

CSR Report 2019



Cover

The cover shows materials made by the Tokuyama Group as well as products and services that are delivered to society using those materials. The illustrated lines connecting animals, nature, people and society represent Tokuyama's efforts to create new value for the future.

Harnessing the Potential of Chemistry to Shape the Next Century

Since its founding in 1918, the Tokuyama Group has overcome many obstacles on its quest to deliver products and services that truly benefit people's lives. From the production of soda ash in Japan to cement and diverse chemicals, Tokuyama makes the most of its technology and experience to serve a wide range of sectors including electronics, ICT, healthcare, environment, and energy. As it embarks on another 100 years in business, Tokuyama will keep striving to create innovative products and services to deliver on its mission: "Centered on the field of chemistry, the Tokuyama Group will continue to create value that enhances people's lives."

TOKUYAMA VISION

Mission

Centered on the field of chemistry, the Tokuyama Group will continue to create value that enhances people's lives

Aspirations

Shift from a focus on quantity to quality

<FY2025>

Global leader in advanced materials
Leader in its traditional businesses in Japan

Values

Customer satisfaction is the source of profits

A higher and broader perspective

Personnel who consistently surpass their predecessors

Integrity, perseverance, and a sense of fun

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Creating Value That Benefits People's Lives through Chemistry



Hiroshi Yokota
 Hiroshi Yokota
 President

Defining Materiality to Accelerate Corporate Social Responsibility

The Tokuyama Group is earnestly striving to fulfill its corporate social responsibility (CSR). We have conducted a materiality assessment to identify priority issues for our CSR initiatives. This is to ensure that Tokuyama will supply value to society while conducting a sustainable business. We are now directly addressing the material issues that we identified and implementing solutions, seeking to leverage our superior technologies as a chemicals company to help address social issues.

Strengthening Corporate Governance

Two years ago, we shifted our governance structure to that of a company with an Audit & Supervisory

Committee. This structure gives voting rights to the directors who comprise the Audit & Supervisory Committee, effectively increasing their supervisory responsibilities and encouraging them to better understand the business details before voting. It has also strengthened the monitoring functions.

In April 2019, we revised our independence criteria for outside directors, which were overly restrictive and unrealistic. The change has given us greater flexibility to broadly appoint capable outside directors, which in turn is strengthening our corporate governance.

Responsible Care

Safety continued to be our highest priority in fiscal 2019. Pursuing safety and accident prevention, we conducted emergency inspections at all of the Group's production facilities, following up on a fire at the Kashima Factory in 2018. As part of these, we

undertook comprehensive inspections of all processes, including checking for compliance violations, and immediately addressed any issues identified. In cases when processes were undergoing change, we reviewed legal issues and conducted relevant risk assessments.

In terms of environmental management, we rechecked the processes at all of the Group's production facilities, accompanying the safety and accident prevention inspections. We will also continue to conduct accident prevention and initial response drills to maintain the trust that we have built with local residents and local governments.

Establishing CO₂ Emission Reduction Targets

The Tokuyama Group has established a target of achieving a 15% reduction in CO₂ emissions of business as usual (BAU) by fiscal 2030, compared with fiscal 2013 levels, and is striving to surpass these targets. While doing our utmost to achieve this target, we aim to narrow the gap to even higher targets. Japan is studying the possible adoption of carbon pricing, which could change our investment criteria. As a thermal power plant operator, we recognize our responsibility to shift to renewable energy and develop technologies to reduce our CO₂ emissions as a requirement for our future.

Developing Products That Address Social Issues

We received an award from Japan's Minister of the Environment in recognition of the beneficial social impact of our waste gypsum board recycling business. Our expertise in chemicals allows us to offer solutions to environmental issues. We will leverage our technologies to create businesses that help address environmental issues, such as deploying our ion exchange membrane technology for waste water treatment, and using renewable energy to manufacture hydrogen with a zero carbon footprint.

Among information and communications technology (ICT) applications, one of our major products is heat dissipation materials for semiconductors. These

materials are essential to improving the performance of power semiconductors which are in increasing demand with the growing popularity of electric vehicles. In the future, we will develop materials that go beyond heat dissipation, contributing to overall thermal management.

In the healthcare field, we are accelerating development of innovative new products such as dental materials and devices, and eyeglass materials. In the pharmaceutical business, we will develop products that broadly contribute to people's health, in addition to manufacturing bulk pharmaceuticals for generic drugs. We will also seek to develop consumer products such as for pets and livestock.

