

CSR Report and Corporate Profile 2013 Data Section

Contents

P 2 Promoting Environmental Management

- 2 Tokuyama's Environmental Management
- 3 Environmental Accounting
- 4 Commitment to the Prevention of Global Warming
- 5 Reduction of Air and Water Pollutants
- 7 Reducing Waste and Promoting Recycling

P 8 With Communities

- 8 Communicating with Communities
- 9 Process Safety, Disaster Prevention and Occupational Health and Safety

P 10 Site Report

- 10 Tokuyama Factory
- 11 Kashima Factory
- 12 Activities of Group Companies

P 14 Data Sheet

- 14 Tokuyama's Environmental Data
- 14 SOx, NOx and Soot Emissions
- 14 Nitrogen and Phosphorus Emissions
- 14 Waste Management
- 15 Unit Energy Consumption Index (Tokuyama Factory)
- 15 Unit Consumption of Waste and By-Products in Cement
- 15 Material and Thermal Recycling Volumes in Cement Production
- 15 Energy Consumption
- 15 CO₂ Emissions
- 16 PRTR Substance Emissions
- 16 Hazardous Air Pollutant Emissions
- 16 Industrial Effluent and COD Level
- 16 Breakdown of Industrial Waste by Treatment
- 16 Landfill Volume and Effective Utilization Rate, etc.

User Guide

This PDF is designed to be easy to use and search for information.

Click to go to the top page of each category.

Promoting Environmental Management

With Communities

Site Report

Data Sheet

- Tokuyama's Environmental Management
- Environmental Accounting
- Commitment to the Prevention of Global Warming
- Reduction of Air and Water Pollutants
- Reducing Waste and Promoting Recycling

Page number



Icon guide



Go to Contents



Search



Print



Return to the last page opened



Go back to the previous page



Go forward to the next page

- Tokuyama's Environmental Management
- Environmental Accounting
- Commitment to the Prevention of Global Warming
- Reduction of Air and Water Pollutants
- Reducing Waste and Promoting Recycling

Promoting Environmental Management



Tokuyama's Environmental Management:

Performance for Fiscal 2012

Protecting the Global Environment

One of our most important corporate social responsibilities is to actively protect the global environment. Tokuyama practices environmental management with an emphasis on environmental perspectives in all of its business activities.

Performance for Fiscal 2012

Flow of Materials in Business Activities

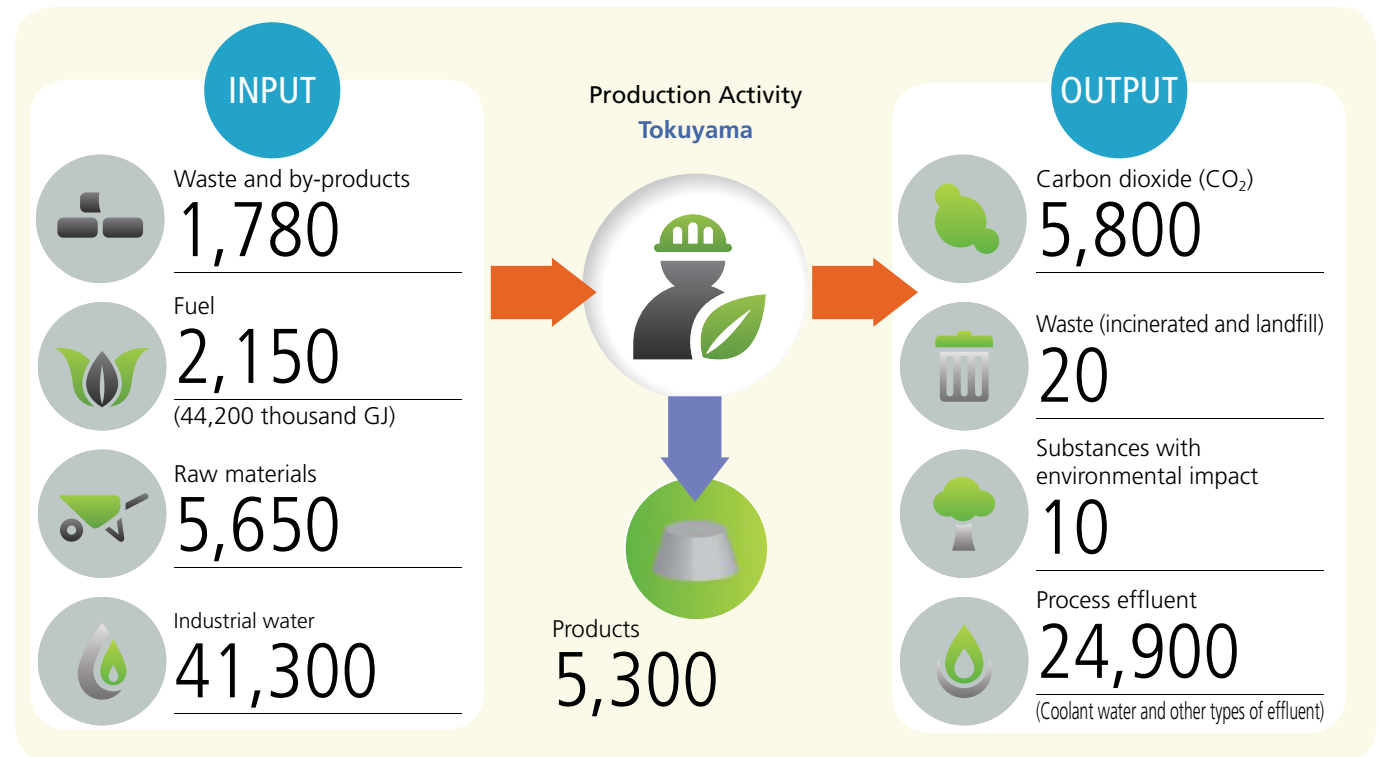
Tokuyama strives to obtain accurate data on the input and output of materials and substances in its business activities and reduce the environmental impact of these activities to meet its environmental targets.

Results of Environmental Preservation Activities

Among its fiscal 2012 targets for environment impact reduction, the Company failed to achieve its soot and dust-emission reduction target due to the increased utilization of facilities subject to environmental regulations. We also failed to meet targets for the reduction of PRTR substance emissions and unit energy consumption index because of a decline in the Tokuyama Factory's overall facility utilization rate. On the other hand, we achieved our waste reduction target by pursuing proactive recycling efforts internally and externally.

Flow of Materials in Business Activities

(Unit: 1,000 metric tons)



- Tokuyama's Environmental Management
- Environmental Accounting
- Commitment to the Prevention of Global Warming
- Reduction of Air and Water Pollutants
- Reducing Waste and Promoting Recycling

Fiscal 2012 Results of Environmental Preservation Activities (Tokuyama Factory)

Rating: ○: Satisfied; ×: Not satisfied

Category	Items	Fiscal 2012 Target	Fiscal 2012 Result	Rating	Fiscal 2013 Target	
Environmental Impact Reduction	Atmosphere	Soot and Dust (Compared to the average emission from fiscal 2008 to 2010)	±0%	+27%	×	Emissions target reset to 200 metric tons per year, about 30% higher than the fiscal 2012 target, to reflect the expected facility utilization rate and individual facility characteristics
	Water Quality	COD (Compared to the fiscal 2010)	±0%	-5%	○	±0%
		Nitrogen (Compared to the fiscal 2010)	±0%	-15%	○	±0%
		Phosphorus (Compared to the average emission from fiscal 2008 to 2010)	±0%	-9%	○	±0%
	PRTR	PRTR (Compared to the average emission from fiscal 2008 to 2010)	±0%	+14%	×	-14%
Energy Conservation	Unit Energy Consumption Index (Compared to the fiscal 1990)	24% lower than the fiscal 1990 level	22% lower than the fiscal 1990 level	×	24% lower than the fiscal 1990 level	
Global Environment Conservation	Recycling	Rate of Effective Waste Utilization	Maintain at 94%	94.8%	○	Maintain at 94%
Waste Reduction	Zero Emission	Zero-Emission Rate	Maintain at 99.9%	99.9%	○	Maintain at 99.9%

In fiscal 2012, Tokuyama met its targets for water pollutant reductions (COD, nitrogen and phosphorus), recycling and zero emissions.

