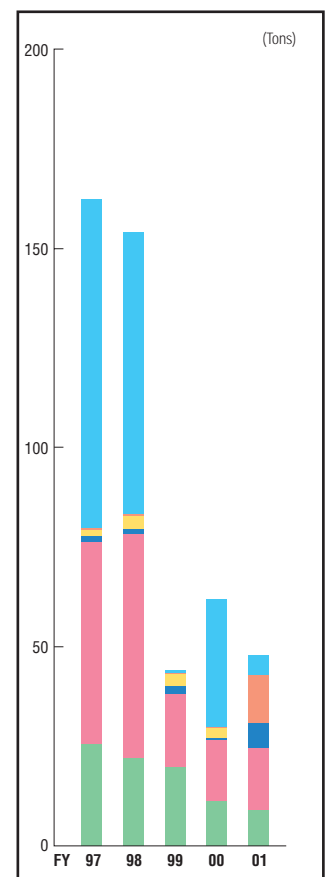


Fiscal 2001 Emissions of Class I Chemical Substances

Substance	Amount Handled (tons)	Atmospheric Emissions (tons)	Water Emissions (tons)	Soil Emissions (tons)
Water-soluble zinc compounds	7.7	0.0	0.4	0.0
Acetaldehyde*	96,905.7	1.1	3.0	0.0
Acetonitrile	0.6	0.0	0.0	0.0
2-amino ethanol	59.7	9.5	0.6	0.0
Alkyl benzene sulfonate	192.8	0.0	0.0	0.0
Ethylene oxide	14,955.0	1.0	0.0	0.0
Xylene	43.1	12.6	0.0	0.0
Chloroform	120.4	5.7	0.0	0.0
Vanadium pentoxide	1.8	0.0	0.0	0.0
Cobalt and cobalt compounds	9.4	0.0	1.9	0.0
1,2-dichloroethane	2.0	0.1	0.0	0.0
Dichloromethane	26.8	4.6	0.0	0.0
N,N-dimethyl formamide	8.7	0.9	0.0	0.0
3,5,5-trimethyl-1-hexanol	803.3	0.0	0.0	0.0
Toluene	64.5	3.4	0.0	0.0
Nickel	6.5	0.0	0.0	0.0
Nickel compounds	2.2	0.0	0.0	0.0
Dibutyl phthalate	4,652.0	0.0	0.0	0.0
2-ethylhexyl phthalate	95,693.6	0.0	0.0	0.0
Benzyl chloride	87.0	0.1	0.0	0.0
Benzene	7,986.8	2.9	0.0	0.0
Boron and boron compounds	2.0	0.0	0.0	0.0
Formaldehyde	365.9	0.4	0.0	0.0
Phthalic anhydride	42,334.5	0.0	0.0	0.0
Maleic anhydride	236.6	0.0	0.0	0.0
Total	264,568.6	42.3	5.9	0.0

*Includes emissions by J-Puls Co., Ltd.

Total Emissions of Class I Chemical Substances



■ Hofu Plant
■ Ube Plant
■ Fuji Plant
■ Sakai Plant
■ Yokkaichi Plant
■ Chiba Plant

ENVIRONMENTAL PERFORMANCE

●Dioxin Emissions

To comply with operations and maintenance standards for waste incinerators that will go into effect in December 2002, we are planning to update and remodel our incinerators. Incinerators that will be in operation from December 2002 include three at Kyowa Hakko and four at Kyowa Yuka, while subsidiaries and affiliates outsource incineration operations.

At present, the Fuji and Hofu plants are in the process of constructing incineration facilities, having gained the acceptance of their neighboring communities by publicizing the results of environmental assessments. We will pursue the meticulous management and disclosure of information in the operation of the incinerators.

●PCBs

In the past, we used transformers and condensers that used PCBs as an insulating oil. At present, this equipment is being stored in warehouses to prevent corrosion. The total volume of

PCBs being stored at all business sites is less than two tons, and the Kyowa Hakko Group makes periodic inspections to ensure against PCB leakage. In June 2001, special legislation for dealing with PCBs was enacted. We intend to carry out appropriate handling in accordance with this legislation for handling equipment containing PCBs.

