



Tokuyama Corporation

Environmental Report

A Statement of Our Commitment
to the Environment and Safety and Health

Responsible Care **2002**

Editorial Notes

This Responsible Care Report 2002 has been prepared for the purpose of making Tokuyama Corporation's commitment to the environment and to safety and health and its efforts on these issues in fiscal 2001 widely known to all concerned, its shareholders, investors and its customers as well as its employees and their families and the neighboring communities and all citizens. In the preparation of this report, reference has been made to the Guidelines for Environmental Reports (2000 Edition) of the Ministry of the Environment.

Scope of Report

Period covered by the Report : From April 2001 through to March 2002
Company featured in the Report : Tokuyama Corporation
Area covered by the Report : Japan as a whole



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Basic Policy

As a member of the Japan Responsible Care Council, Tokuyama Corporation carries out Responsible Care activities that protect the environment and preserve safety and health throughout the entire chemical substance life cycle from development to manufacturing, distribution, use, final consumption and disposal. Our social mission is to aggressively tackle and solve environmental issues in particular, which will in turn, drive sustainable corporate development. Based on this recognition, we are promoting environmental management, which is a management policy that emphasizes the environment, in all of our business activities, including development, manufacturing and sales.

Action Objectives

- 1. To promote environmental protection.**
To employ environmental management systems in accordance with ISO14001 and reduce environmental impacts.
- 2. To faithfully observe laws and regulations.**
To faithfully observe international rules, domestic laws and regulations, and industry standards.
To thoroughly practice internal export control rules.
- 3. To promote energy conservation and curb global warming.**
To achieve the lowest unit energy consumption in the industry for all of our products.
- 4. To promote resource recycling and work toward reduction and proper management of waste materials.**
To promote material recycling and thermal recycling of resources.
To promote office paper reduction.
- 5. To promote safety, disaster prevention, and occupational health and safety.**
To aim for zero accidents and disasters based on the principle of self-management to safety and responsibility.
To ensure a comfortable work environment and preserve safety and health.
- 6. To ensure strict product safety standards.**
To provide products that have little impact on the environment and can be used safely.
To provide appropriate information on how to use products properly, precautions, etc.
- 7. To deepen our trusting relationship with society.**
To disclose information regarding our activities in the areas of the environment, safety and health.
To actively carry out dialogue with local communities.

Activity Goal

- Achieving a 15% reduction in the 1990 unit energy consumption by the year 2005.
- Achieving a 92% improvement in the effective waste utilization rate by the year 2005.

Message from president

Promoting environmental management to fulfill our important roles in the recycling-oriented society to come and establish a unique corporate presence recognized by our customers and society at large.

The mass-production, mass-consumption and mass-abandonment society of the 20th century has left a legacy of world-spanning environmental problems that are facing us today. In response to these challenges, our mission in the 21st century is to create the "sustainable and recycling-oriented society." While, as a chemical manufacturer, we have contributed much to the improvement of living standards and our general prosperity by supplying a wide range of chemical products, we have also recognized the substantial need to ensure that our corporate activities and our products will not lead to environmental problems and jeopardize human health.

Based on this recognition, Tokuyama Corporation has actively participated in the Japan Responsible Care Council since it was founded in 1995 and embraced a firm commitment to Responsible Care activities.

The concept of "Environmental Management" has played the key role in our management strategies under the midterm management plan that started in fiscal 1999. "Environmental Management" is a management approach that takes environmental considerations as important concerns. In this sense, it is our mission to integrate environmental protection into all our activities, from research and development through the production process to the distribution and sale of our products, and thereby enhance the value of our company and contribute to the realization of the sustainable society.

Japan is fully committed to the realization of the zero-emission society in a rapid process of transition to a recycling-oriented structure of society. We as a Japanese company are intent on playing our roles in "closing the loop of the society."

In all our production activities, we have maintained a resolute commitment to recycling by-products and wastes. As part of this endeavor, the Resource Recycling and Environmental Business Department was created in 2000. The importance we attach to the environment as a business proposition can be seen in the way we accepted as much as 1.59 million tons of external

industrial byproducts and wastes for use in our cement-making plant in fiscal 2001 alone. By putting our environmental commitment to practicing in this manner, we have been successful in achieving a "trickle down effect" that has let the principles of "Environmental Management" take root at the grassroots level of our workforce.

As we reach out into the future, we will hold steadfast commitment to playing our role in creating a "sustainable society" and to distinguishing ourselves a unique company appreciated by our customers and by society.



Shigeaki Nakahara,
President
August 1, 2002

S. Nakahara

Looking back on our activities to reduce environmental impacts in fiscal 2001 as a way of bolstering our efforts in fiscal 2002.

***Green Procurement**
The purchase decisions for products and services are governed not only by considerations of price, quality, convenience and design but also preference given to goods and services with the least possible environmental impact.

***Pollutant Release and Transfer Register (PRTR)**
The system of compiling and disclosing data that provide an accurate account of the origins of harmful chemical substances, the emission levels in the environment, and their levels contained in the wastes that are released from the plant.

***Dust**
The particulate matter referred to as fly-ash includes soot and ash particles contained in the smoke released from the flue stack.

The overview below gives an account of the activities we have undertaken to reduce environmental impacts in fiscal 2001 and their results. For a more detailed assessment and for the effective management of the results of our activities, we have set specific environmental impact reduction targets for each plant. Moreover, we have launched company-wide activities such as energy conservation, waste sorting and recovery, and green procurement* that are also binding on our Head Office and Branch Offices.

In the context of our ongoing environmental efforts, we have determined reduction targets that will see us through to the end of 2005 in an unwavering commitment to maintaining these endeavors and achieving our targets.

Environmental Activity Targets and Achievement Records for Fiscal 2001

In fiscal 2001, we engaged in a sweeping range of environmental management activities focusing on pollution prevention, measures against global warming, reduction of wastes, and PRTR*. Our specific efforts in this regard include reduction of dust* emissions through more intensive exhaust gas treatment and dust collection, recycling of external wastes, and a reduction in harmful substance emissions.

In addition to the installation of exhaust gas treatment and dust collection (precipitation) systems, we have focused attention on the optimum operation of the environmental protection facilities in an effort to reduce environmental impacts more effectively. In terms of recycling, we have made significant progress in our material and thermal recycling efforts by separating solids contained in our effluents and effectively using the recovered solids as a raw material for cement and by recovering waste heat for steam generation and reuse.

Activity	Details		Unit	Target	FY2000	FY2001	Difference against pre-activity year
Pollution prevention	Atmosphere	SOx	t / y		1,830	2,260	+430
		NOx	t / y		9,750	10,800	+1,050
		Dust	t / y		214	179	-35
	Water quality	COD	t / y		129	128	-1
Measures against global warming	Energy conservation	Reduction in unit energy consumption index (as compared with 1990)	%	-15	-11	-11	0
Reduction of wastes	Recycling	Rate of effective waste utilization	%	92	91	91	0
PRTR	PRTR (Jap.Chem.Ind.Assoc.)		t / y		394	398	+4
	Harmful atmospheric pollutants		t / y		53	53	0

Environmental Accounting as a tool for achieving effective environmental investments.

We introduced Environmental Accounting in fiscal 2000 as the means to assess and analyze the investments and costs required for environmental conservation and the benefits derived from them. This has helped us achieve greater effectiveness in our environment-related investments and has proven to be a vital element in maintaining sound and sustainable business operation. Environmental Accounting* with the accumulation of evidential data thus provides an essential management tool to enable us to be

more effective in our environment-related investments.

Main Environmental Investments in Fiscal 2001

As part of our efforts to reduce environmental impacts at our plants, we have installed exhaust gas treatment and waste treatment facilities. We have also built a general effluent treatment facility for separating and recycling the solids contained in our plant waste water.

***Environmental Accounting**
A clear recognition of the costs required for the environmental protection measures undertaken in business activities and of the benefits achieved as a result helps to make a quantitative assessment that is made public.