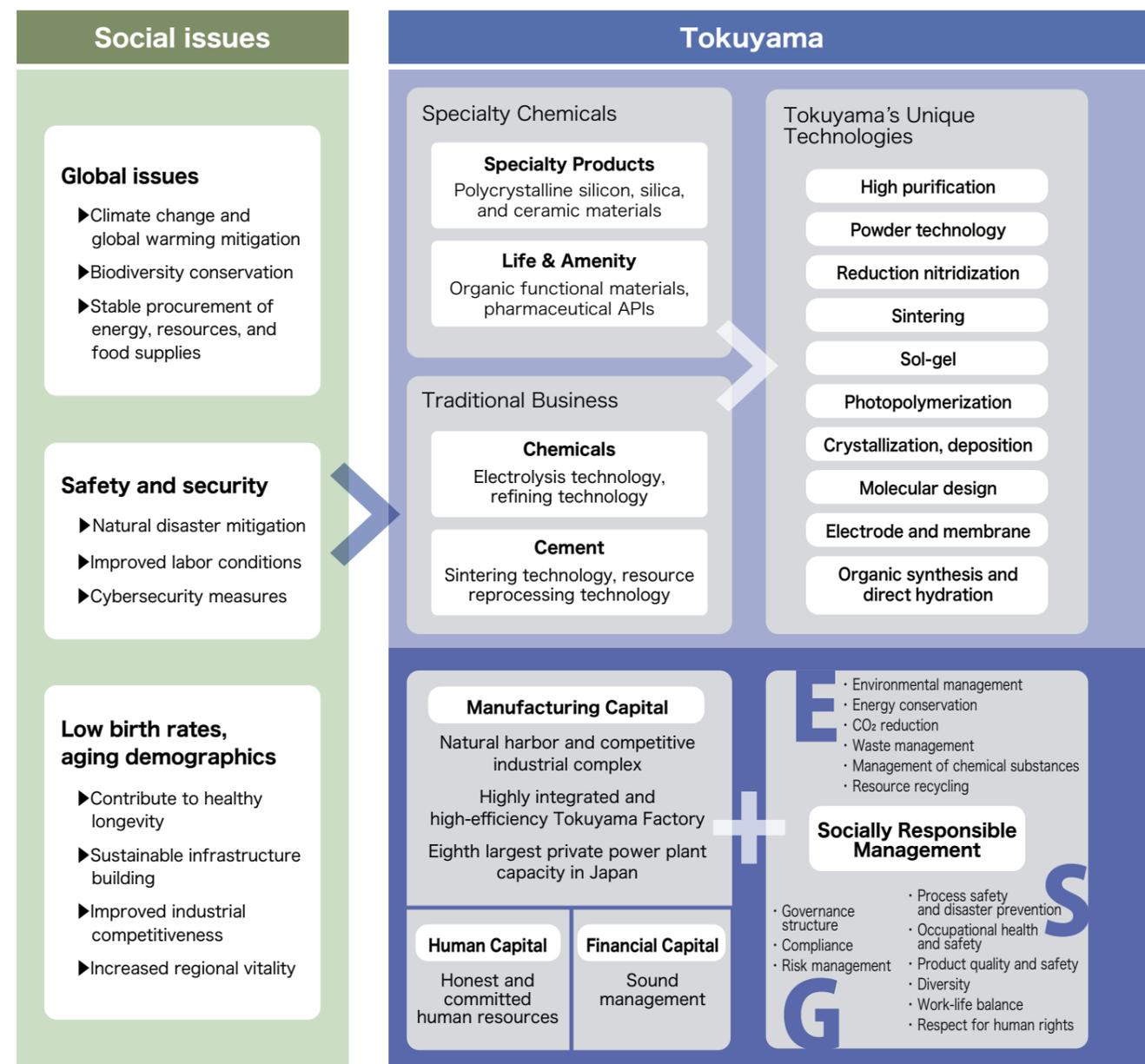
Transforming Our Corporate Culture and Encouraging Women in the Workplace

We are working hard to transform our corporate culture by increasing communication in the workplace and promoting a fresh mindset among employees. The most important element in the value creation process is time. This is why we are focusing in changing how employees approach time, while working to eliminate gaps in internal communication that slow down our business execution.

The percentage of women in our workforce is still low, despite our efforts to promote diversity. To achieve more progress, much change is needed—for instance to personnel regulations and employee attitudes. We will deploy more women on the production floor so that they can leverage their skills, while making other improvements to develop the skills and advance the careers of women. We will also establish flexible work provisions so that women who wish to return to work soon after having children are not restricted in their opportunities.

The Value Creation Process at Tokuyama

In pursuing the Tokuyama Group's mission of creating value that benefits people's lives through chemistry, we practice CSR in management, based on management resources amassed over a century in business, and conduct our business activities with consideration for environmental, social, and governance performance. You can count on the Tokuyama Group to do its part in building a sustainable world by leveraging its core technologies to supply products that help solve social issues.



How Tokuyama's Business Addresses the SDGs

The Tokuyama Group is committed to contributing to the achievement of the Sustainable Development Goals (SDGs) adopted by the United Nations General Assembly in September 2015. The Group verifies that its products and business activities are in alignment with the SDGs in the conduct of its business. The Tokuyama Group will continue to pursue R&D with a view to contributing to the SDGs, seeking to be of value to society and remain the choice of customers.



Adopted by the United Nations, the SDGs address issues facing all of humanity. Meeting these goals by the target year of 2030 will require global-scale cooperation.

SDG-Oriented Products

Customer-oriented R&D and business activities

Environment & Energy

- ▶ Liquid hydrogen
- ▶ Recycling of industrial waste
- ▶ Utilization of waste plastic for fuel
- ▶ PVC window



ICT

- ▶ Semiconductor materials
- ▶ Thermal management materials
- ▶ High-purity chemicals for electronics manufacturing



Healthcare

- ▶ Bulk pharmaceutical ingredients
- ▶ Microporous film
- ▶ Dental materials
- ▶ Medical diagnosis systems



Creating Value That Benefits People's Lives through Chemistry

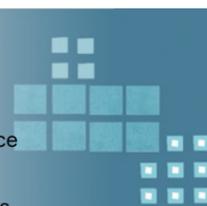
Creating a low-carbon, recycling oriented society

Tokuyama helps to build a more sustainable society by recycling waste plastics, sludge, and other refuse, and by reusing co-products generated by manufacturing processes.



Supporting innovation

By enabling higher performance and efficiency in consumer electronic and energy products, Tokuyama helps to make society more convenient and prosperous.



Contributing to health and longevity

Tokuyama provides products for pleasant and healthy living. Especially notable are bulk pharmaceuticals for generic drugs, and plastic lens materials produced with its unique organic synthesis technology.



Tokuyama and CSR

The Tokuyama Group practices corporate social responsibility (CSR) by realizing its vision of leveraging chemistry to create value that benefits people's lives. The Group will leverage its chemical technologies and implement CSR-oriented management to continue creating and supplying new value that brings contentment to people and contributes to social progress.

Tokuyama has created this symbol for CSR promotion. Depicting a sunflower, the symbol is intended to convey the Company's active, healthy and honest stance toward CSR. Under this symbol, the Tokuyama Group will not only pursue compliance and efficiency in its business operations, but will also work to develop into a vibrant, sound corporate entity that is socially and environmentally beneficial and is trusted by all stakeholders.