●Limiting the Use of Substances that Damage the Ozone Layer

The Kyowa Hakko Group's utilization of CFCs, which damage the ozone layer, is limited to coolants packed in such equipment as air conditioners and freezing equipment. The Kyowa Hakko Group has formulated management standards and conducts maintenance inspections and carefully regulates CFC levels. We are committed to installing new equipment that uses a CFC substitute or ammonia or other coolant with minimal ozone depletion potential.



Autumn leaves of the "Kai no ki" at the Hofu Plant



Sanctuary for storks in the neighborhood of Agroferm

●Development of Environment-Friendly Technologies and Products

The Kyowa Hakko Group carries out technological and product development—particularly in the fields of biotechnology and chemistry—that supports environmental protection. An outline of some of the environmental protection activities at each of the Kyowa Hakko Group's in-house companies follows.

1) Environmental Protection Technology

●Wastewater Treatment Technology

In wastewater treatment plants, it is necessary to infuse a sufficient amount of oxygen into the activated sludge tank. This is usually achieved with blowers, which consume a significant volume of electricity. The Group has researched energy conservation and compact wastewater treatment technology, the results of which are in use at the Moji Plant's wastewater treatment plants. The unique feature of this technology is that it combines membrane tube diffusers that ensure fine-bubble-aeration with immobilization carrier treatment. The technology improves oxygen consumption efficiency more than twofold and conserves energy as well as expanding the treatment capabilities of the aerating tank. Highly efficient O₂ Magnum membrane tube diffusers are already being used in public



O₂ Magnum membrane tube diffusers
(Shingashi Treatment Plant, Tokyo Waterworks)



TS Analyzer
(Conducts ongoing measurements of sludge activity)

sewage treatment in Tokyo and Yamaguchi Prefecture, contributing to energy savings there. We are currently monitoring the physical properties of active sludge in the aerating tank using the TS Analyzer.

Inquiries: Kyowa Engineering Co., Ltd.

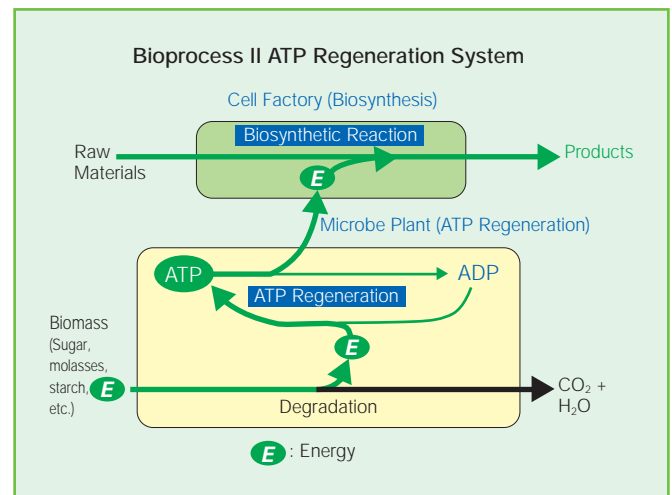
Engineering Department

Tel: 81-3-3512-5034

●Green Chemistry

Representing a promising new direction in technology, green chemistry uses recyclable raw materials as a substitute for oil resources to produce a variety of substances. The Group's microbial technologies, which have been cultivated over the years, serve as the foundation of green chemistry.

For example, we have minimized the use of expensive adenosine triphosphate (ATP), which is used as an energy source in biosynthesis, by using sugar, which is relatively inexpensive, in a process that enables the ATP to be regenerated and reused. This technology, which employs microbial bacteria, enables reactions under normal temperature and pressure, thus making it safe to use in making most complex compounds.



ENVIRONMENTAL PERFORMANCE

●Using Phytase to Improve the 21st Century's Poultry Industry

Adding the Bio-Chemicals Company's phytase, an enzyme that hydrolyzes phytic acid, to livestock feed, not only reduces up to of 30% of phosphoric acid excretion but, according to recent research, also enhances animals' absorption of minerals, protein, and amino acids.