FY2001 Environmental Protection Costs

Type of Environmental Protection Costs	Main measures undertaken	Investment amount (Unit: Million yen)	Total costs (Unit: Million yen)	
On-site Costs	Pollution prevention	Installation of exhaust gas/effluent treatment facilities, noise prevention measures, dust collection, etc	505	3,646
	Measures against global warming	Installation of waste heat recovery systems, etc.	34	18
	Material Recycling	Extension of general effluent treatment plant (recovery of solids) and promoting the use of waste materials	463	975
Upstream/downstream costs		0	-	
Costs for Management activities	Installation of environmental measuring and detection equipment	42	255	
Research and development costs	Development of waste treatment technology	20	368	
Costs of community activities	Factory greening	47	41	
Costs of environmental damage	Levies, Disused Mine Area Administration	0	196	
Total		1,111	5,499	

*Data compiled in accordance with the Ministry of the Environment Guideline for Introducing Environmental Accounting Systems.
*The data cover all manufacturing plants of the company.

Economic Benefits

Item	Material Benefits	Economic Benefits (Unit: Million yen)
Reduction benefit due to energy saving	Electric power/steam	138
Benefit from sales of salable materials	146,000 tons	111
Benefit from reduction in waste treatment costs	89,000 tons	301
Benefits from reduction in material/fuel consumption due to waste recycling	92,000 tons	178
Total		728

Establishment of an Organization Headed by the RC Administration Committee and Capability of Effectively Executing Environmental Measures without Delay.

In 2001, we established our midterm (three-year) environmental plan which comes into effect in 2002. At the same time, we have reviewed our midterm environmental impact reduction targets. We have also created a new Committee for Product Safety and Quality Assurance within our RC Promotion Organization. It is responsible for the overall companywide management of the safety to our products and their quality.

Promotion Organizations

The supreme decision-making organization on issues related to the company's general RC activities is the RC Administration Committee. Chaired by the President of Tokuyama Corporation, its sessions take place in the presence of the members of the company's top-management to adopt basic policy decisions and measures related to issues such as the environment, safety and product quality.

Appointed to preside over the Committee as committee chairmen have been the board directors who have overall management authority in the environmental, safety and quality areas. The committee mem-

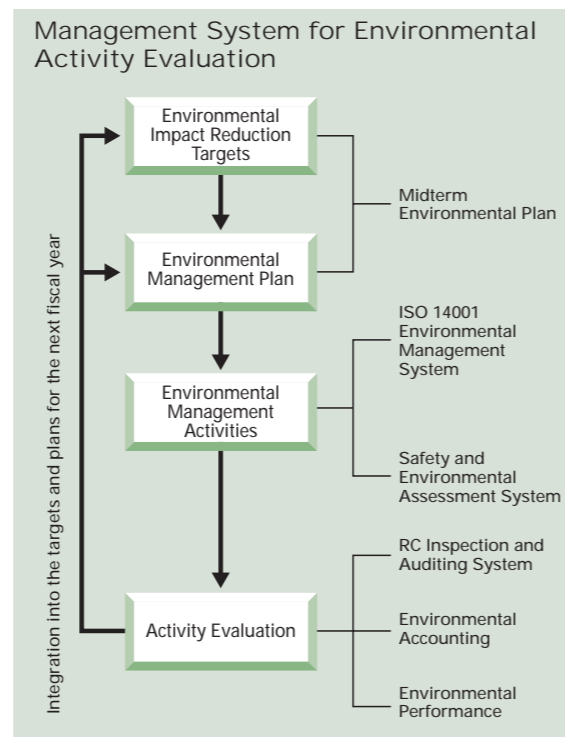
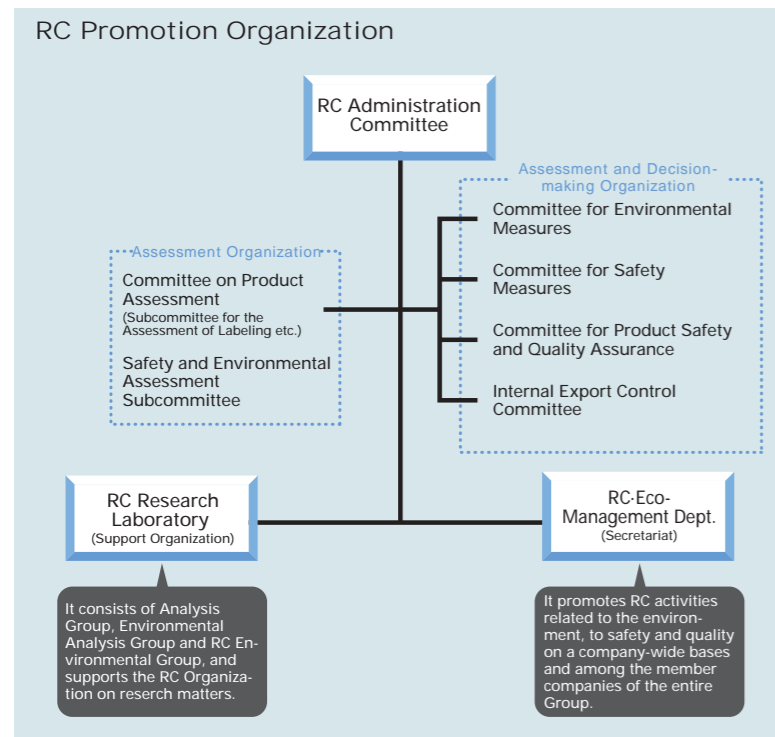
bers are appointed from the ranks of department managers in charge.

The Safety and Environmental Assessment Subcommittee has been appointed as a sub-organization of the Committee for Safety Measures. Its task is to assess the safety and environmental performance of newly installed equipment.

With effect from fiscal 2001, the Committee for Product Safety and Quality Assurance has been instituted. It is responsible for the overall management of product safety and quality on a companywide basis and has decision-making powers to investigate and determine companywide policies and targets in the area of product safety and quality management.

Management System for Environmental Activities and their Evaluation

In the process of achieving the midterm environmental plan, a system is in place under which policies and targets are defined each fiscal year and specific action programs are established on the basis of these policies and targets for each division. The activity results are evaluated at the end of each fiscal year and integrated into the plan for the next fiscal year.



ISO 14001 Environmental Management System

Our Tokuyama and Kashima Factories have both acquired ISO 14001* certification for their Environmental Management Systems. In accordance with the companywide environmental policy directions, environmental policies and targets are determined for each factory to provide the basis on which activities are implemented for environmental impacts reduction, energy conservation, waste reduction, and resource recycling.

For the current fiscal year, new midterm targets for environmental impact reduction have been determined for each factory.

The member companies of the Tokuyama Group (our subsidiaries and affiliates) have either acquired ISO 14001 certification for their Environmental Management Systems or are in the process of promoting the introduction of simple management systems.

ISO 9000s Quality Management System

We have acquired ISO 9001* Quality Management System Certification for our main products. Based on our Quality Management System we strive to provide our customers with the quality they require and expect. In 2001, we have expanded the scope of our Quality Management System to include, among other things, vinyl chloride monomer. Furthermore, we have made preparations since 2001 toward compliance with the amended 2000 version of ISO 9001.

Assessment Systems

We have instituted a full range of assessment systems in an effort to reduce environment, safety and health related risks. The body responsible for the assessment works consists of the Committee on Product Assessment and the Safety and Environmental Assessment Subcommittee.

[Safety and Environmental Assessment] Safety can be only achieved when the work operations and the equipment are secured. Whenever new production equipment is installed or existing equipment extended or modified, the practice is to conduct safety and environmental assessment beforehand. The objective of these safety and environmental assessments are to assess the safety of the equipment design, the safety of the materials handled, the existence of an

appropriate response measures to emergency, and compliance with the legal regulations to ensure that each equipment is safe and easy to operate, maintenance-friendly and free from accidents.

[Product Safety and Labeling Assessment]

To verify the safety of our products, product safety assessments are carried out from a comprehensive range of criteria and at all stages from the research and development and design phases to the marketing of our products. (See Flow of Safty Assessment Process on p. 12.)

Inspection and Auditing System

In accordance with companywide policies, a system has been established for inspecting and auditing to observe whether all factories are implementing appropriate activities.

[Safety, Environment and Quality Related Inspection]

Each year inspection procedures related to safety, environment, and quality management are carried out at all factories to assess whether the RC activities are implemented in the proper manner.

The inspections are carried out to investigate whether the activities of the safety, environment, and product quality are carried out at the production and related administration departments in the proper manner. If problems are discovered, they are advised with instructions for improvements. The implementation of these inspections is an important part of our efforts to reinforce and upgrade our management system on a companywide basis.