Tokuyama Vision and CSR

In May 2016, Tokuyama adopted a corporate vision of "Creating value that benefits people's lives through chemistry." This vision guides Tokuyama's efforts to fulfill its social responsibilities.

In the vision, Tokuyama articulates an aspiration to "Shift from a focus on quantity to quality." The Tokuyama Group recognizes that it must practice CSR-oriented management if it is to shift to qualitative growth in addition to quantitative growth. In March 2018, Tokuyama revised its basic philosophy for CSR-oriented management to state that the Group will "continuously work with society to build a sustainable future by contributing to the resolution of social issues."

Tokuyama is working on two fronts to realize its mission of creating value that benefits people's lives. Firstly, it is conducting R&D to create products that address social issues. Secondly, it is implementing internal controls to anchor its CSR initiatives, and practicing risk management and compliance in order to meet social responsibilities across all business processes. As a chemical manufacturer, Tokuyama also recognizes that practicing Responsible Care represents a major social responsibility, and it has a corporate framework in place for Responsible Care. This framework ensures the operating and continuous improvement of management systems for safety, the environment, and quality.

Tokuyama Group's CSR Framework



Basic Philosophy of Tokuyama's CSR-Oriented Management

Tokuyama approaches its CSR activities in accordance with a basic philosophy of continuously working with society to build a sustainable future by contributing to the resolution of social issues and earning greater trust from various stakeholders with the aim of improving corporate value.

CSR Framework

Tokuyama operates a CSR Promotion Council that is chaired by the president and comprises all executive officers in Japan. The Council decides on the policies and goals related to CSR, and facilitates Tokuyama's CSR initiatives. CSR initiatives are anchored in the suitable execution of corporate governance and internal controls, so the CSR Promotion Council also discusses important matters relating to internal controls.

The Risk Management and Compliance Committee operates under the CSR Promotion Council, and is chaired by the director responsible for the Corporate Social Responsibility Division. The Committee promotes risk management and compliance, which are central to internal controls.

Tokuyama operates committees focused on risk management and compliance in seven critical and specialized areas, separately from the Risk Management and Compliance Committee. The committees operate under the CSR Promotion Council, overseeing the following areas: financial reporting, fair trade and competition, international security trade, information security, environment, safety, and product safety and quality assurance.



*The plan-do-check-act (PDCA) cycle is a four-stage approach for continually improving processes, products or services, and for resolving problems.

Voice)))

Pursuing CSR Initiatives as an Integral Part of Our Business Activities

"Creating value that benefits people's lives through chemistry" is the keystone to Tokuyama's existence and has been our core heritage for a century in business. Our approach of resolving social issues through corporate activities is precisely how we practice corporate social responsibility in management.

In order to remain worthy of the public's trust, Tokuyama gives utmost priority to disaster prevention and safety, while strengthening internal controls to enhance stakeholder confidence. We also have a duty as a chemicals manufacturer to ensure the safety and quality of our products and reduce environmental impact, and we do this by practicing Responsible Care.

Hideo Sugimura
Director, Managing Executive Officer
in charge of Corporate Social Responsibility



In the process of incorporating the SDGs into our management priorities, we adopted an outside-in approach to ensure we saw the perspective of society, adding to the inside-out approach of our company's perspective. We reviewed the Group's CSR issues from both perspectives and identified nine SDGs that are of material importance to the Group.

Moving forward, we will seek to achieve our material goals as management priorities and pursue CSR initiatives as an integral part of our business activities, as we work to build a sustainable future.

Materiality Determination

Tokuyama has been pursuing a variety of initiatives in an effort to create value that benefits people's lives. In order to pursue its CSR initiatives, Tokuyama conducted a materiality assessment to identify its priority issues encompassing the perspective of environmental, social, and governance (ESG) issues. Tokuyama has made it a management priority to strategically tackle these material issues, and will disclose the details of its initiatives and the outcomes so that they can be readily understood.

Identifying Materiality

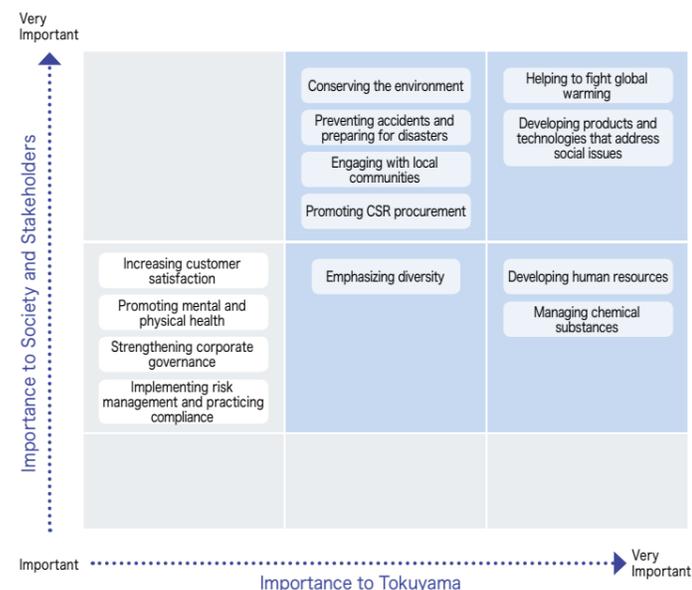
In March 2019, Tokuyama conducted a materiality assessment to align its CSR initiatives and management priorities. This assessment extracted and identified issues that are of particular material importance to Tokuyama, so that it can concentrate its management resources on resolving these issues.

The assessment used the important social issues outlined in the ISO 26000 standards and Global Reporting Initiative (GRI) guidelines as a starting point. The stakeholder issues, issues from the medium-term management plan, and CSR goals were then reviewed to extract the CSR issues. The importance of the issues was rated from both a stakeholder and corporate perspective, and assessed for materiality as per the GRI Standard. Through this process, 13 issues of material importance were selected. Key performance

indicators (KPIs) were designated for each issue, and the issues were ranked in terms of importance. After the priority and quantification of the material issues was reviewed based on third party feedback, the CSR Promotion Council made the decision to designate nine material issues and four CSR issues.