Furthermore, as Kyowa Hakko's phytase is produced using a nongene recombination method, it contains various digestive enzymes that have been shown to enhance development by improving the nurturance of chicks and strengthening eggshells. Phytase is sure to play a leading role in the poultry industry of the 21st century.

Inquiries: Kyowa Hakko Bio-Chemicals Company
Sales & Marketing Department
Tel: 81-3-3282-0997

●Distillation Column with Vertical Partition

In partnership with Sumitomo Heavy Industries, Ltd., Kyowa Yuka has developed and put into use a new vertical partition-type distillation column. (See photo on page 26.) This distillation column consumes 30% less energy than conventional columns. This new technological development earned the SCEJ Technology Award from the Society of Chemical Engineers Japan in March 2002.

Inquiries: Kyowa Hakko Chemicals Company
Production Department
Tel: 81-3-3282-0057

2) Environment-Friendly Packaging Materials

●The Food Company's Stance on Packaging Materials

At the Food Company, we take the items below into consideration to ensure that our packaging materials are environment-friendly. These guidelines have been included on our Web site since December 2001.

1. Our first priority is quality and product safety.
2. We select packaging materials that reduce in volume and can be reused and recycled.
3. We constantly pursue the rationalization of packaging materials.

The publication *Phytase Kyowa*



フィチン酸分解酵素「フィターゼ」の養鶏現場への利用
リンやミネラル、アミノ酸の有効率改善に寄与

(1) 二一世紀の養鶏業のために

近年の地球環境保全対策の流れの中で、リン、窒素などの畜産排泄物由来の環境汚染物質削減は、避けて通れない大きな課題である。一般に養鶏家は消化率を持たないため、一部の養鶏・酪農家のように「水質汚濁防止法」の適用を受けないが、昨年制定された「家畜排せつ物の管理の適正化および利用の促進に関する法律」により、飼養の保管方法などについて規制を受けることとなる。

飼養の多くは堆肥化され土壌還元されるが、堆肥化が不十分な場合、これに含まれる多量のリン・窒素は、雨などによって河川や湖沼、地下水などに流出し富栄養化による赤潮、アオコ発生の一因となり、水産畜産業への経済的被害や飲料水水源の汚染などの問題を引き起こす可能性がある。

これら、環境汚染物質の一つである、リンの排出量を軽減するにはいくつかの方法が提案されているが、その一つが、フィチン酸分解酵素「フィターゼ」の利用である。フィターゼの利用により排泄リン量を最大で三〇％程度削減できることが、最近の多くの研究によって明らかにされている。

一般消費者の環境負荷削減排出に対する関心は年々強くなっており、二一世紀の養鶏業において、周辺環境に与える影響を可能な限り軽減することは、継続的な農場経営を考えると重要な課題といえる。

二、フィターゼとは

フィターゼとは、フィチン酸（フィチン酸）を加水分解する酵素の総称で、カビ、バクテリア、植物などに広く存在する。飼料用穀物では小麦、大麦、およびこれらの副産物であるフスマや米ぬか等にフィターゼ活性が認められるが、主原料となるトウモロコシや大豆にはほとんど含まれていない。

鶏や豚などの単胃動物はフィターゼを生産できないため、植物性飼料原料中のリン（〇を占める）をフィチン酸（フィチン酸）として、

協和発酵工業株式会社 開発部・岡田 徹

図 1 フィチン酸の模式図



フィターゼは、〇＝結合を加水分解します。

May 2002 volume of *Tori no Kenkyu* (Poultry Research)



Kokumi Seasoning LS
Gauzette-type film is used for polyethylene containers, reducing polyethylene usage 20% and thus reducing the volume of waste

●**Environmental Proposals by the Pharmaceuticals Company**
Three years ago, the Pharmaceuticals Company eliminated external boxes on all shipments, thereby reducing waste by approximately 33 tons per year and improving transportation efficiency. Furthermore, we have begun to mark packaging so that it is easier for patients to classify.