[Internal and External Auditing]

In accordance with the ISO 14001 Environmental Management and ISO 9001 Quality Management Systems, internal auditing is exercised regularly at each factory. In addition, all factories are inspected by external or third-party auditors from Registered Inspection Organizations.

Promotion of Green Procurement

Green Procurement is recognized by both the government and companies as essential for achieving the recycling-oriented society of tomorrow. We embrace a positive commitment to green procurement as can be seen from the fact that we have established the Green Procurement Standards and are already practicing green procurement in purchasing copying paper and stationery.

*ISO 14001
This international standard was established by the International Standardization Organization (ISO) for Environmental Management Systems. It is not the type of standard that prescribes the mere adherence to certain standard values that have been decided as is the case with pollution regulation measures. Instead, it makes a Certification Organization to certify the results that are achieved by a company defining its own targets for its efforts to reduce environmental impacts and training human resources and developing a system for attaining these goals.

*ISO 9001
This international standard for quality management and quality assurance was established by the International Standardization Organization (ISO). The objective of this standard is to obtain customer satisfaction by establishing a reliable quality system within the corporate organization.

We are committed to recycling wastes and byproducts not only from our own plants but also from outside.

***Cement Kiln**
Cement kilns are used for sintering the materials in the cement plant.

***Material Recycling**
Material recycling involves the reuse of wastes and byproducts as materials. Cement plants use slag, coal ash, sludge and incineration ash generated both internally and externally.

***Thermal Recycling**
Thermal recycling involves the reuse of wastes as a source of heat. Cement plants accept in-house and external plastic wastes, waste tires and other wastes and use them as a fuel.

Our cement plant reuses a large quantity and variety of wastes and byproducts of both internal and external origin.

Many of the wastes and byproducts contain the same components as those of the raw materials used for cement such as limestone, clay, and silica. They can therefore be used as materials for cement.

Cement kilns are operated at extremely high temperatures in the range of 1000 - 1800°C. Under these conditions, all combustible components are completely combusted. The ash residues remaining in the kiln after combustion is used as a raw material for cement.

The waste and byproduct components are thermally recycled to make use of their heat energy and materially recycled for effective reuse as raw materials. In this manner, the cement plant can make a substantial contribution to achieving the recycling-oriented society to come.

Accepting wastes and byproducts at the cement plant

Since our debut in the cement sector in 1938, we have adhered to the practice of accepting various industrial wastes of internal and external origin for use as raw materials for cement or for using their heat content as a fuel for our cement kilns. This has made a significant contribution to achieving the recycling-oriented order of society in the sense that it allows the effective use of the world's limited resources.

In fiscal 2001, as much as 1.82 million tons of wastes and byproducts were reused at our cement plant. This includes a total of 1.77 million tons used as alternative raw materials (material recycling*) and 50,000 tons used as alternative fuels (thermal recycling*).

In fiscal 2001, the amount of wastes and byproducts accepted by our cement plant for reuse from outside the company accounted for 1.59 million tons.

Accepting a Wide Range of Wastes

[Waste Plastics]

We accept plastic wastes and use them as a fuel for our cement kilns. Construction work to extend the crusher plant that converts the plastic wastes to a fuel material was completed in June 2001. Through this project, the plant's annual throughput capacity has been substantially increased to 45,000 tons.

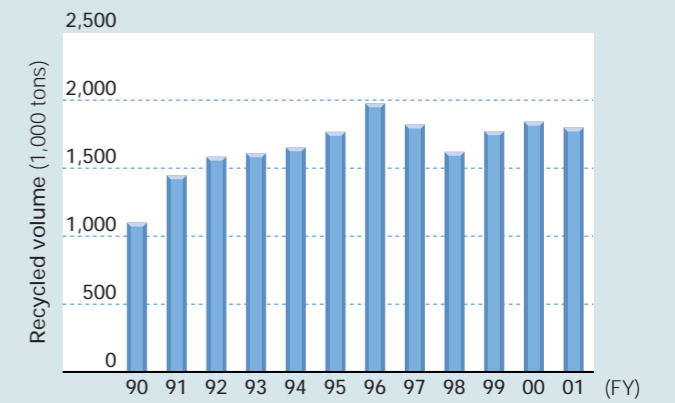
[Waste Tires]

We accept cut tires and use them as a fuel for our cement kilns. In 2001, we recycled a total of 7,000 tons of tires.