Starting in fiscal 2019, Tokuyama will implement PDCA management by verifying the action taken on material issues and achievement of KPIs, as well as making necessary improvements. The material issues will be reviewed by assessing the progress of the initiatives as of fiscal 2020, at which time the order of priority and scope of impact (boundaries) will be reviewed. Additionally, Tokuyama will engage stakeholders and external authorities in dialogue to verify the suitability of the material issues.

Process for Identifying Material Issues



	Materiality	FY2020 Targets / Key Performance Indicators (KPIs)	Aspirations (FY2025)	
Environment	Helping to fight global warming ▶ p.12, 18	Manage energy conservation and per-unit energy consumption Disclose non-consolidated Scope 3 emissions and c-LCA* qualitative assessments Disclose GHG emissions including for Group manufacturing subsidiaries outside Japan	3% reduction (compared with FY2005 levels) Reduce CO ₂ emissions from energy consumption 15% reduction in BAU CO ₂ emissions by FY2030, compared with FY2013 levels Expand Scope 3 emissions and c-LCA disclosure data	
	Conserving the environment ▶ p.16, 22	Waste effective utilization rate Zero emissions to landfills Maintain low emissions of environmental impact substances Comply with legal requirements and other regulations, achieve zero environmental accidents	Maintain at 92% Maintain 99.9% reuse/recycling rate Zero accidents	Promote recycling and maintain zero landfill waste Maintain low emissions of substances with environmental impact Comply with legal requirements and other regulations, achieve zero environmental accidents
Safety and Accident Prevention Occupational Health and Safety	Preventing accidents and preparing for disasters ▶ p.26	Accidents and disasters (requiring work absence/no absence) Expand process safety training and drills Expand risk assessments, change management, and hazard prediction (<i>kiken yochi</i>) activities Utilize IoT and transfer skills Provide amenable working conditions	Zero accidents and disasters Maintain zero accidents and disasters Improve process safety management level Foster and improve the safety culture Provide amenable working conditions	
Technical Quality	Developing products and technologies that address social issues ▶ p.28	Develop products and technologies that help to resolve social issues, focusing on the SDGs	Expand product lines relating to IoT and heat dissipation, and create new businesses for related materials Expand and globalize product lines related to healthcare, and create new materials	
	Managing chemical substances ▶ p.21	Assess safety through product assessments Follow regulatory trends in and outside of Japan and practice compliance Continue to manage risk using Group-wide export control system	Zero infractions of chemical-related regulations Continue to strengthen chemicals management	
Society	Engaging with local communities ▶ p.39	Harmoniously co-exist and cooperate with communities Contribute to communities	Community dialogue Actively engage in community events Hire in the community Social initiatives Contribute to communities through the business	
	Promoting CSR procurement	Develop CSR procurement guidelines	Adopt CSR procurement guidelines that take into account not only the environment but also human rights, compliance, and other key issues Survey and manage supply chains based on CSR procurement guidelines	
	Developing human resources ▶ p.32	Develop the next generation of managers Put the right people in the right positions according to their career plan and job skills, and increase the job rotations	Develop the next generation of managers Put the right people in the right positions according to their career plan and job skills, and increase the job rotations Develop global human resources	
Emphasizing diversity ▶ p.13, 32	Promote diversity and inclusion Employ persons with disabilities Promote work-life balance Respect for human rights	KPIs for women in the workplace Employment rate: 2.2% Gender-free parenting/nursing care leaves Respect for human rights		
CSR issues				
	Increasing customer satisfaction	Promoting mental and physical health	Strengthening corporate governance	Implementing risk management and practicing compliance

*Consequential life-cycle assessment (c-LCA) is a method for assessing emissions throughout the life cycle, by adding up CO₂ emissions at each stage, from resource extraction, manufacturing, distribution, and use, to disposal.

Tackling the Challenge of Significantly Reducing CO₂ Emissions

The Tokuyama Group treats CO₂ emissions as a management risk. Pursuing a low-emission business model, the Group has now set CO₂ emissions reduction targets to achieve by fiscal 2030 and is working hard to achieve them.



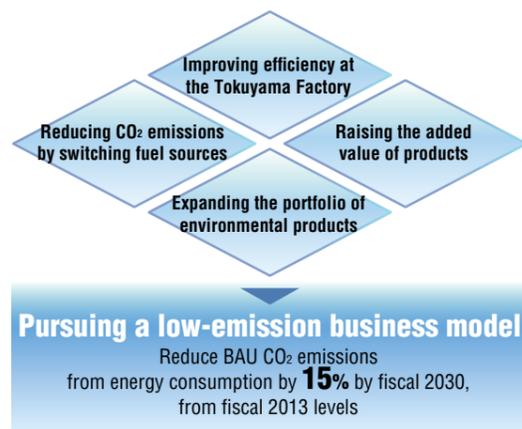
Material issue: **Helping to fight global warming**

Group-Wide Initiatives for Energy Conservation

The Tokuyama Group treats global warming as a priority issue, managing its per-unit energy consumption and per-unit GHG emissions to reduce CO₂ emissions. As of fiscal 2018, the Group had achieved a reduction of approximately 9% from fiscal 2005 levels. In fiscal 2018, the Group generated 4.4 million metric tons of CO₂ emissions from energy consumption.

Targeting a 15% Reduction of Business-as-Usual CO₂ Emissions

Under the Paris Agreement of the Conference of the Parties (COP) in 2015, Japan committed to a target of achieving a 26.0% reduction of CO₂ emissions by fiscal 2030, from fiscal 2013 levels. Of this, Japanese industry is expected to achieve a 6.5% reduction. In conducting its materiality assessment, the Tokuyama Group identified global warming as an issue of the highest priority. While continuing with its existing energy conservation initiatives, the Group is now also working to reduce CO₂ emissions from energy consumption in accordance with the Paris Agreement. Its new target is to achieve a 15% reduction of business-as-usual (BAU) CO₂ emissions by fiscal 2030, from fiscal 2013 levels.