3) Environmental Proposals by the Chemicals Company

●Cross-Linkable Monomer for Waterborne Coatings

To improve indoor environments, waterborne coatings are used in place of conventional solvent-based paints, which are not environment-friendly. We are supplying a cross-linkable monomer (DAAM/hydrazide) for waterborne coatings that enables the formation of a strong paint film by undergoing a cross-linking reaction during drying.

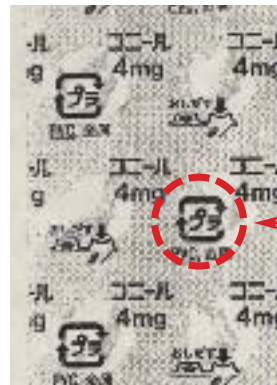
●Lubricant Raw Materials for Use as CFC Alternatives that Do Not Damage the Ozone Layer

CFCs, which have been widely used as refrigerants in freezers, cause significant damage to the ozone layer. This has led to growing demand for CFC substitutes. The Chemicals Company has developed synthetic fatty acids and PVE that serve as principal raw materials of lubricants for refrigerants used as CFC substitutes.

●Substitutes for CFCs and Chloride Detergents

Because of their combustion-resistant properties and stability, halogen-based solvents have been widely hailed as easy-to-handle detergents. On the other hand, because they are difficult to dissolve, these solvents' use has led to various environmental problems, including the destruction of the ozone layer and the accumulation of residual POPs (persistent organic pollutants). As an alternative, the Chemicals Company offers Kyowasol, a safe and environment-friendly detergent.

Inquiries: Kyowa Hakko Chemicals Company
Specialty Chemicals Department
Tel: 81-3-3282-0044

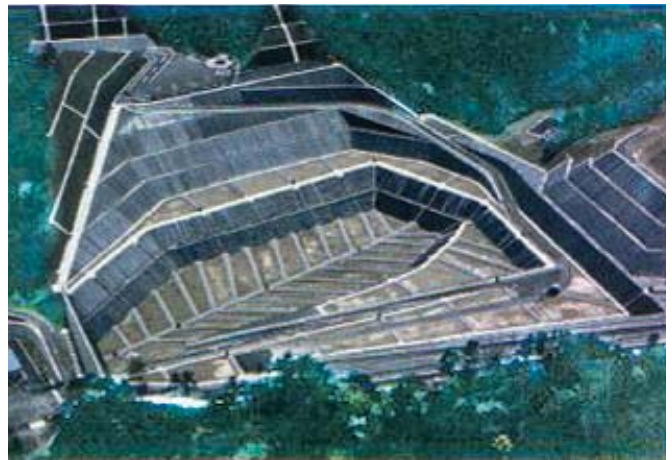


New packaging

Labeled clearly to make packaging materials easier to classify

●Landfill Liner for Waste-Disposal Sites

The Landfill Liner for waste-disposal sites, made using thermal plastic polyurethane, represents a technology that supports the operation of managed landfill sites. This liner, integrating leakage detection systems, is outstanding in terms of repair and maintenance and is effective in preventing various problems at landfill sites.



Landfill Liner being used at a waste-disposal site

●Use of CO₂ by Utilizing the Oxo Method

From the 1970s, the Yokkaichi Plant and the Chiba Plant have employed the oxo method, which enables the use of CO₂ in the manufacture of oxo alcohol. Oxo alcohol is used in the manufacture of such products as plasticizers and solvents. In fiscal 2001 alone, the total volume of CO₂ used amounted to less than 80,000 tons. The volume of CO₂ recovered accounts for 11% of the total volume of emissions of the Kyowa Hakko Group in Japan, and the Group is vigorously working to effectively use resources and prevent global warming.