Environmental Accounting

To accurately grasp and analyze the amounts of investments and costs associated with environmental preservation activities and improve the effectiveness of environmental investment, Tokuyama has implemented environmental accounting since fiscal 2000.

Environmental Costs

Of Tokuyama's total environmental investment during fiscal 2012, investments related to pollution control, resource recycling and global environmental conservation accounted for 71%, 19% and 7%, respectively. At the same time, investments related to management activities accounted for 2%. Costs related to pollution control, resource recycling and global environmental conservation accounted for 69%, 14% and 10%, respectively, of the Company's total environmental costs for the same period.

Environmental Preservation Costs

Category	Major Activities	Amount Invested (¥ million)	Costs (¥ million)	
Costs in the Business Areas	Pollution Control	Replacement of electric dust collectors and neutralizing facilities, etc.	861	4,776
	Global Environmental Conservation	Improvement of facilities for the effective utilization of coal	88	680
	Resource Recycling	Efficient use of resources	235	990
Upstream and Downstream Costs			0	2
Management Activity Costs		Environmental analysis equipment, etc.	20	271
Research and Development Costs			0	0
Social Activity Costs		Greenery development, production of CSR report	1	68
Costs for Environmental Damage		Imposition, management of a former mining site	0	158
Total			1,206	6,945

Major environmental investments in fiscal 2012 included the replacement and reinforcement of neutralizing facilities; the construction of storage facilities for polluted soil accepted from outside corporations, which accompanied the installation of strengthened soil contamination countermeasures; and other steps to promote waste treatment.

Economic Benefits

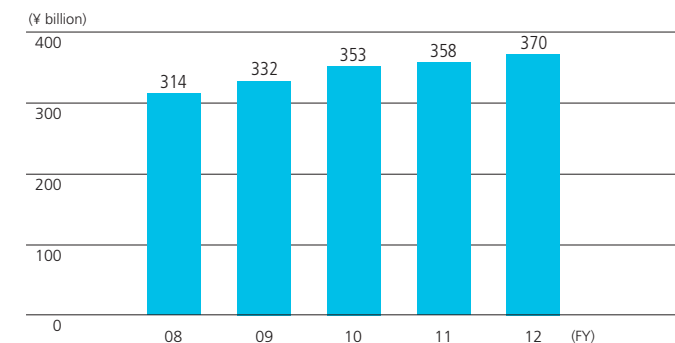
To analyze the economic benefits, we calculate nothing but the real benefits of gains on reduction in energy consumption, gains on sale of valuable waste, gains on reduction in waste disposal costs through waste recycling, and gains on reduction in raw material and fuel costs through waste recycling.

In fiscal 2012, Tokuyama achieved economic benefits totaling approximately ¥1.7 billion, up about ¥30 million from fiscal 2011.

Economic Benefits in Fiscal 2012

Category	Material Benefit (1,000 metric tons)	Economic Benefit (¥ million)
Gains on Reduction in Energy Consumption		177
Gains on Sale of Valuable Waste	72	298
Gains on Reduction in Waste Disposal Costs through Waste Recycling	283	727
Gains on Reduction in Raw Material and Fuel Costs through Waste Recycling	284	512
Total		1,714

Cumulative Total Environmental Investments (since fiscal 1990)



- Tokuyama's Environmental Management
- Environmental Accounting
- Commitment to the Prevention of Global Warming
- Reduction of Air and Water Pollutants
- Reducing Waste and Promoting Recycling

Commitment to the Prevention of Global Warming

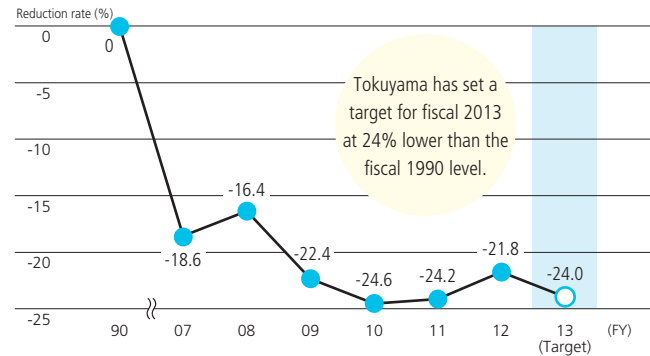
Prevention of global warming is key to the future of the human race. Tokuyama is making steady energy conservation achievements in its business activities while supporting energy conservation in employee households.

Promotion of Energy Conservation

Tokuyama consumes a huge amount of energy in manufacturing its core products, such as caustic soda, cement and polycrystalline silicon. Carbon dioxide, one of the greenhouse gases, is generated chiefly by burning fossil fuels and also by the decarboxylation of limestone used as a raw material in cement production.

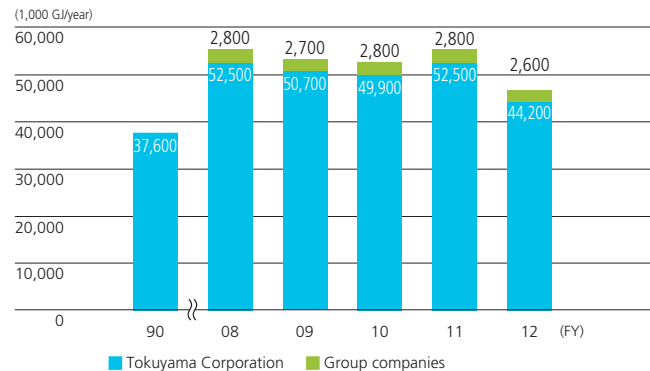
Aware of the high priority of preventing global warming, the Company is conducting energy conservation activities to reduce carbon dioxide emissions. The Tokuyama Factory is responsible for more than 99% of the Company's energy consumption. Taking this fact into consideration, in fiscal 2012 the Tokuyama Factory undertook the switchover from coal to alternative fuels as well as the acceleration of energy-saving activities. However, the unit energy consumption index of the Tokuyama Factory has been reduced no more than 22% (with unit energy consumption in fiscal 1990 set as 0) due to a decrease in the factory's overall facility utilization rate.

Unit Energy Consumption Index* (Tokuyama Factory)

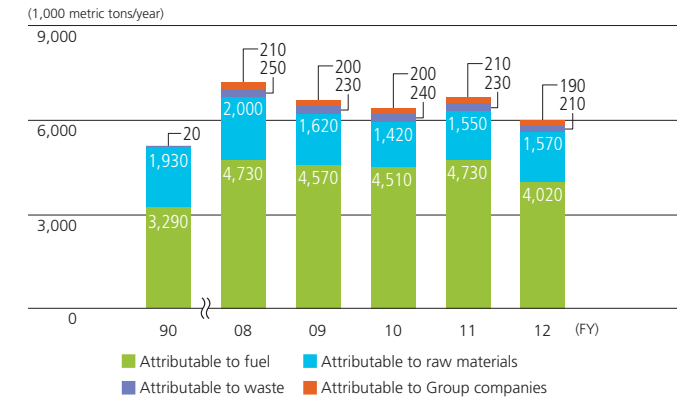


* The unit energy consumption index is calculated using a method recommended by the Japan Chemical Industry Association (JCIA).

Energy Consumption



CO₂ Emissions



Efforts at Our Offices

In fiscal 2012, the Tokyo Head Office implemented the Cool Biz campaign earlier in the year than usual, as we did in fiscal 2011. At the same time, we carefully controlled the air-conditioner temperature settings while removing some lighting at the offices and changing the settings of all the PCs to energy saving mode.