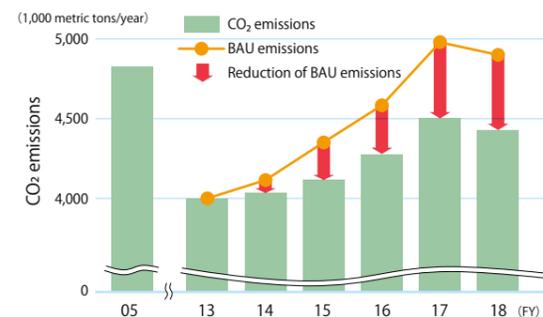
Action Strategies for Achieving FY2030 Targets

- Conduct multi-vector Group-wide initiatives to reduce CO₂ emissions
- While maintaining business composition, eliminate loss of available energy
- Actively study new technologies and business opportunities that arise in CO₂ emissions reduction initiatives
- Identify the strengths of the Tokuyama Group's products relative to rising energy costs, and increase the added value of products

Initiatives to Achieve CO₂ Emissions Reduction Target

The entire Tokuyama Group is striving to achieve the FY2030 emissions reduction target. The Tokuyama Factory comprehensively implements energy conservation initiatives to eliminate loss of available energy, and is also looking into CO₂ and heat recovery and utilization. R&D departments are studying the development of innovative technologies and business creation for environmental and energy applications, and developing environmentally friendly products. Business departments are shifting the composition of their businesses away from dependency on low-cost electricity to minimize CO₂ emissions risk.

Reduction of BAU CO₂ Emissions



Tokuyama's Workforce Worldwide

With global operations in eight countries and regions, Tokuyama employs diverse human resources reflecting differences in race, gender, nationality, and religion. Tokuyama is harnessing this diversity and the individuality and skills of each employee to increase corporate value.



Material issue: **Emphasizing diversity**

Appreciating Efforts to Build a Positive Workplace Environment

As China moves to tighten its laws and regulations, the cost of safety and environmental measures is increasing. Each of our employees must try to gain new knowledge and enhance their skills.

Having worked for Japanese companies ever since graduating from university, I am familiar with Japanese culture and customs. The Japanese staff of Tokuyama Chemicals (Zhejiang) have made an effort to create an atmosphere that is easy to work in, which has established very positive relations. I look forward to continuing to work with everyone to secure further growth for the company.



Ma Jun

Plant Manager
Tokuyama Chemicals (Zhejiang) Co., Ltd.
Joined the company in 2006

Plant Manager overseeing manufacturing and environmental safety

Open Culture Breeding Success

There are many differences in culture and working methods between Japan and France; for instance, the Japanese think prudently before making a choice. This is probably why Japanese products have a reputation for reliability, which is a result of long reflection. Our managers have always placed great trust in our working methods and have never sought to impose the Japanese method. In working together, it is under our own initiative that we apply the foundations of the "KAIZEN" with the 5S method and the "Kikenyochi," aware of the interest of these precepts. There are especially things that unite us between Japanese and French and it is first of all an attraction and know-how for beautiful and good things. Each person is different in

their functioning, qualities, skills and emotion, and has a different cultural, religious and educational background. This is what creates diversity and there are always benefits to take from others. Even if it is human nature to be resistant to change, we must be open to diversity in order to exchange our experiences and thus to improve by taking the best of everyone. I think that our Franco-Japanese collaboration in the management of Tokuyama Nouvelle Calédonie is a good example of success thanks to our diversity.

Loïc LE PEN

Sales Manager
Tokuyama Nouvelle Calédonie S.A.
Joined the company in 2001

Responsible for a wide range of tasks from cement marketing, advertising, and sales through to delivery and follow-up



Promoting Respect for Religious Diversity

In Singapore, the normal culture is work and family balance, but I realized that Japanese culture prioritizes work and to always work hard. The thing that impressed me is the challenge of solving equipment breakdown, figuring out how to solve a problem that we face unexpectedly and make the work of other departments easier.

In Singapore, I suggest that Tokuyama be more attentive to differences in religious beliefs and practices, including those of the Muslim workers.



Jamali Bin Othman

Assistant Manager
Tokuyama Electronic Chemicals Pte. Ltd.
Joined the company in 2000

Responsible for facilities equipment, maintenance work, and its documentation

Tokuyama's Responsible Care

Tokuyama has put in place a corporate framework for promoting Responsible Care,* and is incorporating this initiative in each of its management systems as it strives to continuously improve its environmental, safety, and quality systems.



Practicing Responsible Care

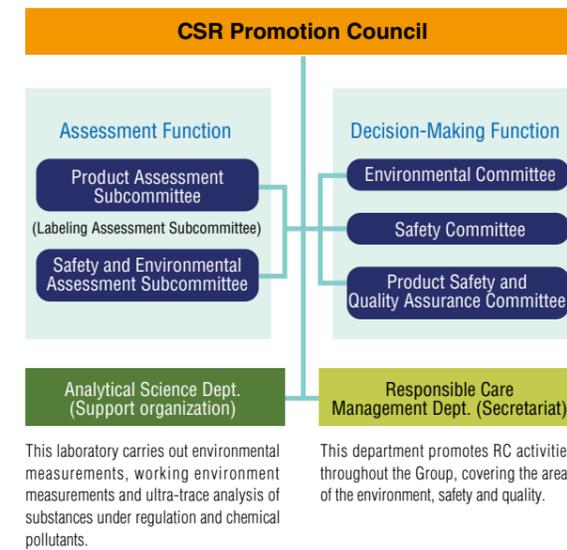
Responsible Care Initiatives

Tokuyama actively practices Responsible Care* as one of the original members of the Japan Responsible Care Committee established in 1995 under the Japan Chemical Industry Association (JCIA).