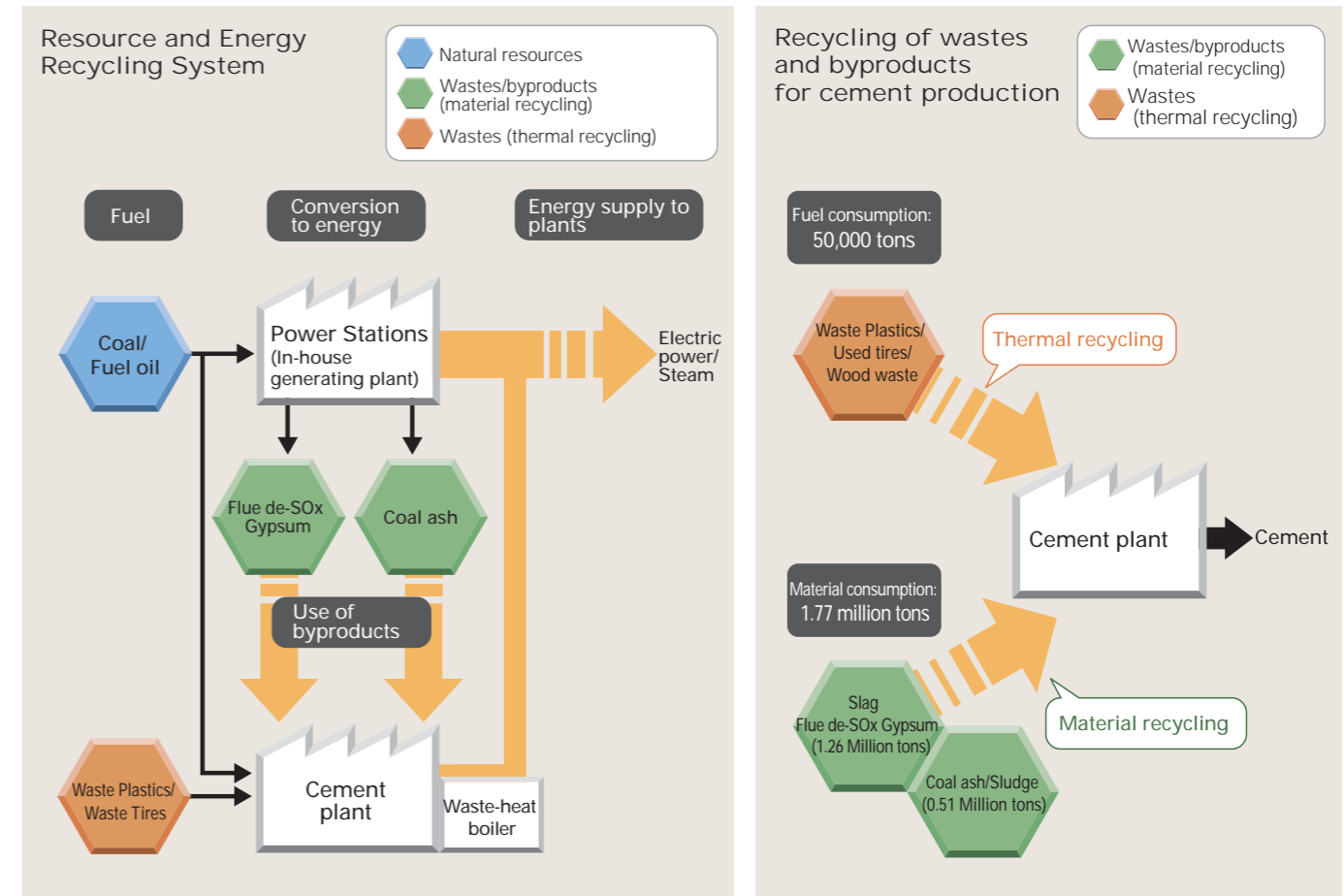
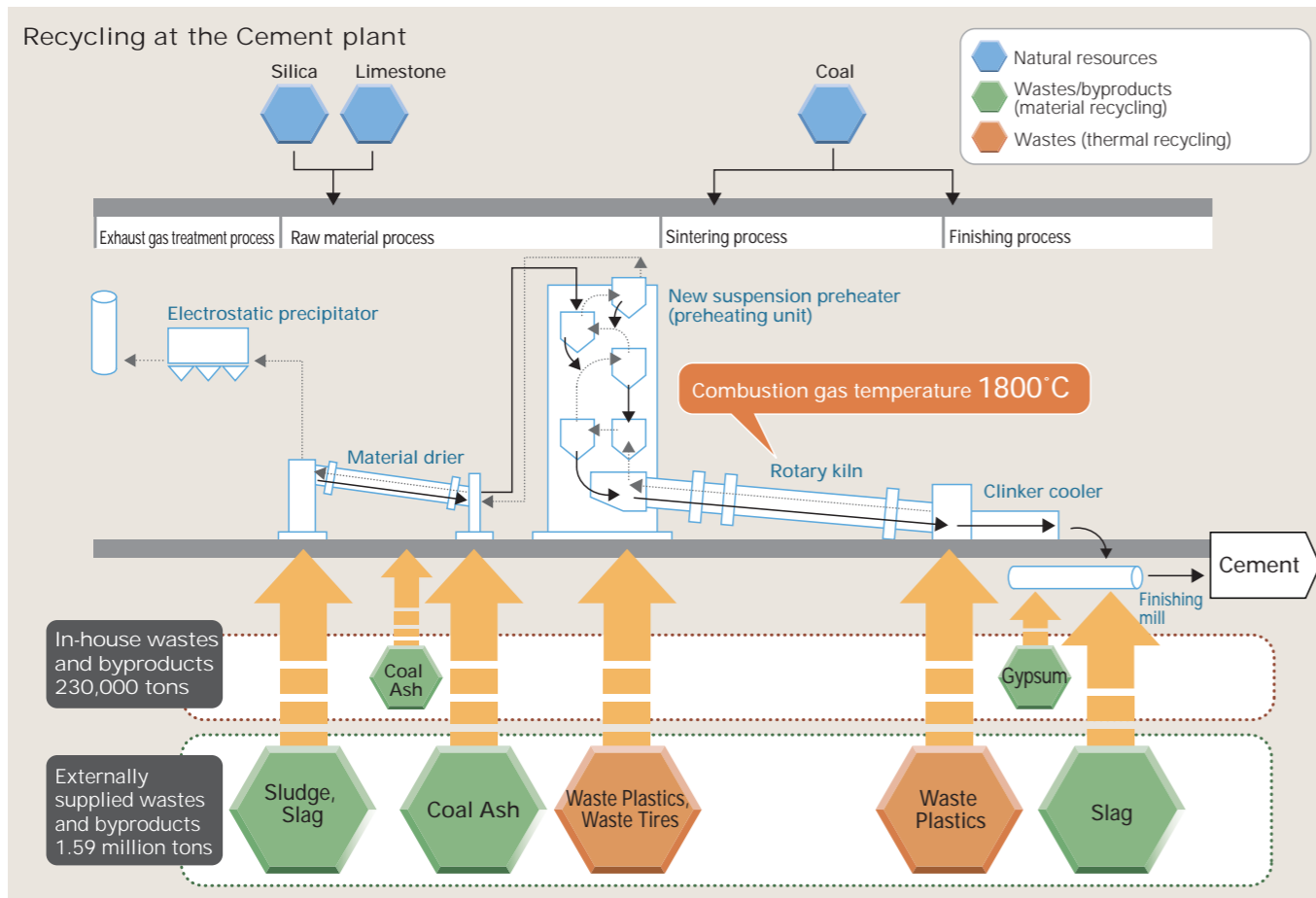
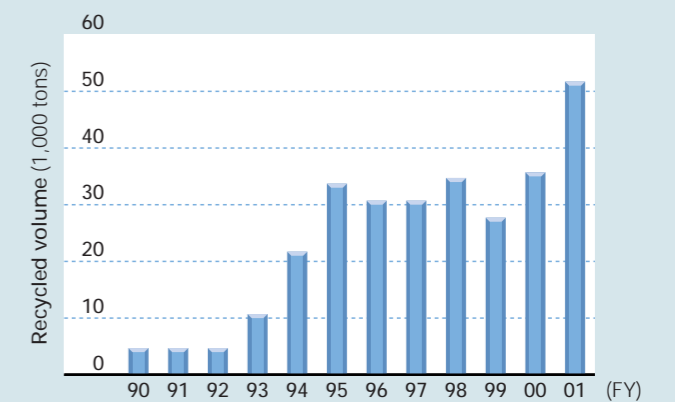
[Coal Ash/Sludge]

The combustion residues (coal ash) emitted from thermal power stations and the sewerage sludge emitted from the municipal and rural sewage treatment plants are used as alternative materials. In 2001 alone, we recycled a total of 510,000 tons.

Changes in Material Recycling Volumes at Cement plant



Changes in Thermal Recycling Volumes at Cement plant



Making our products and technologies more environment-conscious is our way of contributing to the protection of the environment.

Our efforts to protect the environment go beyond energy saving and the reduction of waste emissions and strike deeper in the development of products and technologies with reduced environmental impacts. Through the supply of environmentally aligned products and the development of environment-conscious technologies, we fulfill our mission of contributing to the realization of a recycling-oriented society.

Natural Material for Interior Decoration Plaster Sheet 「SHINPU」

Concentrating on the unique features of plaster such as humidity control, fungicidal action and fireproof properties, we have developed the plaster sheet with the benefit of our proprietary molding technology to a product that can be as easily applied as ordinary wallpaper. The outstandingly flexible SHINPU Sheet has a three-layer structure consisting of non-hardened plaster filling (slaked lime) sandwiched between a protective sheet and a base paper. It can be applied to the interior walls and ceilings of the room without difficulty. After application, the plaster reacts with the carbon dioxide in the air to form plaster (calcium carbonate).

Through this reaction, the plaster will harden to provide a highly durable wall covering that is tough and will not peel off.



Interior finish using the SHINPU Plaster Sheet

Energy and Resource Saving - High-efficiency Thin Electrolysis Cell

Our TNE-330 electrolysis cell was installed at our electrolysis plant in August 2001. Combining our proprietary zero-gap and electrolytic cell* technologies for the electrolysis of sodium chloride, it marks a dramatic improvement in energy consumption to its predecessor models. Its compact and thin construction helps to substantially reduce the structural resistance of the cell and the power requirement for electrolysis. We have also achieved savings in materials for the cell. Compared with the world's most advanced electrolytic cell, the TNE-330 can achieve power saving in the order of 5% or more. We are also considering the possibility of transferring this technology to other companies.

Energy-saving Construction Material 「SHANON」

Our plastic sash SHANON is a PVC window frame product. It uses a plastic with a superior thermal insulating effect for windows as the open part of the house. Its panes are double-glazed for more effective thermal insulation. This prevents dew condensation in the winter and provides a superior sound barrier.



Section view of plastic sash SHANON

Progress in Liquid Waste Treatment - Recovery of Usable Components - Electric Dialysis and Diffusion Dialysis Equipment

Our NEOSEPTA is an ion exchange membrane capable of selective ion permeation*. Our electric dialysis and diffusion dialysis units with a built-in NEOSEPTA are used for separating and recovering the acid and usable components contained in the liquid wastes from electroplating plants and for recovering the liquid wastes from the stainless steel production process. The system has already established a proud record for itself. Most recently, a new application has been developed for the removal of salt from the seepage water of waste incinerator ash landfills and for the removal of nitrate ions from groundwater.



Electric Dialysis Plant

Environment-Conscious Standard Water System Detergent YUTORUNA

The standard water system detergent YUTORUNA has been developed with the benefit of our know-how and experience we have gained over the years. The chemicals contained in the detergent components have been selected for minimum impact on both the environment and the human body. YUTORUNA can be used as a non-rinse detergent so that detergent emissions into the environment are effectively minimized. Compared with the conventional solvent systems, YUTORUNA has a much smaller environmental impact.