ENVIRONMENTAL PROTECTION ACTIVITIES

Principal Environmental Management Activities

- 1964 Production of organic fertilizer using recycled fermentation mother liquor at the Hofu Plant
- 1968 Wastewater treatment facility introduced at the Hofu Plant
- 1971 Wastewater combustion facility introduced at the Yokkaichi Plant
- 1973 Creation of Safety and Environmental Management systems at Kyowa Hakko and Kyowa Yuka
Acetaldehyde removal facility introduced at the Yokkaichi Plant
- 1975 Wastewater treatment facility introduced at all Kyowa Hakko and Kyowa Yuka plants
Flue gas desulfurization equipment introduced at the Yokkaichi Plant
- 1977 Kyowa Hakko won first Director General of the Environment Agency Award
- 1979 Introduction of biodenitrification and dephosphorization process to wastewater treatment facilities
- 1981 Under a Companywide energy conservation project, Kyowa Hakko achieved a 20% reduction in energy use
- 1993 Formulation of policies for environmental protection
- 1996 Implementation of Responsible Care
- 1997 Recycling of *shochu* distillate begun at the Moji Plant, Kyowa Hakko ended ocean dumping
- 1998 Vast reduction of COD levels in wastewater
Installation of cogenerator at the Chiba Plant
- 1999 Implementation of deodorizing facilities at the Hofu Plant
Publication of the *Health, Safety, and the Environment Report*
Installation of new organic fertilizer production facility under the energy-saving and environmental protection systems
- 2000 Enhancement of NO_x removal facility at the Yokkaichi Plant
Received ISO 14001 certification at eight Kyowa Hakko and Kyowa Yuka plants
- 2001 Installation of low-NO_x burners, fortified SO_x measures
ISO 14001 certification of Kyowa Medex's Fuji Plant
Affiliates began construction of EMS based on ISO 14001 standards

Principal Achievements in Product and Technology Development

- 1970 Contributed to meat production with amino acid additives for stock feed
Used an oxo process to recover CO₂
- 1981-1986 Participated in a MITI-sponsored national research project on converting unused biomass into fuel oil
- 1993 Developed and commercialized Landfill Liner, polyurethane sheets for final waste-disposal sites
Developed and commercialized cleaner and new raw lubricant for refrigerant used as CFC substitute
- 1996 Developed and commercialized phytase, an enzyme used in feed additives to prevent environmental damage caused by the livestock industry
- 1997 Commercialized a new manufacturing method for hydroxyproline, an amino acid that uses no collagen and causes little environmental damage
- 1997 Simplified and reduced the volume of packaging used for pharmaceuticals and foods
- 1998 Through joint research with Tsuji Oil Co., Ltd., developed and commercialized a process that converts *shochu* distillate into animal feed
- 1999 The Japan Scientific Feeds Association presented Kyowa Hakko with the Technology Award in recognition of the Company's efforts, through its business activities in amino acids and enzymes for feed additives, to promote the development and wide usage of feeds that reduce environmental impact.
Shifted to easy-to-recycle materials for PET bottles for *shochu* products
Promoted elimination of metal cans by the Bio-Chemicals Company
- 2000 Marketed an organic wine with no additives
Promoted environment-conscious packaging, such as that eliminating outer packaging materials for medical products
- 2001 Developed and implemented new dichloromethane-free production process
Developed cross-linkable monomer for waterborne coatings using diacetone acrylamide and diethyl glutaric acid
- 2002 Distillation column with vertical partitions won the SCEJ Technology Award from the Society of Chemical Engineers Japan

GLOSSARY

COD.....	Chemical Oxygen Demand Amount of oxygen required to chemically oxidize organic pollutants in wastewater
DEHP.....	Diethylhexyl phthalate (plasticizer)
DINP.....	Diisononyl phthalate (plasticizer)
GRI.....	Global Reporting Initiative A long-term initiative involving various parties, incorporating Sustainability Reporting Guidelines for global application, which are adopted voluntarily by organizations that report on the economic, environmental, and social aspects of their activities, products, and services
HPV.....	High-Production Volume An OECD measurement intended to aid in the control of chemical substances introduced as part of its inspection program into the health and environmental impact of chemicals in which safety testing data from cases where chemical substances are produced in large volumes is used to appraise product safety
LCA.....	Life Cycle Assessment Method of comprehensively assessing impact on the environment of a product based on an analysis of the entire production process from procurement of raw materials to manufacture, use, and disposal
MSDS.....	Material (or Product) Safety Data Sheet Documentation that specifies the degree of hazardousness and carrying special warnings concerning chemical substances, these documents are exchanged by parties to a transaction involving chemical substances
OSHMS.....	Occupational Safety and Health Management System An international standard for establishing organizations and accountability structures for management of labor, health, and safety
PRTR.....	Pollutant Release and Transfer Register System in which data related to the release and transfer of specially designated chemical substances is reported by companies handling them to administrative authorities that collect and make public the data
Sustainability.....	Pattern of sustainable development that satisfies the needs of the present generation without impairing the ability of future generations to likewise satisfy their needs. At the 1992 Earth Summit, the Agenda 21 action plan for sustainable development for mankind was adopted.