Framework for Promoting Responsible Care

The CSR Promotion Council is chaired by the President and Executive Officer and oversees the implementation of Responsible Care. The Council operates an Environmental Committee, Safety Committee, and Product Safety and Quality Assurance Committee, which discuss and make decisions in their respective areas of responsibility. The Council also operates subcommittees that serve as assessment bodies. Responsible Care practices are improved by implementing plan-do-check-act (PDCA) cycles focusing on environmental conservation, process safety and disaster prevention, occupational health and safety, and chemicals and product safety.

Responsible Care Promotion Structure



*Responsible Care is a voluntary management initiative undertaken by chemical manufacturers to implement measures that conserve the environment and secure safety and health in all processes from the development of chemical substances to their manufacturing, distribution, use, final consumption, and disposal. Companies publish their outcomes and engage in public dialogue.

Basic Philosophy of Responsible Care

Basic Policy

As a member of the Japan Responsible Care Committee, 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 and manufacturing to distribution, use, final consumption and disposal.

Our social mission is to aggressively tackle and systematically solve environmental issues in particular, which, in turn, will lead to sustainable corporate and social development. Based on this recognition, we promote Environmental Management, a management policy that emphasizes the environment, in all of our business activities, including development, manufacturing and sales.

Action Objectives

- Promote environmental protection**
 - Implement an ISO 14001-based Environmental Management System and reduce environmental impact
- Observe the laws and regulations**
 - Observe international rules, domestic laws and regulations and industrial standards
 - Thoroughly implement export management rules on materials under control
- Promote energy conservation and curb global warming**
 - Achieve top-class unit energy consumption in the industry for each

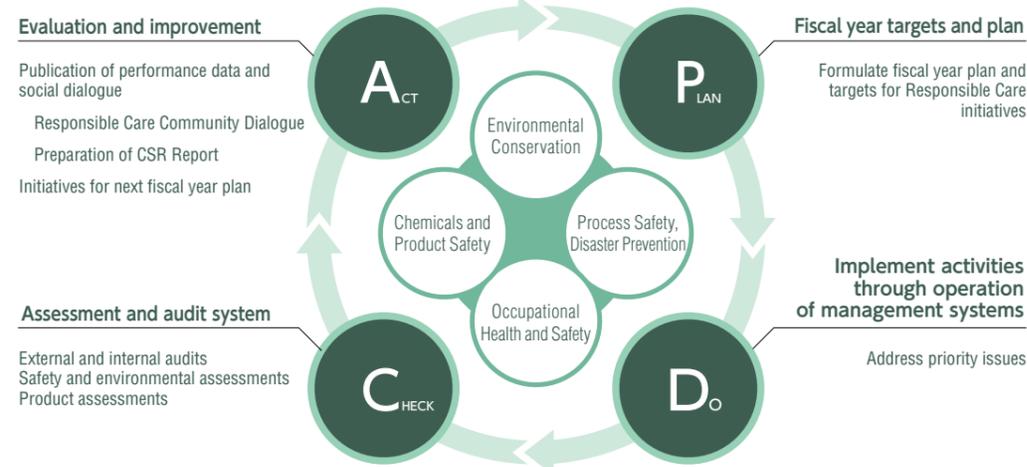
product

- Promote resource recycling and work toward reduction and the proper management of waste materials**
 - Promote the material recycling and thermal recycling of resources
 - Work toward achieving a paperless office
- Promote process safety, disaster prevention and occupational health and safety**
 - Aim for zero accidents and disasters based on the principles of self-responsibility and the self-management of safety
 - Achieve a comfortable working environment and protect people's safety and health
- Ensure strict product safety standards**
 - Offer environmentally friendly products that can be used with safety
 - Provide proper information on how to use products and what precautions to take
- Deepen the relationship of trust with society**
 - Publicly disclose information on the Company's activities concerning environmental protection, process safety and disaster prevention, occupational health and safety, and chemical product safety
 - Actively engage in dialogue with the local communities

Priority Tasks and Results of Responsible Care Activities in Fiscal 2018

Degree of target achievement: Achieved (A) Not achieved (B)

Category	Priority tasks	Results	Degree of target achievement
Environmental Conservation	<ul style="list-style-type: none"> Comply with legal requirements and other regulations Achieve zero environmental accidents Achieve targets for reducing environmental impact 	<ul style="list-style-type: none"> Strictly complied with legal requirements 1 incident exceeding limits set by the local government No environmental accidents Reduced or maintained levels of emissions of substances of concern Reduced per-unit energy consumption Zero emissions to landfills Maintain 99.9% reuse/recycling rate 	<p>B</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>
Safety and Accident Prevention Occupational Health and Safety	<ul style="list-style-type: none"> Achieve zero legal violations Ensure no accidents or disasters occur Reduce rate of work absences 	<ul style="list-style-type: none"> 2 recommendations for rectification measures under Japan's Industrial Safety and Health Act 2 accidents (fires) Employees: 3 injuries requiring work absence, 1 injury not requiring work absence Contractors: 1 injury requiring work absence, 1 injury not requiring work absence Improved safety management level Identified and reduced/eliminated risks Promoted risk and hazard management Promoted physical and mental health 	<p>B</p> <p>B</p> <p>B</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p>
Chemical Product Safety	<ul style="list-style-type: none"> Ensure product safety 	<ul style="list-style-type: none"> Conducted inspections of products and labeling Upgraded safety data sheet (SDS) management Addressed regulations on chemicals in countries outside Japan 	<p>A</p> <p>A</p> <p>A</p>
Build Relations of Trust with Local Communities and Society	<ul style="list-style-type: none"> Participate in community events Establish a good reputation in society 	<ul style="list-style-type: none"> Participated in community volunteer activities Held dialogues with the community on Responsible Care Held factory tours 	<p>A</p> <p>A</p> <p>A</p>
Promote Responsible Care at Group Companies	<ul style="list-style-type: none"> Expand the scope of Responsible Care activities 	<ul style="list-style-type: none"> Conducted safety, environment, and quality audits Shared Responsible Care information via an online newsletter, etc. Addressed regulations on chemicals in countries outside Japan 	<p>A</p> <p>A</p> <p>A</p>



Tokuyama's Environmental Management

For Tokuyama, the pursuit of proactive initiatives to protect the earth's environment is an important part of its corporate social responsibilities. Accordingly, the Company practices environmental management that takes into account the natural environment in all business activities.