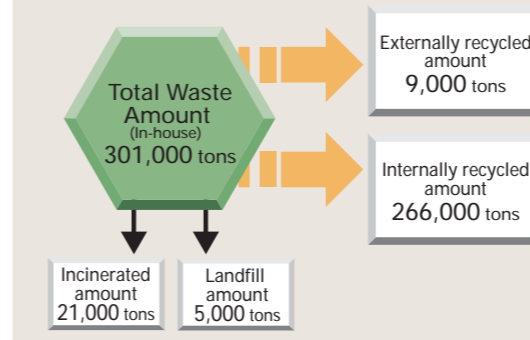
*Ion exchange membrane
The ion exchange membranes have the capability of selectively letting through certain ions. They can be divided into two major categories: cation and anion exchange membranes. With an ion exchange membrane, it is possible to separate cations and anions under the action of an electric current. The many diverse features of ion exchanger are utilized to advantage in many fields.

*Electrolysis Cell
This unit consists of electrodes, an ion exchange membrane, and an electrolyte (fluid). The products obtained in the electrolysis of salt (sodium chloride) are chlorine and caustic soda.

Using wastes to full advantage is our way of reducing landfill disposal.

In fiscal 2001, the amount of wastes generated in-house totaled 300,000 tons/year. Our target for the period up to 2005 is to achieve an effective waste utilization rate of 92%. Practically the most of waste volume from our plants is reused as raw materials for cement. While the remainders are disposed of on landfills or by incineration, the amount of wastes disposed of on landfills is being reduced as our efforts to increase waste reuse are intensified.

Breakdown of In-house Waste Treatment



PCB Waste Management

The Tokuyama plants have a system in place to ensure the proper storage and management of transformers and high-voltage capacitors that contain PCB*. We also instruct the member companies to the Tokuyama Group to make provisions for the proper management of high-voltage capacitors containing PCB.

*PCB
PCB is genetic name of toxic organic compounds with a structure resembling that of DDT. It is the causal agent responsible for the Kanemi Oil Disease Accident. It releases dioxins on burning. Because of its superior heat and chemical resistance and its outstanding insulation properties it has been used for capacitor insulation. In 1972, its production was discontinued and manufacturers and factories were compelled to store the PCB-containing transformers and capacitors that had already been on the market.

Changes in Effective Waste Utilization Ratio



topics

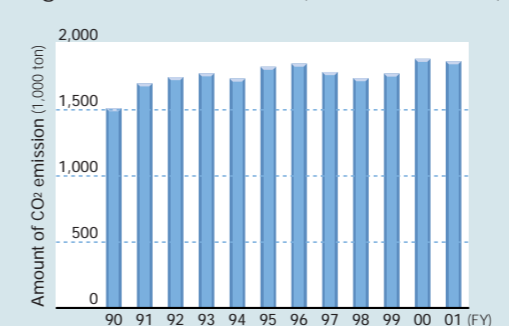
Our commitment to the prevention of global warming

We use a large amount of energy in the manufacture of caustic soda and cement. Our boilers for in-house power generation as well as the cement kilns are main sources of our emissions of the greenhouse gas carbon dioxide. With the Kyoto Protocol* soon coming into effect, we recognize the need for taking action to prevent global warming as a particularly important issue.

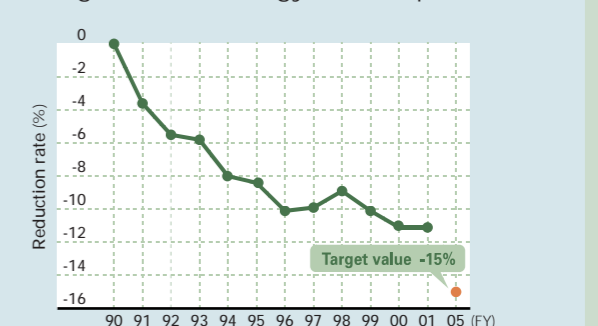
The Tokuyama Factory, our main production site, is committed to energy conservation and works towards the target of a 15% reduction in unit energy consumption by the year 2005 as compared with the reference year 1990. In fiscal 2001, it actually achieved an 11% reduction in unit energy consumption. Despite its increased production output, it has been able to keep down carbon dioxide emissions through a range of energy savings activities.

*Kyoto Protocol
The Kyoto Protocol defines the reduction targets for greenhouse gas emissions to be achieved by the leading industrialized nations over the target period from 2008 - 2012. The Protocol was adopted at the 3rd Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP3) held in Kyoto in December 1997. Japan has accepted a reduction target of 6% (as compared with 1990).

Changes in CO₂ Emission (Converted to C)



Changes in Unit Energy Consumption Index



Our business efforts have produced a proud result of emission reductions for environmental pollutants.

From a very early time, We have made our efforts to quantify the environmental impacts on the atmosphere and aquasphere of emissions and wastes mainly from our power plants and cement plant and to take positive actions to reduce them. In recent years, we have also embraced an active commitment toward the reduction of the substances requiring registration in the Pollutant Release and Transfer Register (PRTR) as well as dioxins and COD (chemical oxygen demand) levels.