For further information, please contact:

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The next *Safety, Health, and the Environment/Sustainability Report* will be published in September 2003.

KYOWA HAKKO KOGYO CO., LTD.

1-6-1 Ohtemachi, Chiyoda-ku, Tokyo 100-8185, Japan



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October 2002
Printed in Japan

We would like to hear your opinions and impressions concerning this report.

Every year, Kyowa Hakko publishes this *Health, Safety, and the Environment/Sustainability Report* with the aim of publicizing its environmental protection achievements as widely as possible. To foster a deeper understanding of these activities, we take pains to ensure that the contents of the report are easily comprehensible but recognize that areas for improvement remain.

In that connection, we would be very grateful if readers of this report would take the time to submit their opinions and impressions. Such input would be useful in our future activities and serve as a reference point as we enhance the disclosure of our environmental activities.

We would therefore be very grateful if you could fill in the questionnaire on the reverse of this sheet and fax it to Kyowa Hakko's Corporate Safety and Environmental Management Department.

September 2002

Kyowa Hakko Kogyo Co., Ltd.
Corporate Safety and Environmental Management Department
Fax: 81-3-3282-0030

Questionnaire

Q1. How did you hear about the 2002 *Health, Safety, and the Environment/Sustainability Report*? (Please circle as appropriate)

- | | |
|--------------------------------|----------------------------------|
| 1. Newspaper article | 5. At a seminar or similar event |
| 2. Magazine article | 6. From a friend or acquaintance |
| 3. Kyowa Hakko home page | 7. Other (please specify) |
| 4. From a Kyowa Hakko employee | |

Q2. In this year's report, all Group activities including overseas production bases were included. How easy was it to understand?

- | | | | |
|--------------|---------------|------------|--------------|
| 1. Very easy | 2. Quite easy | 3. Average | 4. Difficult |
|--------------|---------------|------------|--------------|

Q3. Did any item in particular strike you? (Please circle as appropriate)

● Environmental and Safety Management System

- | | |
|---|--|
| 1. Environmental and Safety Management Organization | 4. Safety and Environmental Education |
| 2. Management System | 5. Environmental and Safety and Product Safety Assessments |
| 3. Environmental and Safety Auditing | 6. Environmental and Safety Risk Management |

● Social Performance

- | | |
|---------------------------------------|---|
| 1. Preserving Safety and Health | 5. Environmental Assistance Activities |
| 2. Coexistence with Local Communities | 6. Employees |
| 3. Making Science Accessible | 7. Social Considerations Related to Safety and the Environment in the Pharmaceutical Business |
| 4. Arousing Interest in Science | |

● Environmental Performance

- | | |
|--|--|
| 1. Environmental Accounting | 3. Environmental Protection Activities |
| 2. Material Balance and Environmental Accounting by In-House Companies | 4. Development of Environment-Friendly Technologies and Products |

Q4. Please indicate what aspects of this report you thought good, inadequate, or in need of further improvement.

Q5. In what ways do you expect us to improve our environmental protection activities and safety management? If possible, please be specific.

Thank you for your cooperation.

To further help us with this questionnaire, could we ask you to supply the following personal details?

Name _____

Place of work (organization) _____

Is it best to contact you at home or work? _____

Telephone No. _____

Fax No. _____

E-mail address _____

E-mail: corporate-communications@kyowa.co.jp

Fax: 81-3-3282-0030

Corporate Safety and Environmental Management Department
Kyowa Hakko Kogyo Co., Ltd.