Contributing to Global Warming Prevention Efforts in the Consumer Sector

Through the provision of Shanon®—a plastic window sash that supports energy conservation in residential houses, the Tokuyama Group has been helping to reduce CO₂ emissions. We focus our efforts on the development of technologies that contribute to the prevention of global warming through such initiatives as the development of a new production method for polycrystalline silicon for solar cells, the development of electrolyte membranes for fuel cells and so forth.

- Tokuyama's Environmental Management
- Environmental Accounting
- Commitment to the Prevention of Global Warming
- Reduction of Air and Water Pollutants
- Reducing Waste and Promoting Recycling

Global Warming Prevention Support Program

In April 2008, Tokuyama set up this program to encourage Tokuyama Group employees to take action aimed at helping prevent global warming, as part of its environmental, energy-saving and social contribution activities from the standpoint of CSR promotion. Through the program, the Company covers part of the costs incurred by employees purchasing and installing specific eco-friendly products closely related to the Group's business, namely the plastic window sash for residential use and the solar power generation system. Its objective is to help reduce CO₂ emissions in the household sector by raising Group employees' awareness of global warming and encouraging them to save energy.

The table below shows the status of use of the program by Group employees in the past five years.

Status of Use of the Global Warming Prevention Support Program

	Plastic Window Sashes		Solar Power Generation Systems	
	Number of Cases of Subsidization	(Units)	Number of Cases of Subsidization	(kW)
Fiscal 2008	12	177	6	24.01
Fiscal 2009	7	141	8	33.35
Fiscal 2010	7	91	30	129.41
Fiscal 2011	13	174	22	87.04
Fiscal 2012	6	61	23	108.27
Total	45	644	89	382.08

The program has been continued in fiscal 2012 despite the increasingly harsh operating environment surrounding the Tokuyama Group. Over the past five years, subsidies for the installation of plastic window sashes have been relatively stable while cases of subsidization for solar power generation systems have demonstrated increasing trend. We assume this reflects the rising awareness, even for private households, of the need for global warming prevention. We post data and status updates on the utilization of the program on the Group's intranet site, which also introduces external websites providing additional information on global warming prevention for the enlightenment of employees.

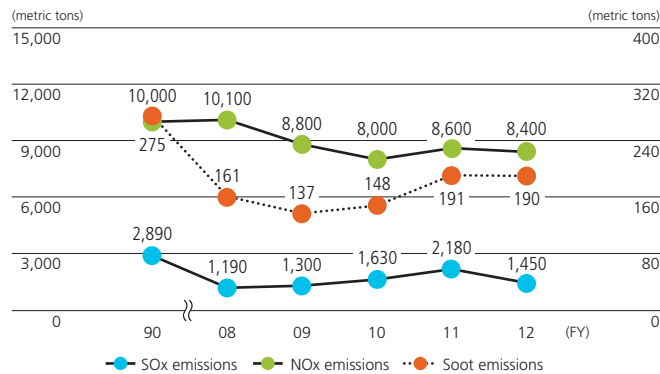


Air Pollutant Emissions

We have equipped our boilers, cement kilns and other sources of air pollutants with such emission control systems as flue gas desulfurizers, denitration equipment, low NOx burners and high-performance dust collectors in an attempt to reduce sulfur oxides (SOx), nitrogen oxides (NOx) and soot emissions.

In fiscal 2012, soot emissions increased year on year in line with the increased utilization of the aforementioned facilities.

SOx, NOx and Soot Emissions

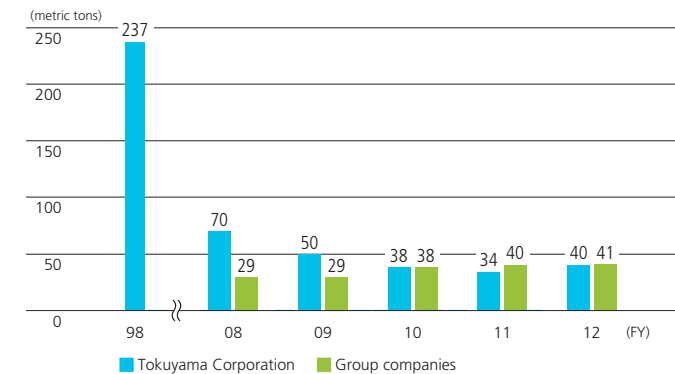


PRTR* Substance Emissions

Twenty-nine substances among those handled by Tokuyama in fiscal 2012 are subject to notification under the Pollutant Release and Transfer Register (PRTR) legislation. In fiscal 2012, the Company continued to promote Companywide efforts to reduce the emission of PRTR substances. However, Tokuyama Corporation's total PRTR substance emissions (non-consolidated basis) increased by about 6 metric tons year on year to 40 metric tons, reflecting an increase in operational disruptions due to the malfunctions of facilities that handle these substances.

* The pollutant release and transfer register (PRTR) refers to a system of collecting and publishing data on the sources of hazardous substances, the amounts of such substances emitted into the environment or carried away from business sites in the form in which they are contained in waste.

PRTR Substance Emissions

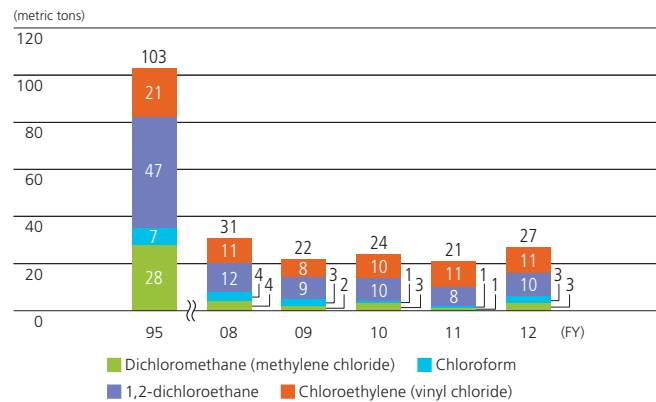


- Tokuyama's Environmental Management
- Environmental Accounting
- Commitment to the Prevention of Global Warming
- Reduction of Air and Water Pollutants
- Reducing Waste and Promoting Recycling

Hazardous Air Pollutant Emissions

Tokuyama sets out a voluntary reduction plan for four substances that it produces, including chloroethylene, among the 12 substances subject to voluntary control in accordance with the Air Pollution Control Law. In accordance with the plan, the Company consistently implements measures to reduce the emission of these substances.

Hazardous Air Pollutant Emissions



Countermeasures against Dioxin

Waste oil incinerators and parts of vinyl chloride monomer manufacturing facilities are subject to regulations under the Special Measures Law for Countermeasures against Dioxins. Tokuyama measures dioxin concentrations in flue gas and wastewater, and the figures remain far below the control levels.

Industrial Effluent and Water Pollutant Emissions

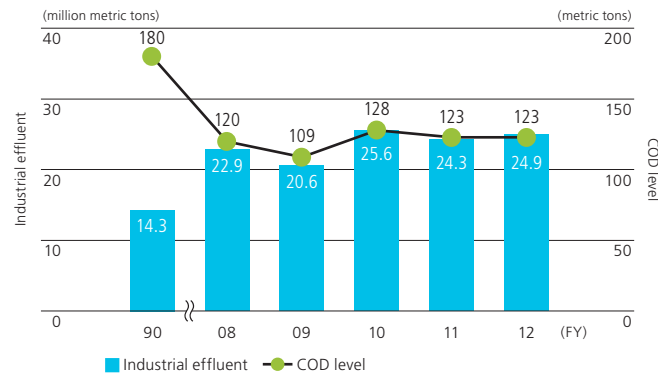
To meet the statutory limits as well as limits agreed on with local governments, the Tokuyama Factory has set tighter voluntary limits to carry out stringent control through pollutant monitoring and purification using wastewater treatment equipment.