1. Changes in SOx Emission Levels

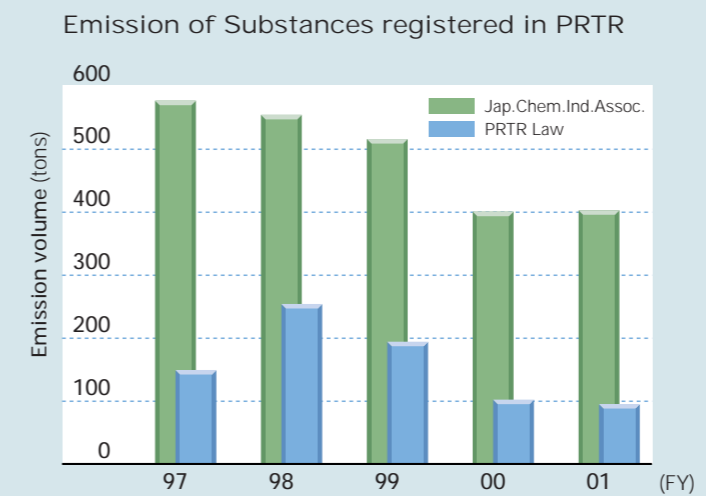
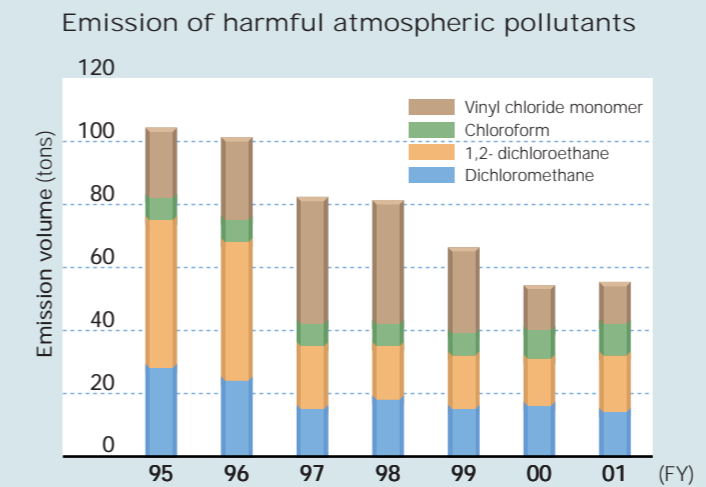
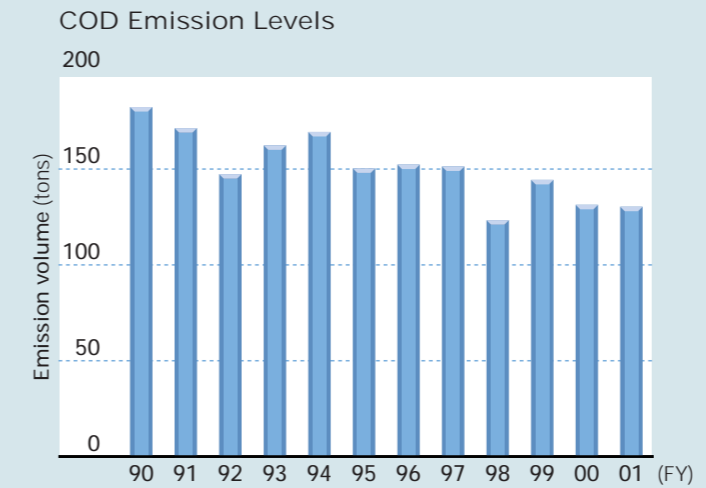
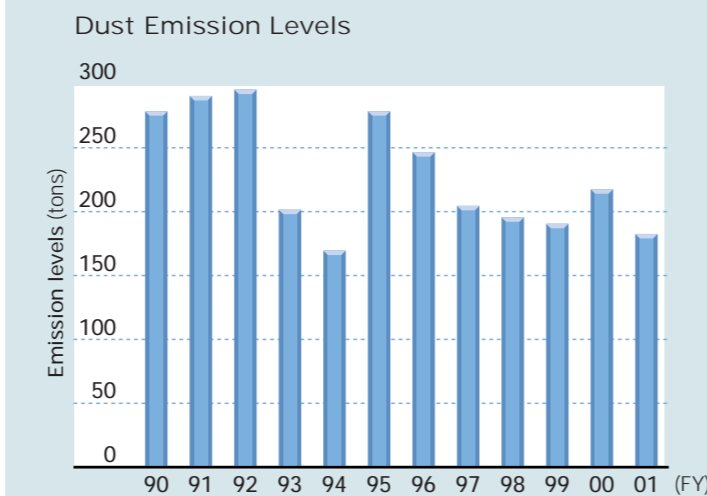
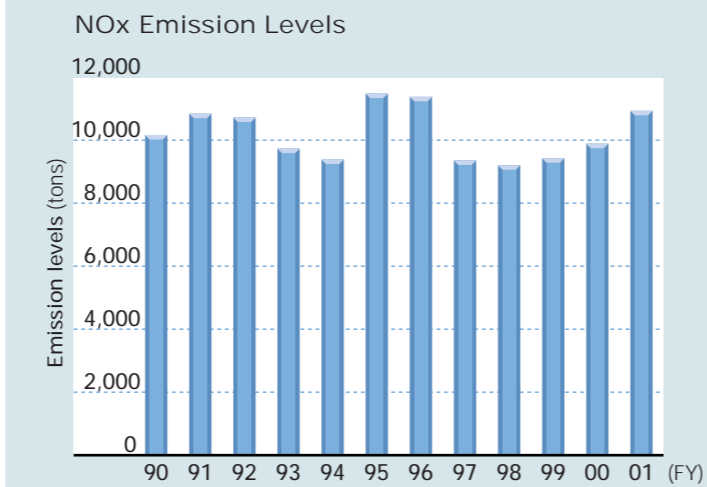
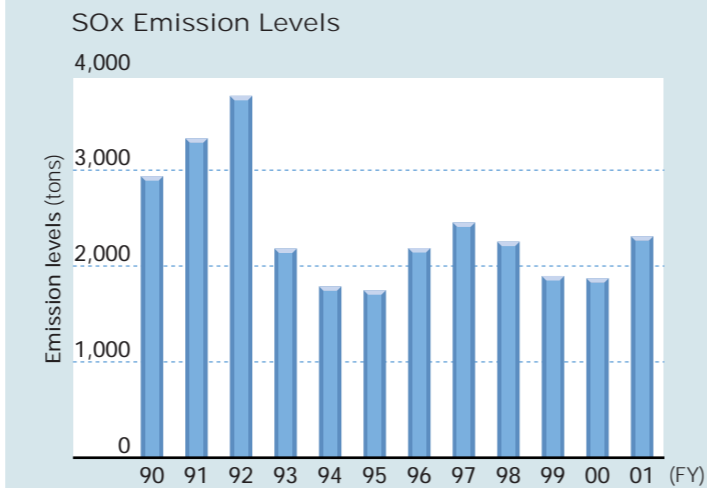
SOx* (sulfur oxides) are released from heavy oil or coal burning plant installations such as boilers, cement kilns, and dryers. All power generating boilers are provided with exhaust gas desulfurizing (de-SOx) systems in an effort to reduce their emission. The de-SOx process leads to the formation of gypsum which in turn is used as raw materials for cement.

2. Changes in NOx Emission Levels

NOx* (nitrogen oxides) are released from heavy oil or coal burning plant installations such as boilers, cement kilns, and dryers. All power generating boilers and kilns are provided with exhaust gas denitrification (de-NOx) systems in an effort to reduce their emission.

3. Changes in Dust Emission Levels

Dust is generated in the combustion of fuels in power generating boilers and cement kilns. This is why these plant units are provided with high-efficiency electrostatic dust precipitators in an effort to reduce dust emissions.



4. Changes in COD Emissions

Every effort is being made to prevent water contamination due to industrial effluents. Effluents containing organic substances are treated in activated sludge treatment facilities to reduce their chemical oxygen demand (COD)*.

5. Changes in Harmful Atmospheric Pollutant Emissions

Voluntary management activities are in place to reduce the emissions of harmful atmospheric pollutants.

We manufacture four chemicals that come under the voluntary control measures: Vinyl chloride monomer, chloroform, 1,2-dichloroethane and dichloromethane.

6. Pollutant Release and Transfer Register (PRTR)

We take part in the PRTR studies conducted by the Japan Chemical Industry Association each year in an effort to reduce pollutant emissions. In connection with the PRTR Law's coming into effect in fiscal 2001, statistical records have also been compiled on these substances.

There were 37 chemical substances on the PRTR register in fiscal 2001.

7. Dioxin Prevention Measures

We are subject to measurements and inspections under the dioxin emission control system to monitor dioxin emission from our waste incinerators and effluent treatment plants. The inspection results have demonstrated that the dioxin concentrations of the emissions from both of these facilities are within the regulation limit.

*Chemical Oxygen Demand (COD)
This is one indicator of the level of water contamination. It gives the amount of oxygen required to oxidize the organic substances in the water.

*SOx
SOx(sulfur oxides) are generated in large amounts in the combustion of fossil fuels such as coal and petroleum. They are deleterious to human health, causing mainly respiratory organ diseases. They are also responsible for acid rain.

*NOx
NOx(nitrogen oxides) are contained in the exhaust gases of automobiles and factories. They are responsible for photochemical smog and acid rain.

As part of our uncompromising commitment to safety, we collect product safety data and provide the information to our customers and distributors.

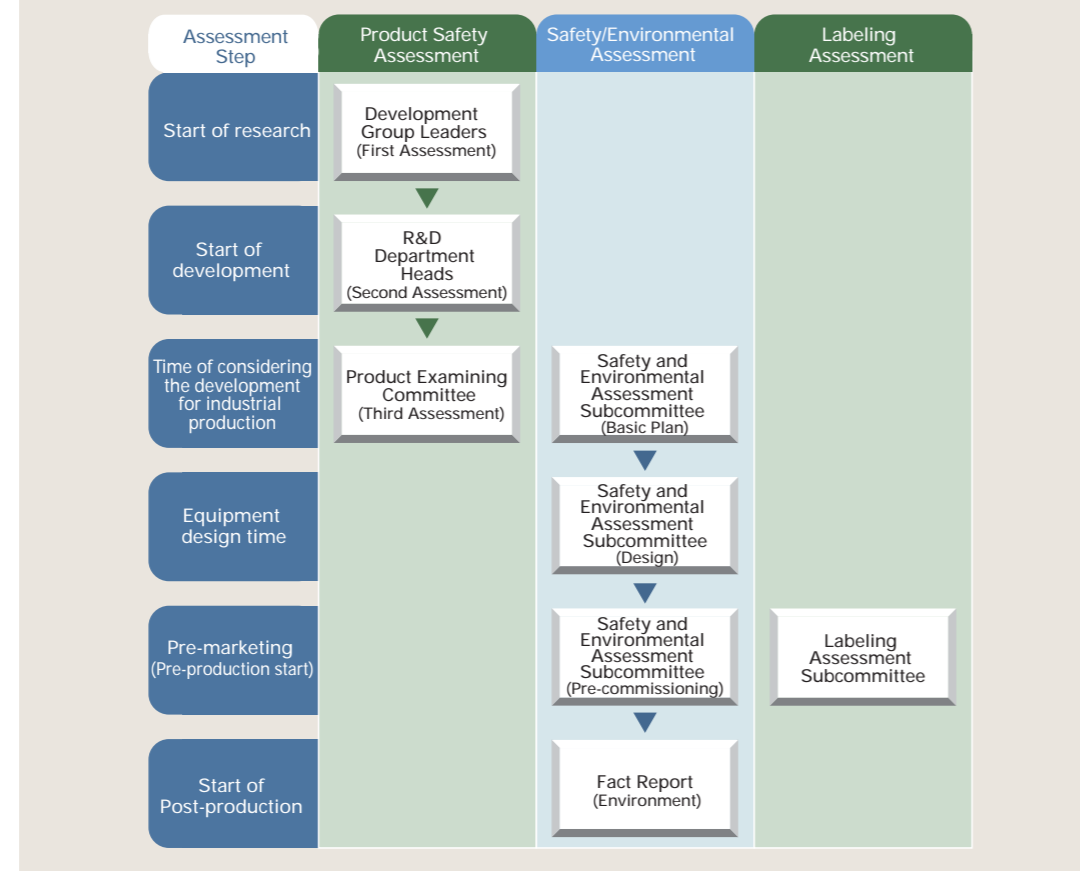
As part of our uncompromising commitment to ensuring environmental conservation and human safety and health, we are engaged in an ongoing process of collecting and compiling product safety data in the full realization that accurate information covering with the total rigors of objectivity for the entire life cycle of our chemicals is essential for ensuring health. This information furnishes the basis on which we scrutinize the safety of our equipment and work environment as well as our products and the labeling used for our products. We also conduct simulation experiments to determine the way in which chemicals disperse when emitted into the environment. This enables us to study the effect of our chemicals on the surrounding environment. For hazardous and toxic products, we give explanations and instructions to our customers and distributors on their correct use and handling.