In December 2017, Tokuyama received the Development Bank of Japan (DBJ) Environmentally Rated Loan, rated as having "advanced environmental initiatives."



Material issue: **Helping to fight global warming; conserving the environment**

Performance in Fiscal 2018

Flow of Materials in Business Activities

Tokuyama works to accurately determine the input and output of materials for production, and regularly sets new targets aimed at reducing environmental impact. In fiscal 2018, Tokuyama achieved its per-unit energy consumption, waste recycling and zero emissions targets. Regarding other performance data, Tokuyama has set a separate numerical management target for each department to maintain the current low-impact situation.

Environmental Accounting

Tokuyama has been carrying out environmental accounting since fiscal 2000 in order to accurately

determine and analyze the investment amounts and costs associated with its environmental conservation activities, thereby providing a sound basis for making environmental investments.

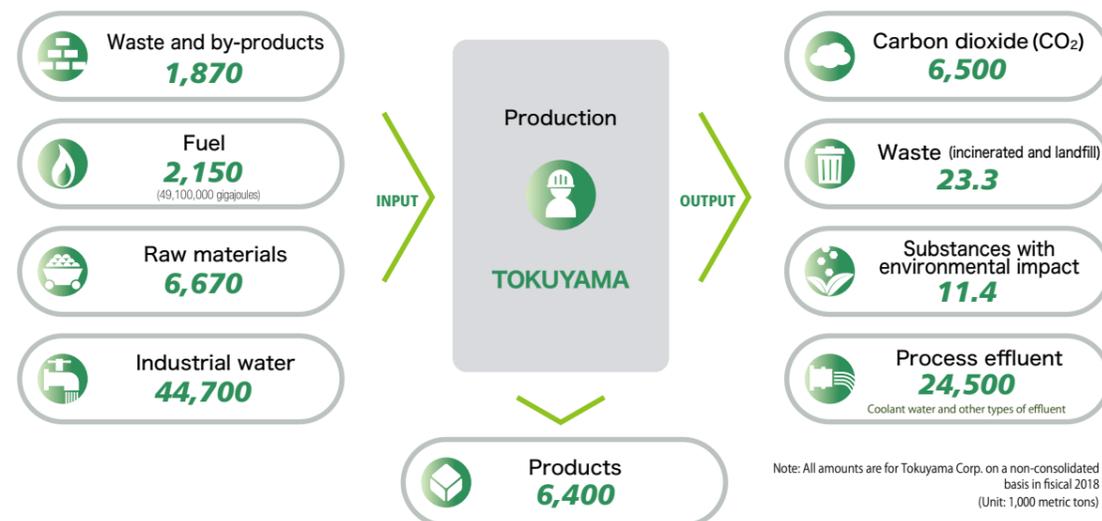
Environmental Costs

Major environmental investment projects in fiscal 2018 included comprehensive drainage measures and establishment of waste storehouses.

Economic Benefits of Environmental Management

In fiscal 2018, the economic benefits remained flat year on year, at approximately 1.4 billion yen.

Flow of Materials in Business Activities



Company-Wide Environmental Management Policy

Medium-Term Basic Policy	Focus Items in Fiscal 2019
<p>Tokuyama actively undertakes environmental preservation and strives to help build a sustainable society, based on its Basic Philosophy of Responsible Care and the following policies.</p> <ul style="list-style-type: none"> Thorough compliance with laws and regulations Zero environmental accidents Reduction of environmental impact Combating climate change Continuous improvements to environmental management systems Improved relationship of trust with stakeholders 	<ul style="list-style-type: none"> Strictly comply with legal requirements, etc. Continue zero environmental accidents Reduce environmental impact <ul style="list-style-type: none"> Maintain or reduce emission levels of environmentally hazardous substances Promote zero waste emissions Combat climate change <ul style="list-style-type: none"> Promote energy-saving and conservation of electricity Conduct actions for GHG medium-term reduction goals Expand communication with stakeholders and improve information disclosure

Results of Environmental Protection Initiatives by the Tokuyama Factory in Fiscal 2018

Degree of target achievement: Achieved (A) Not achieved (B)

Category	Items	FY2018 Target	FY2018 Result	Rating	FY2019 Target	
Environmental Impact Reduction	Atmosphere	Soot	-27%	-	Maintain the current low-impact situation*	
	Water Quality	COD	+7%	-		
		Nitrogen	-8%	-		
		Phosphorus	+10%	-		
	PRTR	PRTR	+16%	-		
Global Environment Conservation	Energy Conservation	Energy consumption on a per-unit basis	3% reduction of per-unit energy consumption by fiscal 2020 compared to fiscal 2005	-8.8%	A	Improved per-unit energy consumption
Waste Reduction	Recycling	Effective utilization rate	Maintain at 92%	93.1%	A	Maintain at 92%
	Zero emissions	Zero emissions to landfills	Maintain 99.9% reuse/recycling rate	99.9%	A	Maintain 99.9% reuse/recycling rate

*Regarding performance data, Tokuyama has set a separate numerical management target for each department to maintain the current low-impact situation. The table above does not include specific numerical targets on atmosphere, water quality and PRTR for Tokuyama as a whole. Instead, the year-on-year difference from FY2017 results is shown.