The levels of chemical oxygen demand (COD),* nitrogen and phosphorus are subject to regulation in terms of total emissions in relation to water quality. To ensure compliance with indicators for these three items, Tokuyama is working to reduce the levels of their emissions through the use of activated sludge treatment facilities and other equipment.

In fiscal 2012, nitrogen and phosphorus emissions decreased slightly year on year while the COD level remained virtually flat compared with the previous year.

* An indicator used to measure water quality and refers to the amount of oxygen required to oxidize organic compounds in water.

Industrial Effluent and COD Level



Nitrogen and Phosphorus Emissions

(metric tons)

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Nitrogen	108	140	110	108	94
Phosphorus	2.9	3.6	2.3	2.8	2.7

- Tokuyama's Environmental Management
- Environmental Accounting
- Commitment to the Prevention of Global Warming
- Reduction of Air and Water Pollutants
- Reducing Waste and Promoting Recycling

Reducing Waste and Promoting Recycling

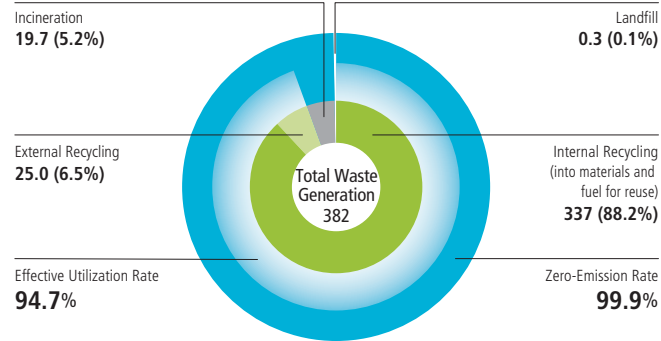
As a result of its exhaustive efforts to reduce and recycle waste, Tokuyama maintained the effective waste utilization rate at 94% and the zero-emission rate at 99.9% in fiscal 2012.

Waste Management

In fiscal 2012, Tokuyama generated 382 thousand metric tons of waste. The Company actively recycled this waste internally and externally, mainly reusing it as raw materials and fuel for cement production at the Tokuyama Factory. Packing materials, pallets and other wood waste were crushed into woodchips so that they could be effectively used as fuel at power plants. As we worked diligently to recycle waste into raw materials for cement, we kept on target, maintaining an effective waste utilization rate of 94%. We stepped up our activities for reusing and reducing waste and, accordingly, maintained our high landfill zero-emission rate at 99.9%.

Breakdown of Industrial Waste by Treatment for Fiscal 2012

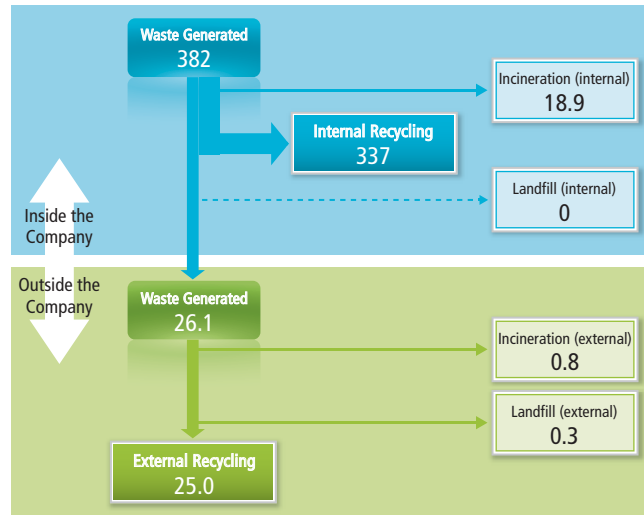
(Unit: 1,000 metric tons)



$$\text{Effective Utilization Rate (\%)} = \frac{\text{Recycling Volume (internal and external)}}{\text{Total Waste Generation}} \times 100$$

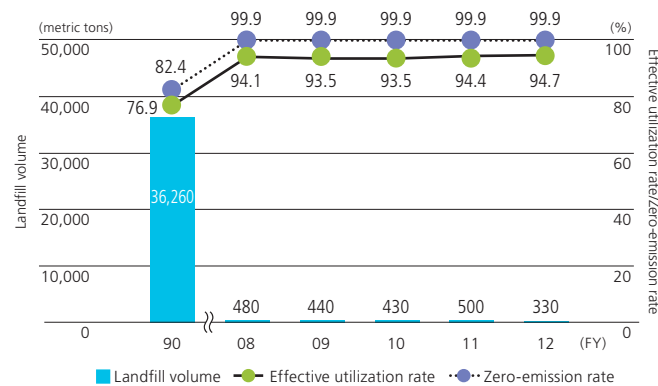
$$\text{Zero-Emission Rate (\%)} = \left[1 - \frac{\text{Landfill Volume (internal and external)}}{\text{Total Waste Generation}} \right] \times 100$$

Flow of Industrial Waste Treatment



* Figures are for fiscal 2012 and in the unit of 1,000 metric tons.

Landfill Volume, Zero-Emission Rate and Effective Utilization Rate



Management and Treatment of PCB Waste

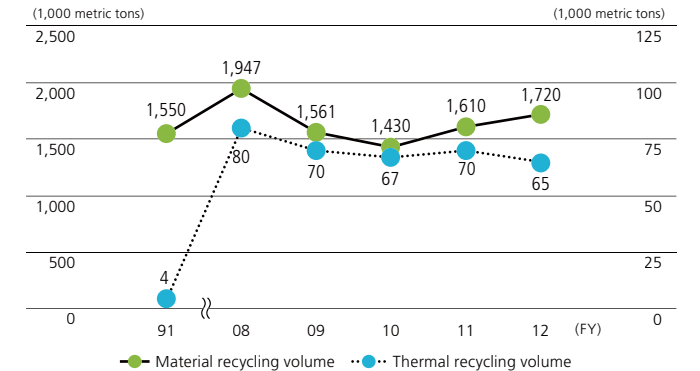
The Tokuyama Group has 78 transformers and capacitors containing polychlorinated biphenyl (PCB).* The Group has already stopped using them. In compliance with the Special Measures Law for the Proper Treatment of Polychlorinated Biphenyl Waste, they are retained and managed in an appropriate manner. In accordance with the plan of the Japanese government, wide-area PCB treatment facilities are being constructed at various locations in Japan, and some of these facilities have started operation.

Taking advantage of the early registration program, the Tokuyama Group finished its registration to the Japan Environmental Safety Corporation (JESCO) in December 2005 and commenced disposal in fiscal 2009. In June 2013, the Tokuyama Factory began to transfer PCB waste that it has retained to the abovementioned treatment facility, starting full-scale disposal of such waste.

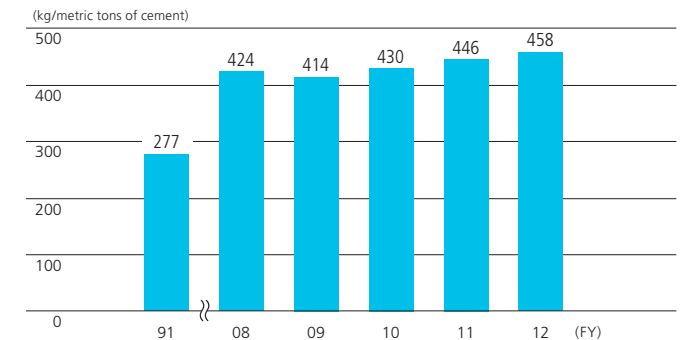
* PCB is an organic chlorinated compound that emits dioxins when burned at a low temperature. Chemically stable and excelling in thermal resistance, chemical resistance, insulation and other electric characteristics, it was formerly used in many different electric products, including transformers and capacitors. However, it has been banned from production or utilization since 1972 because of its hazardousness to humans. Transformers, capacitors and other PCB-containing products that have already been distributed have to be retained at business establishments.