Product and Product Labeling Assessment
At all steps in the making of our products - from their development through the design of the production facilities to the eventual marketing of the finished products - we carry out rigorous assessment from a comprehensive range of criteria to scrutinize and ensure their safety. In fiscal 2001, we carried out 13 product assessment and 185 label assessment.



Product Safety and Quality Assurance Committee

Flow of Safety Assessment Process



Dispersion Simulation for Chemicals

In order to evaluate the influence of the chemicals that are emitted from the plant on humans and the environment, simulation studies are made to assess the dispersion of chemicals released from the factory in the surrounding environment and estimate their effect, accordingly.

The simulation study data are of immense value for improving equipment and determining the voluntary control values. The simulation results are also applied to production plant and transport logistics risk assessment.



Dispersion Simulation

HPV Program

Our HPV (High Production Volume) Program is used for evaluating, in accordance with the OECD* framework, the safety of existing chemicals manufactured in large quantities (that is, manufactured in two or more countries in quantities exceeding 1000 tons a year and designated as Priority Substances by the ICCA*). We have indicated to participate in the program on 18 substances. The HVP Program is being promoted through an international consortium.

Waste Safety Management

For the rigorous management of wastes, we use waste Material Safety Data Sheets (MSDS*). They are distributed to all waste treatment operators and distributors. We also have a Yellow Card for wastes similar to those for products so that appropriate measures can be taken to ensure the safety of the wastes in a traffic accident. All drivers are required to carry this card with them when transporting wastes.

Product Stewardship — MSDS

Those who use, treat and distribute products and/or

wastes are issued with Material Safety Data Sheets (MSDS) which give explicit instructions on the correct management of the substances at all stages of the life cycle from their use to their disposal. At present, a total of 400 MSDS's have been issued for products and 65 for wastes. The MSDS forms for the 15 products that are transported in the largest quantities are presented on our home page so that they can be accessed at any time and anywhere in an emergency.

[Our Home Page]
<http://www.tokuyama.co.jp/care/index4.html>

Promoting Safety in Distribution Logistics and Environmental Management

[Instruction and Training of Members of the Distributive Trade on Safety Management]
Our distributors are given instructions and training on the properties of our products and the correct way of handling them, in accordance with our MSDS. If a traffic accident might have occurred, the Yellow Card would give full instructions about the emergency measures that should be taken to ensure a fast and proper response to the situation.

We have also created an emergency response organization and a communication system. An emergency action organization is in place to handle accidents and disasters.
[Risk Assessment in Distribution Logistics]
For the transportation of hazardous substances, risk assessments are carried out to establish an emergency system to deal with accidents and make all necessary improvements to the equipment for the prevention of accidents. This is another way in which we do our utmost to prevent accidents in the distribution of its products.

For products with a high risk of danger, training sessions are conducted in simulated accident situations.
[Energy Saving in the Distribution Process]
Maritime transport has an overwhelmingly large share of roughly three fourths in the distribution of our products. For land transport, we are taking effective measures to save energy in transit with the use of our Transit Management System.

*International Council of Chemical Associations (ICCA)
The Council promotes Responsible Care and voluntary leading action among the world's leading chemical industries and makes official pronouncements on consensus building and advise to the international administrative organizations.

*Organization for Economic Cooperation and Development
This international organization fosters 1) economic growth, 2) free trade, and 3) support to the developing countries, through a free exchange of opinions and information among the leading industrialized countries.

*Material Safety Data Sheet (MSDS)
Material Safety Data Sheets are used for entering all information relevant to the dangers and hazards of chemical products in order to their safe handling. The details include the name of the chemical, safety precautions and measures required in an emergency.

*Yellow Card
This is an Emergency Instruction Card giving details of what the driver and/or his nearest agents and what the police should do in an emergency so as to forestall accidents involving chemicals and high-pressure gases in transit.

*Product Stewardship
Product stewardship is a support system designed to reduce the impact of chemical products on humans and on the environment throughout their life cycle from their development through their distribution and sale to the disposal as wastes after use.

We are totally dedicated to the safety of our factories and personnel and to the prevention of environmental accidents.

The concern for safety lies at the bottom of all our corporate activities. Our zero-accident goal is the responsibility of all of our employees. It is an important commitment also from the viewpoint of risk management in the prevention of environmental accidents. Assuring Safety is the First Step to being a Responsible Corporate Member of the Community in which it operates. True to this commitment, we deploy a full range of activities designed to achieve our zero-accident goal.

General Accident Prevention Activities
We have a comprehensive range of fire-fighting equipment and materials in readiness for all eventualities, including chemical fire engines, high-reach water-jet fire engines, ambulance and oil fences. We have also established self-defense fire brigades in our plant complexes and implement general, joint fire drills and exercises assuming accidents that could occur.



Fire Fighting Drill at the Tokuyama Factory

Safety Activities Toward Achieving our Zero-Accident Target

Safety is the most critical factor for the continuity and stability of production activities. We have to create a workplace in which unsafe operation and unsafe conditions cannot go unnoticed. On the "look before you leap" principle, the fundamental policy for all activities enjoins all employees to heed safety first before acting. In this way we are resolute in working toward our zero-accident target.



Safety Inspection in Progress

Safety and Environmental Inspection
Safety, Environmental and Quality Inspections cover all of our plants. Any problem with our safety, environmental and quality management system discovered in the course of these inspections will be acted upon by taking the necessary improvement measures.

Acquisition of Voluntary Safety Certification

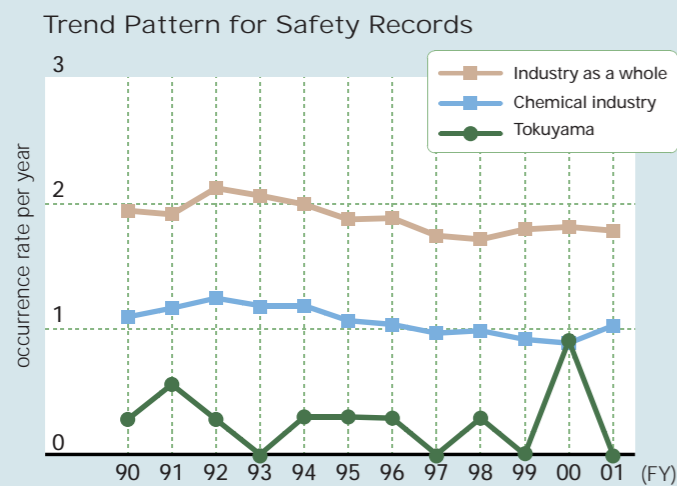
Our Factory has production facilities that are subject to the provisions of the High-pressure Gas Safety Act. We have already acquired certification for our voluntary safety inspection system covering our propylene production facilities. As the next step, we are in the process of preparing ourselves for the safety certification of our IPA production facilities. We have also passed the System Safety Management Inspection in accordance with the Electric Business Law for the in-house power generating facilities at our Factory.