Recycling in the Nanyo Plant's Cement Production

Material and Thermal Recycling Volumes



Unit Consumption of Waste and By-Products



- Communicating with Communities
- Process Safety, Disaster Prevention and Occupational Health and Safety

Communicating with Communities

Tokuyama's manufacturing operations originated in Shunan City (the former Tokuyama City). Proud of being one of the largest plants in Shunan, we are providing society with high-quality, highly efficient products while paying the utmost attention to safety. With the goal of creating a factory that interacts proactively with local communities, we have been promoting communication with local people through such initiatives as inviting them on factory tours, aiming to gain the confidence of local society.

Tokuyama Factory RC Community Dialogues

On August 29, 2012, the fiscal 2012 RC Community Dialogue took place at the main conference room of the Tokuyama Factory. With the objective of gaining the understanding of community associations around the Tokuyama Factory with regard to the Company's safety and disaster prevention efforts and environmental conservation initiatives, this event was the ninth of its kind.

The event drew 27 participants from community associations and one from the Shunan City Government. Mr. Hashimoto, assistant manager of the Environmental Policy Division of the Shunan City Government, delivered a presentation on the environment of Shunan City. The Company gave a presentation centered on its process safety and disaster prevention initiatives to dispel anxiety about factory fires and disasters, subjects of growing concern among some community association members. Also, four general managers representing each of the manufacturing departments strongly expressed their determination to protect the environment and maintain safety.

Looking ahead, we will diligently pursue process safety and disaster prevention activities to achieve zero-accident and zero-disaster status, with all factory staff working as one.



The Tokuyama Factory RC Community Dialogue

Forest Volunteer Activities: The Meeting for Exchange among the City, the Forest and the Water

On November 3, 2012, the 16th Meeting for Exchange among the City, the Forest and the Water, a project for creating a forest for water conservation, took place under the auspices of the Yamaguchi Prefectural Shunan Agriculture and Forestry Office at the municipal Fureai-no-Mori forest in Susuma, Shunan City.

Aimed at securing a stable supply of high-quality water by creating a forest serving as a green dam, which is among the multiple functions of forests, this volunteer program included the removal of weeds that impede the growth of trees as well as the pruning, thinning and planting of broad leaf trees. The Tokuyama Group has been proactively participating in this program since 1997.

At the meeting, some 186 Tokuyama employees took part in the forest development under the guidance of forestry instructors.



Forest volunteer activities, the Meeting for Exchange among the City, the Forest and the Water

- Communicating with Communities
- Process Safety, Disaster Prevention and Occupational Health and Safety

Process Safety, Disaster Prevention and Occupational Health and Safety

Tokuyama believes that safety is an essential part of business activities and that ensuring safety is the first step in achieving coexistence with society. In taking this stance on safety, Tokuyama thoroughly conducts process safety and disaster prevention activities as well as occupational health and safety efforts. By doing so, the Company endeavors to prevent accidents and disasters while striving to provide a favorable working environment.

Commitment to Safety and Disaster Prevention

All-Inclusive Safety and Disaster Prevention Activities

Tokuyama has three safety principles. According to these principles, safety is, in the first instance, a social responsibility to be met as a corporate citizen. Second, safety is given priority over all other business activities; and third, security can be achieved by the fact that all staff members have a responsible attitude and engage in responsible activities.

In line with these principles, we make painstaking efforts to ensure the safety of facilities and processes. Specifically, we continually strive to improve our level of security control, identify the sources of hazards and enrich our security education and training. Accordingly, we promote such efforts as safety patrol operations, Kiken Yochi (KY) hazard prediction activities, Hiyari Hatto accident prevention activities, the five-S activities,* as well as the practice of pointing and calling a name out loud. In addition to these basic activities, we operate and continuously improve risk management and crisis management systems.

* Five-S activities: An initiative to ensure the five-S features at the workplace. The five-S's refer to Seiri (tidy), Seiton (organized), Seiketsu (clean), Seiso (cleaning) and Shitsuke (disciplined).

Disaster Drills

Tokuyama conducts a variety of disaster drills, including general disaster drills in tandem with the Shunan City Government.

Efforts to Maintain Safety Performance and Stay Accident-Free

The Tokuyama Factory maintained its zero-disaster record in fiscal 2012 for the fifth consecutive year. The Kashima Factory and the Tsukuba Research Laboratory also saw no disasters in fiscal 2012. Moreover, we recorded



The New Year's Fire Review (January 18, 2013)

no on-the-job accidents affecting Tokuyama employees. However, the Tokuyama Factory experienced four accidents involving contractors' employees. One of these accidents forced a worker to take a leave of absence, while the other three required no time off to be taken. Looking ahead, we will continue our efforts to achieve zero-accident and zero-disaster status.

Commitment to Occupational Health and Safety Strengthening the Safety Management System

With the aim of completely removing potential risk factors, each factory and laboratory adopted Safety Management Systems and is continuously improving these systems through risk assessments of work practices, facilities and processes. Also, discussions are now under way to formulate improved systems for the measurement of the effects brought by changes in safety management methods.

Helping Contractors Promote Safety and Health Activities

By holding active dialogues on safety, Tokuyama and its contractors share their wisdom and eliminate potential risks associated with work in the field, thereby collaboratively promoting safety management activities. In these ways, Tokuyama is striving to safeguard all personnel working at its plants from accidents and disasters.

Promoting Mental and Physical Health

We implement such steps as taking measurements at worksites where specified chemical substances and organic solvents are handled. Our industrial doctor inspects these worksites and we take other steps to improve facilities and working methods.

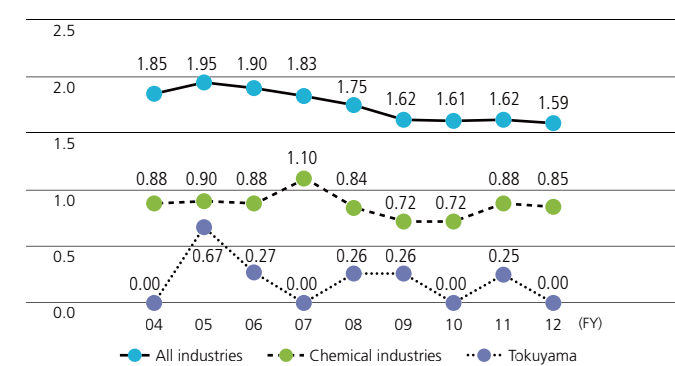
To combat lifestyle related diseases, we provided health guidance through face-to-face counseling based on the results of health checkups and issued written notifications to encourage those who failed to undergo a recommended complete checkup to do so. Consequently, the ratio of those who underwent such recommended checkups significantly improved to 85.5% from 69.3% in the previous fiscal year. Although Tokuyama has seen an upward trend in employee absenteeism in recent years, the rate for fiscal 2012 decreased from 5.8‰ to 5.5‰ on a Companywide basis.

We are also working to strengthen our structure for assisting in the health management of expatriates through such steps as dispatching an industrial doctor to our locations overseas (Malaysia and Shanghai).



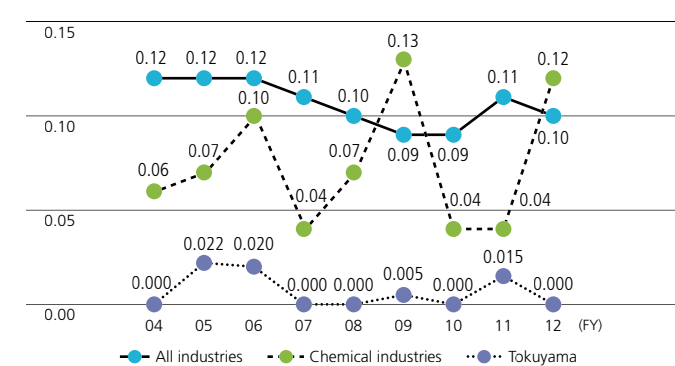
Safety Audit (Kashima Factory)

Trend in the Accident Frequency Rate*1



*1 The accident frequency rate refers to the number of workers forced into absence through industrial accidents per one million cumulative working hours. This reflects the frequency at which industrial accidents occur.

Trend in the Accident Severity Rate*2



*2 The accident severity rate refers to the number of lost work days per one thousand cumulative working hours. This reflects the magnitude of industrial accidents that have taken place.

Fiscal 2012 Investment in Process Safety, Disaster Prevention and Occupational Health and Safety Countermeasures	Amount (millions of yen)	Ratio (%)
Countermeasures against explosions, fire and leakage	386	60
Countermeasures to improve occupational safety and work environment	236	37
Countermeasures against earthquakes and other natural disasters	17	3
Total	639	100



Hideki Adachi
General Manager of the
Tokuyama Factory

Tokuyama Factory

Location: 1-1, Mikage-cho, Shunan-shi, Yamaguchi Prefecture, Japan

Employees: 1,650

Factory Area: 1,910,000 square meters (total area)

Main Products: Cement, inorganic and organic chemical products, polycrystalline silicon, fumed silica, vinyl chloride monomer and others

Performance Data

	Unit	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
SOx Emissions	Metric tons	1,190	1,300	1,630	2,180	1,450
NOx Emissions	Metric tons	10,100	8,800	8,000	8,600	8,400
Soot Emissions	Metric tons	161	137	148	191	190
Industrial Water Consumption	Million metric tons	40.6	41.8	40.5	43.8	41.3
Effluent	Million metric tons	22.8	20.5	25.5	24.2	24.8
COD Level	Metric tons	116	107	124	119	119
Total Nitrogen Emissions	Metric tons	108	140	110	108	94
Total Phosphorus Emissions	Metric tons	2.9	3.6	2.3	2.8	2.7
PRTR Substance Emissions	Metric tons	66	48	37	32	39
Waste Generated	Thousand metric tons	344	300	312	379	381
Final Waste Disposal Volume	Metric tons	460	420	417	490	320
Energy Consumption*	Thousand GJ	52,400	50,600	49,800	52,400	44,100
CO ₂ Emissions (attributable to fossil fuel)*	Thousand metric tons	4,730	4,570	4,500	4,730	4,020
Complaints	Complaints	0	1	5	3	0

* The calorific power and other figures have been recalculated retrospectively to 1990, following the amendment of the Act on the Rational Use of Energy.

Emissions and Transfer of PRTR Substances in Fiscal 2012

Unit: metric tons (mg-TEQ for dioxins)

Substance	Government Ordinance Number	Emissions				Amount Transferred
		To Air	To Water	To Soil	Subtotal	
Chloroethylene (vinyl chloride)	94	10.5	0.0	0.0	10.5	0.0
1,2-Dichloroethane	157	10.3	0.0	0.0	10.3	0.3
Chloromethane (methyl chloride)	128	5.4	0.0	0.0	5.4	0.0
Cresol	86	0.0	4.2	0.0	4.2	0.0
Dichloromethane (methylene chloride)	186	2.6	0.0	0.0	2.6	0.0
Chloroform	127	2.0	0.0	0.0	2.0	0.0
Water-soluble zinc compounds	1	0.0	1.8	0.0	1.8	0.0
Toluene	300	1.0	0.0	0.0	1.0	36.9
Hydrazine	333	0.0	0.7	0.0	0.7	0.0
1,2-Epoxypropane (propylene oxide)	68	0.5	0.0	0.0	0.5	2.6
1,2-Dichloropropane	178	0.4	0.0	0.0	0.4	211.9
Carbon tetrachloride	149	0.2	0.0	0.0	0.2	0.0
Benzene	400	0.1	0.0	0.0	0.1	0.0
2,2'-Azobisisobutyronitrile	16	0.0	0.0	0.0	0.0	0.0
Hydroterphenyl	238	0.0	0.0	0.0	0.0	0.0
Water-soluble copper salt	272	0.0	0.0	0.0	0.0	0.0
Hydrogen fluoride and its water-soluble salt	374	0.0	0.0	0.0	0.0	0.0
Boron compounds	405	0.0	0.0	0.0	0.0	0.0
(Dioxins)	243	6.4	2.2	0.0	8.7	0.0
Total (excluding dioxins)		32.9	6.7	0.0	39.6	251.7

Substances are listed in descending order of emissions and, for substances with no emissions, in order of government ordinance number. Emissions to water indicate the release into public waters. Amount transferred indicates the sum of the quantity transferred to sewerage and the quantity subject to intermediate treatment. Total figures are rounded to the first decimal place.



Fumiaki Iwasaki
General Manager of the
Kashima Factory

Kashima Factory

Location: 26, Sunayama, Kamisu-shi, Ibaraki Prefecture, Japan

Employees: 78

Factory Area: 101,000 square meters

Main Products: Tokuyama Corporation's Kashima Factory

Pharmaceutical bulks (X-ray contrast agents, stomach and duodenal ulcer treatment drugs);
optical materials (plastic lens monomer, light modulating materials, hard coating solutions); materials for electronic materials and metal washing solutions

Main Products: Tokuyama Dental Corporation's Kashima Factory

Dental materials (restorative materials, adhesives, denture relining materials, impression materials and investing materials)

At the Kashima Factory, we have positioned the appropriate management of chemical substance handling as our most important issue and are promoting waste recycling. As a result, in fiscal 2012 we achieved an effective waste utilization rate of 81%, maintaining the high level we marked in fiscal 2011.

Looking ahead, we will look into the possibilities of material and thermal recycling for handling more categories of waste with the aim of further improving our effective utilization rate for all the waste we generate.

In addition, our final landfill volume remained at only seven metric tons, staying unchanged from the record-low volume we achieved in the previous fiscal year. Also, the zero-emission rate at our factory exceeded 99% in fiscal 2012.

For some products, Tokuyama Dental Corporation has switched from materials containing dichloromethane to water-based materials, as part of efforts to reduce dichloromethane emissions into the atmosphere. Consequently, overall emission volume decreased 20% compared with the previous fiscal year.

Performance Data

	Unit	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
Industrial Water Consumption	Thousand metric tons	78	44	77	71	76
Effluent	Thousand metric tons	95	58	93	90	96
COD Level	Metric tons	4	2	4	4	4
PRTR Substance Emissions	Metric tons	5	4	2	2	1
Waste Generated	Metric tons	770	560	857	909	930
Final Waste Disposal Volume	Metric tons	27	11	12	7	7
Energy Consumption	Thousand GJ	55	53	60	57	59
CO ₂ Emissions (attributable to fossil fuel)	Metric tons	2,230	2,110	2,340	2,324	2,399
Complaints	Complaints	0	0	0	0	0

* The calorific power and other figures have been recalculated retrospectively to 1990, following the amendment of the Act on the Rational Use of Energy.

Emissions and Transfer of PRTR Substances in Fiscal 2012

Unit: metric tons

Substance	Government Ordinance Number	Emissions				Amount Transferred
		To Air	To Water	To Soil	Subtotal	
Chloroform	127	0.7	0.0	0.0	0.7	2.1
Toluene	300	0.4	0.0	0.0	0.4	21.2
Dichloromethane (methylene chloride)	186	0.3	0.0	0.0	0.3	1.0
Acetonitrile	13	0.0	0.0	0.0	0.0	3.2
Alpha-Methylstyrene	149	0.0	0.0	0.0	0.0	0.0
1,4-Dioxane	150	0.0	0.0	0.0	0.0	0.1
N,N-Dimethylacetamide	213	0.0	0.0	0.0	0.0	1.2
N,N-Dimethylformamide	232	0.0	0.0	0.0	0.0	24.5
Triethylamine	277	0.0	0.0	0.0	0.0	3.7
2-Vinylpyridine	338	0.0	0.0	0.0	0.0	0.4
2,3-Epoxypropyl Methacrylate	417	0.0	0.0	0.0	0.0	0.0
Total		1.4	0.0	0.0	1.4	57.4

Substances are listed in descending order of emissions and, for substances with no emissions, in order of government ordinance number. Emissions to water indicate the release into public waters. Amount transferred indicates the sum of the quantity transferred to sewerage and the quantity subject to intermediate treatment. Total figures are rounded to the first decimal place.