Management of the Workplace Environment

In an effort to create a comfortable workplace environment, we carry out measurements to study the working environment and make improvements to the work processes and the equipment, accordingly. We also organize regular health checks and screenings to ensure the health of our employees.

Trend in Safety Activity Records

Thanks to our safety activities, we have been successful in achieving a higher level of safety than is average for both industry in general and the chemical industry in particular. In fiscal 2001, there were no accident and disaster.



Doing more to protect the local environment and to intensify exchange with the local community is our way to live together with the community as a corporate citizen.

Environmental activities require the cooperation of the communities and local government in the neighborhood of our factories. We have always made it a point of company policy to take an active part in the various activities of the local communities of which we are a corporate member. We also take part in local explanatory meetings on RC that are open to the local public and designed to enlist the understanding of the local community toward our RC activities.

Greening of the Wasteland of Disused Quarry Site at Hyuga City (Kyushu)

We used to quarry clay for cement in Hyuga City, Miyazaki Prefecture. The quarry site which is now no longer in use is close to the National Route No. 10 and the JR Nippo Line runs through it. The site is part of the stretch of hills and low mountains graced by the clear water of the Isuzu river.

Clay quarrying was discontinued in 2000 and the disused site of about 30ha that had been exploited for 24 years has been returned to its former verdure using



Greening the disused quarry site at Hyuga (Kyushu)

greening techniques to blend it in with its natural surrounds. For this purpose, new soil, including humus, was brought in to improve the soil quality and make it ready for spraying seeds.

Winning an Important Distinction:

Receiving the Award for Progress from the Head of the Ibaragi Labor Bureau At Kashima Factory, both management and labor have made great efforts to make the factory a safe workplace, and the fruits of their cooperation show: During the Nationwide Safety Week in 2001, the factory was awarded the Prize for Progress by the Head of the Ibaragi Labor Bureau. The safety drive in 2001 under the motto "Let's make the factory a pleasant workplace from which we will return home with a smile, today and everyday" saw the entire workforce engaged in activities to reach the zero-accident goal. As a result, the year ended with another accident-free record for the seventeenth year running.



Awarded the Prize for Progress

topics

Use of Incineration Ash as a Raw Material for Cement. Start up of Yamaguchi Eco-Tech New Plant.

Yamaguchi Eco-Tech Co., Ltd., a joint-venture company established by Tokuyama Corporation and Ube Industries, Ltd., was commissioned in April 2002. The plant performs the pretreatment required for the incineration ash that is discharged from the urban waste incineration facilities in the Yamaguchi Prefecture to make it suitable as a raw material for cement. Incineration ash had previously been disposed of and its effective use for cement-making will make a big difference in the way we come closer to the recycling-oriented society to come.



Participation in the Green Volunteers Event

The forest plays an important role as a “buffer dam” in protecting the natural environment and providing clean and safe water. Protecting the forest is therefore the best way of ensuring safety and a comfortable way of life for ourselves. We totally agree and support the idea of the Green Volunteers Events* sponsored by the Yamaguchi Prefecture Office of Agriculture and Forestry and have taken part in them year after year since 1997.



Green Volunteers in Action

Great Cleaning up Operation

The City of Tokuyama holds Cleaning Network Promotion events under the motto “Let’s make our city cleaner with our own hands.” We, as the “foster parent” of URAYAMA TOKUSO Route, are fully committed to the idea and do our best to clean the environment with a cleaning day (Great Cleaning Operation) once every month.



The Great Cleaning up Operation in Full Swing

Use of Eco-Cars

We use a hybrid car in the business vehicle fleet of our Environmental Safety Department. The use of low-impact car in the business vehicle fleet is a model case. We monitor on the displays in the car the extremely low-noise performance, low-energy consumption and warning displays in real-time.

Taking Part in the Kirara Exhibition

Trying to point the way toward a new symbiosis of man and nature, the Yamaguchi Kirara Exhibition was held from July through to September 2001 under the theme “Toward a Life-Blazing Future” to cast a telltale glimpse at the 21st century. Tokuyama Corporation joined with Tosoh Corporation in organizing a theme pavilion named Account of Captain Konichan’s Salt Sea Voyage. The pavilion visually presented, in an easy-to-understand and entertaining manner, the benefits of chemistry that open up our future through its “life” rearing and life-supporting (salt) capabilities, and the many and various functions of salt.



The Yamaguchi Kirara Exhibition

Taking Part in the Dai-Tokuyama Summer Festival

The Dai-Tokuyama Summer Festival attracts the participation of large crowds and many companies each year. We have also been on hand with about a hundred of our employees joining the festivities and taking part in the “Shrine Bearing Procession” where we excelled once again: Our brilliant brawny performance at the Shrine Carrying Contest was rewarded with the Tokuyama City Mayor’s Award for the second consecutive years. We also took part in the Cutter Contest at the Nonta Festival in the autumn of 2001. (We came third in the 2001 results.)



Dai-Tokuyama Festival

We are making progress in our unwavering commitment to achieving the recycling-oriented society to come.

Historical Overview of our RC Activities

7/1991	Global Environmental Issues Committee established
3/1993	RC Administration Committee established —Voluntary plan for overall management of environment, safety and quality established.
4/1994	ISO9002 certification acquired for high-purity isopropyl alcohol
6/	Arrangement for quality assurance system, including product safety and labeling assessment
12/	Internal Export Control Committee established
4/1995	Participation in Japan RC Council
2/1997	First edition of RC Report issued
5/	ISO9001 certification acquired for cement
4/1998	ISO9001 certification acquired for dental materials
12/	ISO9001 and ISO9002 certification acquired for aluminum nitride, precipitated silica, etc. —Tokuyama Factory acquired ISO14001 certification.
1/1999	Kashima Factory acquired ISO14001 certification.
6/	ISO9002 certification acquired for inorganic chemicals, polypropylene, film, etc.
12/	Ecological Management Initiative Dept. inaugurated. ISO9002 certification acquired for polycrystalline silicon, organic solvents, etc.
8/2000	Recycling and Environmental Business Dept. inaugurated
4/2001	Yamaguchi Eco-Tech. Co., Ltd. established

Promoting of RC Activities to Companies throughout the Tokuyama Group Our efforts are focused on the wider penetration of our RC activities to all member companies of the Tokuyama Group. Starting in 2000, we have implemented safety and environmental inspections at a few companies at a time in an effort to reinforce and upgrade the safety and environmental management systems of our Group members both in Japan and abroad. A growing number of Group companies, including overseas ones, have been successful in acquiring ISO14001 and ISO9000s certifications. It is also in progress to sum up the results of our Group members’ RC activities for evaluation.

Company Profile

Established: February 16, 1918
Headquarters: Shibuya Konno Bldg., 3-1 Shibuya 3-chome, Shibuya-ku, Tokyo 150-8383, Japan
Business locations: Tokuyama Factory, Kashima Factory, Tsukuba Research Laboratory
Capital(as of March 31, 2002): JPY19.273 billion
Sales (FY2001): JPY154.072 billion
Employees: 2,276
Area of Business/Main Products: Soda ash, inorganic and organic chemicals, cement, civil engineering and construction materials, synthetic resins, ion exchange membrane and other highly polymerized compounds, fine ceramics, pharmaceutical and agrochemical intermediates, electronic instruments and parts and materials for them.

Our homepage has a Questionnaire Web. We look forward to your comments.
<http://www.tokuyama.co.jp/care/enquette.html>



For all inquiries, please to contact us at:

Tokuyama Corp.

Responsible Care & Eco-Management Dept.

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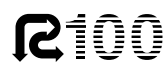
URL : <http://www.tokuyama.co.jp/>

e-mail : rc-toukatsu@tokuyama.co.jp



Responsible Care (RC) is a self-management activity to implement and improve measures concerning health and safety and the environment.

It is an activity of a corporation producing or handling chemical substance that pledges in its management policy to protect the "environment" and to ensure health and safety throughout the entire chemical substance life cycle, from development, manufacturing, distribution, use, and final consumption, to disposal based on the principle of self-determination and self-responsibility.



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