Tokuyama understands that RC activities should be conducted on a Groupwide basis. To support their activities, the Company has signed RC management agreements with Tokuyama Group companies, both inside and outside Japan, that are engaging in production activities.

We collect data on the environmental impact of Group companies and their safety management indicators and conduct safety, environmental and quality audits at the rate of several Group companies per year. By means of these actions, we monitor and enforce RC activities conducted at individual Group companies. Also, changes and other movements in statutory regulations and other information are shared with our Group companies.

In addition, we provide Group companies with assistance in acquiring ISO 9001 and ISO 14001 certification.

Status of ISO 9001 and ISO 14001 Certification

Group Company	ISO 9001	ISO 14001	Group Company	ISO 9001	ISO 14001
Sun-Tox Co., Ltd.	●	●	Tokuyama Siltech Co., Ltd.	●	●
Excel Shanon Corporation	●	—	Sun Arrow Chemical Co., Ltd.	—	●
Tohoku Shanon Co., Ltd.	●	●	ASTOM Corporation	●	●
A&T Corporation	●	●	Shin Dai-ichi Vinyl Corporation	—	●
Figaro Engineering Inc.	●	—	Tokuyama Polypropylene Co., Ltd.	●	●
Tokuyama Dental Corporation	—*	●			

● = Certified ● = Included in certified sites
*Certified under ISO 13485

Sun-Tox Co., Ltd.

Established: February 14, 1992

Head Office: Tokuyama Bldg., 1-4-5, Nishi Shimbashi, Minato-ku, Tokyo, Japan

Ownership: Tokuyama Corporation (100%)

Business: Manufacture and sale of biaxial-oriented polypropylene films and cast polypropylene films

Kanto Plant



Performance Data

	Unit	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
Waste Generated	Metric tons	34	43	56	57	26
Final Waste Disposal Volume	Metric tons	5	16	38	43	7
Energy Consumption	Thousand GJ	327	334	344	341	340
CO ₂ Emissions	Thousand metric tons	18	18	19	19	19
SO _x Emissions	Metric tons	0.4	0.3	0.3	0.4	0.3
NO _x Emissions	Metric tons	0.7	0.5	0.6	0.7	0.6
Soot Emissions	Metric tons	0.08	0.05	0.04	0.04	0.03



Yasukazu Shiraishi
Plant Manager

Location: 3075-18, Shimasu, Itako-shi, Ibaraki Prefecture, Japan

Employees: 187

Site Area: 55,800 square meters

Located in the Itako Industrial Park in Ibaraki Prefecture, the Kanto Plant produces 25,000 metric tons of biaxial-oriented and cast polypropylene films per year. As a Type I Energy Management Designated Facility, it has been pursuing medium- and long-term efforts to improve its unit energy consumption index. As one such effort, we are changing over lighting installed in the plant facilities to LEDs. This move aims to not only conserve energy but also raise employees' energy saving awareness by implementing easily visible steps.

We have obtained certification for three management systems covering occupational safety and health (OSHMS), the environment (ISO 14001) and quality (ISO 9001) and are continuously implementing a PDCA cycle to enhance these systems. We are also striving to create a plant that harmoniously coexists with local communities.

As a part of our regional contribution activities, in fiscal 2013 we will undertake cleanup activities around the festival ground of the Itako Ayame Matsuri community festival.

Tokuyama Plant



Performance Data

	Unit	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
Waste Generated	Metric tons	120	90	80	70	67
Final Waste Disposal Volume	Metric tons	20	6	9	1	2
Energy Consumption	Thousand GJ	413	414	434	448	445
CO ₂ Emissions	Thousand metric tons	24	25	26	26	26
PRTR Substance Emissions	Metric tons	—	0.1	0.1	0.0	0.0
Complaints	Complaints	0	0	0	0	0



Naoki Ueda
Naoki Ueda

Location: 7-7, Harumi-cho, Shunan-shi, Yamaguchi Prefecture, Japan

Employees: 134

Site Area: 24,100 square meters

Located on the premises of the Higashi Plant in Tokuyama Corporation's Tokuyama Factory, the Tokuyama Plant produces 23,000 metric tons per year of biaxial-oriented polypropylene films, which are mainly used for food wrapping. In its environment-related activities, the Tokuyama Plant is proactively pursuing the reduction of production losses as well as resource recycling, aiming to steadily curb waste generation.

The Tokuyama Plant obtained certification for the Occupational Safety and Health Management System (OSHMS) in 2008. In fiscal 2013, plans call for undergoing an examination for the expansion of the scope of the OSHMS to include our development functions. Under the slogan of "Take pleasure in production, be stringent with quality and adhere to safety," we are pursuing plant operations that deserve the lasting trust of society, customers and employees.

Sun Arrow Chemical Co., Ltd.

Established: February 1, 1999

Ownership: Tokuyama Corporation (100%)

Head Office: Nakanoshima Central Tower, 2-2-7, Nakanoshima, Kita-ku, Osaka, Japan

Business: Manufacture and sale of polyvinyl chloride compounds

Tokuyama Plant



Performance Data

	Unit	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
Power Consumption	Thousand kWh	2,810	2,662	2,735	2,763	2,455
Waste Plastics Generated	Metric tons	157	119	124	110	107
Waste Plastics Effectively Used	Metric tons	157	119	124	110	107
Final Waste Disposal Volume (external)	Metric tons	0.6	3.8	12.5	10	15
Steam Consumption	Metric tons	240	240	240	240	240
Industrial Water Consumption	Thousand metric tons	65	65	65	65	65



Yasuto Yasuzawa
Plant Manager

Location: 1-2, Harumi-cho, Shunan-shi, Yamaguchi Prefecture, Japan

Employees: 24

Site Area: 3,280 square meters

Located on the premises of the Higashi Plant in Tokuyama Corporation's Tokuyama Factory, our Tokuyama Plant manufactures pipes and joints, which are essential to developing infrastructure, in addition to polyvinyl chloride compounds, which are used in such products as plastic window sashes to attain excellent energy conservation effects.

To protect the environment, we have been promoting the ISO 14001 management system. With respect to security and disaster prevention, we proactively carried out full-participation Five-S activities and Hiyari Hatto accident prevention activities to ensure a trouble-free status. As a result of these activities, we have successfully maintained our zero-accident and zero-disaster record since our establishment.

Placing the utmost priority on safety in all aspects of our operations, we will pursue RC activities in fiscal 2013 while thoroughly implementing internal control.

Tokuyama Polypropylene Co., Ltd.

Established: April 2, 2001

Ownership: Tokuyama Corporation (50%) and Prime Polymer Co., Ltd. (50%)

Head Office: 1-1, Harumi-cho, Shunan-shi, Yamaguchi Prefecture, Japan

Business: Manufacture and sale of polypropylene resin and soft polyolefin resin

Tokuyama Plant



Performance Data

	Unit	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
Industrial Water Consumption	Thousand metric tons	322	354	329	366	343
Waste Generated	Metric tons	159	134	180	123	160
Final Waste Disposal Volume	Metric tons	18*	6.5	3.8*	0	1.9*
Unit Energy Consumption Index (Fiscal 2002 = 100)	%	98	97	86	88	88

* Year with periodic maintenance



Hiroaki Endo
Plant Manager

Location: 1-1, Harumi-cho, Shunan-shi, Yamaguchi Prefecture, Japan

Employees: 63

Site Area: 70,997 square meters

The Tokuyama Plant is located on the premises of the Higashi Plant, which, in turn, constitutes part of the Tokuyama Factory of Tokuyama Corporation. This plant runs safety management, environmental management, and quality management systems and undertakes RC activities in tandem with the Tokuyama Factory. With respect to safety management, we perform risk assessments of processes, facilities, and work. We are also promoting Companywide Hiyari Hatto Kigakari (HHK) accident prevention and hazard identification activities to eradicate accidents, disasters and risks. As a result of these efforts, we succeeded in maintaining the zero-accident and zero-disaster status that we have enjoyed for 38 years, since the days when we operated as Tokuyama Corporation's Polypropylene Manufacturing Department.

In fiscal 2013, we will step up RC activities in a bid to maintain our zero-accident and zero-disaster record, to reduce our environmental footprint, and to eliminate all customer quality complaints.

- Tokuyama's Environmental Data
- SO_x, NO_x and Soot Emissions
- Nitrogen and Phosphorus Emissions
- Waste Management
- Unit Energy Consumption Index (Tokuyama Factory)
- Unit Consumption of Waste and By-Products in Cement
- Material and Thermal Recycling Volumes in Cement Production
- Energy Consumption
- CO₂ Emissions
- PRTR Substance Emissions
- Hazardous Air Pollutant Emissions
- Industrial Effluent and COD Level
- Breakdown of Industrial Waste by Treatment
- Landfill Volume and Effective Utilization Rate, etc.

Tokuyama's Environmental Data

Input (1,000 metric tons)	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012	Year-on-Year Changes (%)
Waste and By-Products	1,785	1,630	1,500	1,680	1,780	0.6%
Fuel	2,000	2,120	2,020	2,270	2,150	-5.0%
Raw Materials	7,080	5,910	5,390	5,880	5,650	-3.9%
Industrial Water	40,600	41,800	40,500	43,900	41,300	-5.9%
Output (1,000 metric tons)	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012	Year-on-Year Changes (%)
Carbon Dioxide (CO ₂)	6,850	6,420	6,170	6,510	5,800	-10.9%
Waste (incinerated and landfill)	21	19	20	21	20	-4.8%
Substances with Environmental Impact	12	10	10	11	10	-9.0%
Substances with Environmental Impact	22,900	20,600	25,600	24,300	24,900	2.5%

SO_x, NO_x and Soot Emissions

Unit: metric tons	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012	Year-on-Year Changes (%)
SO _x	1,190	1,300	1,630	2,180	1,450	-33.5%
NO _x	10,100	8,800	8,000	8,600	8,400	-2.3%
Soot	161	137	148	191	190	5.0%

Nitrogen and Phosphorus Emissions

Unit: metric tons	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012	Year-on-Year Changes (%)
Nitrogen	108	140	110	108	94	-13.0%
Phosphoru	2.9	3.6	2.3	2.8	2.7	-3.6%

Waste Management

Unit: metric tons	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012	Year-on-Year Changes (%)
Internal Recycling	304	260	271	331	337	1.8%
External Recycling	20.5	20.8	21.1	27.3	25	-8.4%
Incineration	20.0	18.9	20	21	19.7	-6.2%
Landfill	0.5	0.4	0.4	0.5	0.3	-0.4%

- Tokuyama's Environmental Data
- SOx, NOx and Soot Emissions
- Nitrogen and Phosphorus Emissions
- Waste Management
- Unit Energy Consumption Index (Tokuyama Factory)
- Unit Consumption of Waste and By-Products in Cement
- Material and Thermal Recycling Volumes in Cement Production
- Energy Consumption
- CO₂ Emissions
- PRTR Substance Emissions
- Hazardous Air Pollutant Emissions
- Industrial Effluent and COD Level
- Breakdown of Industrial Waste by Treatment
- Landfill Volume and Effective Utilization Rate, etc.

Unit Energy Consumption Index* (Tokuyama Factory)

Unit: metric tons	Fiscal 1990 (benchmark year)	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
Reduction Rate (%)	0	-18.6	-22.4	-24.6	-24.2	-22

* The unit energy consumption index is calculated using a method recommended by the Japan Chemical Industry Association (JCIA).

Unit Consumption of Waste and By-Products in Cement

kg/metric tons of cement	Fiscal 1991 (benchmark year)	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
Unit Consumption	277	424	414	430	446	458

Material and Thermal Recycling Volumes in Cement Production

Unit: 1,000 metric tons	Fiscal 1991 (benchmark year)	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
Material Recycling	1,550	1,947	1,561	1,430	1,610	1,720
Thermal Recycling	91	80	70	67	70	65

Energy Consumption

Unit: 1,000 GJ/year	Fiscal 1990 (benchmark year)	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
Tokuyama Corporation	37,600	52,500	50,700	49,900	52,500	44,200
Group Companies	—	2,800	2,700	2,800	2,800	2,600

CO₂ Emissions

Unit: 1,000 metric tons	Fiscal 1990 (benchmark year)	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
Emissions Attributable to Fuel	3,290	4,730	4,570	4,510	4,730	4,020
Emissions Attributable to Raw Materials	1,930	2,000	1,620	1,420	1,550	1,570
Emissions Attributable to Waste	20	250	230	240	230	210
Group Companies	—	210	200	200	210	190

- Tokuyama's Environmental Data
- SO_x, NO_x and Soot Emissions
- Nitrogen and Phosphorus Emissions
- Waste Management
- Unit Energy Consumption Index (Tokuyama Factory)
- Unit Consumption of Waste and By-Products in Cement
- Material and Thermal Recycling Volumes in Cement Production
- Energy Consumption
- CO₂ Emissions
- PRTR Substance Emissions
- Hazardous Air Pollutant Emissions
- Industrial Effluent and COD Level
- Breakdown of Industrial Waste by Treatment
- Landfill Volume and Effective Utilization Rate, etc.

PRTR Substance Emissions

Unit: metric tons	Fiscal 1998 (benchmark year)	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
Tokuyama Corporation	237	70	50	38	34	40
Group Companies	—	29	29	38	40	41

Hazardous Air Pollutant Emissions

Unit: metric tons	Fiscal 1995 (benchmark year)	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
Dichloromethane (methylene chloride)	28	4	2	3	1	3
Chloroform	7	4	3	1	1	3
1,2-Dichloroethane	47	12	9	8	8	10
Chloroethylene (vinyl chloride)	21	11	8	10	11	11

Industrial Effluent and COD Level

Unit: 1,000 metric tons	Fiscal 1990 (benchmark year)	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
Industrial Effluent (million metric tons)	14.3	22.9	20.6	25.6	24.3	24.9
COD Level (metric tons)	180	120	109	128	123	123

Breakdown of Industrial Waste by Treatment

Unit: 1,000 metric tons	Fiscal 2007	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
Internal Recycling	324	304	260	271	331	337
External Recycling	18.4	20.5	20.8	21.1	27.3	25.0
Incineration	21	20	18.9	20	21	19.7
Landfill	0.5	0.5	0.4	0.4	0.5	0.3
Total Waste Generation	364	345	300	313	380	382

Landfill Volume and Effective Utilization Rate, etc.

Unit: 1,000 metric tons	Fiscal 1990 (benchmark year)	Fiscal 2008	Fiscal 2009	Fiscal 2010	Fiscal 2011	Fiscal 2012
Landfill Volume (1,000 metric tons)	36,260	480	440	430	500	330
Effective Utilization Rate (%)	76.9	94.1	93.5	93.5	94.4	94.7
Zero-Emission Rate (%)	82.4	99.9	99.9	99.9	99.9	99.9