Fiscal 2018 Environmental Preservation Costs

Category	Major Activities	Amount Invested (million yen)	Costs (million yen)	
Costs in Business Areas	Pollution Control	Implementation of comprehensive drainage measures, update of soot and smoke removal equipment, etc.	293	4,539
	Global Environmental Conservation	Adoption of a fuel reduction system, installation and upgrade of equipment for reducing CO ₂ , etc.	155	356
	Resource Recycling	Installation of waste storehouses, partial upgrade of incineration equipment, PCB waste disposal costs, etc.	266	1,244
Upstream and Downstream Costs		0	2	
Management Activity Costs	Installation and upgrade of equipment for environmental monitoring and analysis	12	266	
Research and Development Costs		4	0	
Social Activity Costs	Greenification and beautification measures Production of CSR report	0	68	
Costs for Environmental Damage	Imposition, management of a former mining site	0.3	103	
Total		731	6,578	

Economic Benefits in Fiscal 2018

Category	Material Benefit (1,000 metric tons)	Economic Benefit (million yen)
Gains on Reduction in Energy Consumption	-	191
Gains on Sale of Valuable Waste	91	270
Gains on Reduction in Waste Disposal Costs through Waste Recycling	212	555
Gains on Reduction in Raw Material and Fuel Costs through Waste Recycling	213	385
Total	-	1,401

Learn about Tokuyama's business activities and their impact on biodiversity at:
<https://www.tokuyama.co.jp/eng/csr/>

Helping to Fight Global Warming

Global warming is a critical issue and Tokuyama is helping to mitigate it by conserving energy used in its business activities, developing and manufacturing products that help to reduce GHG emissions and managing Scope 3 emissions.



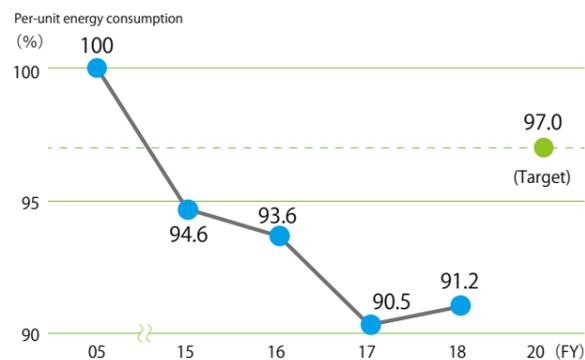
Material issue: **Helping to fight global warming**

Promoting Energy Conservation

Tokuyama consumes a vast amount of energy to manufacture its core products such as caustic soda, cement, and polycrystalline silicon. It also emits carbon dioxide (CO₂), one of the greenhouse gases, primarily in its burning of fossil fuels and decarboxylation of limestone, which is used as a raw material for cement production.

The Company is working to reduce CO₂ emissions by implementing energy conservation measures, including upgrading to more energy-efficient equipment. The Tokuyama Factory accounts for more than 99% of the Company's total energy consumption, and it has a target of reducing its per-unit energy consumption by 3.0% by fiscal 2020, from 2005 levels. The factory has also launched a project to improve per-unit energy consumption, in order to reduce CO₂ emissions even further.

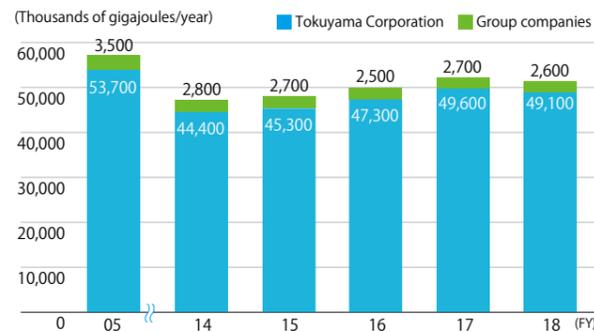
Unit Energy Consumption Index*



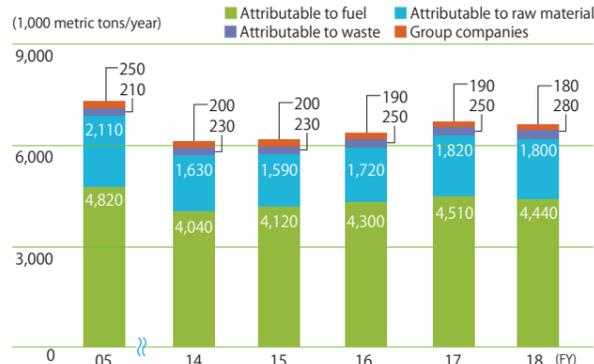
* The unit energy consumption index is calculated using a method recommended by the Japan Chemical Industry Association (JCIA).

In fiscal 2018, the energy consumption rate decreased by 8.8% compared with fiscal 2005 levels, due to utilization of non-coal energy sources and energy conservation measures in addition to lower operating rates at some plants.

Energy Consumption



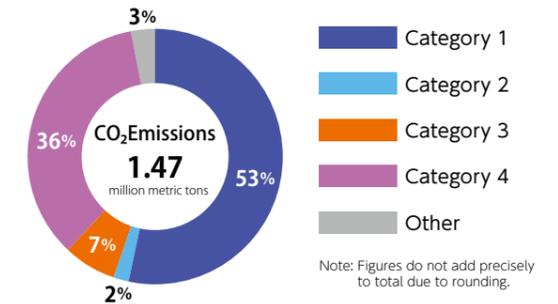
CO₂ Emissions



Calculating and Managing Supply Chain Emissions

Companies today are increasingly required to track and manage emissions not only at their own operations but also at each stage of their supply chains in order to reduce emissions throughout the supply chain. These efforts encompass upstream emissions from the manufacturing and transport of raw materials and products, through downstream emissions from the distribution, use, and disposal of products sold by Tokuyama.

Based on the Scope 3 standard of the GHG Protocol,* Tokuyama is calculating supply chain emissions for category one through seven and category nine emissions under Scope 3. The emissions from these categories were calculated at 1.47 million metric tons, approximately 90% of which belonged to category one (53%) and category four (36%) emissions.



Note: Figures do not add precisely to total due to rounding.

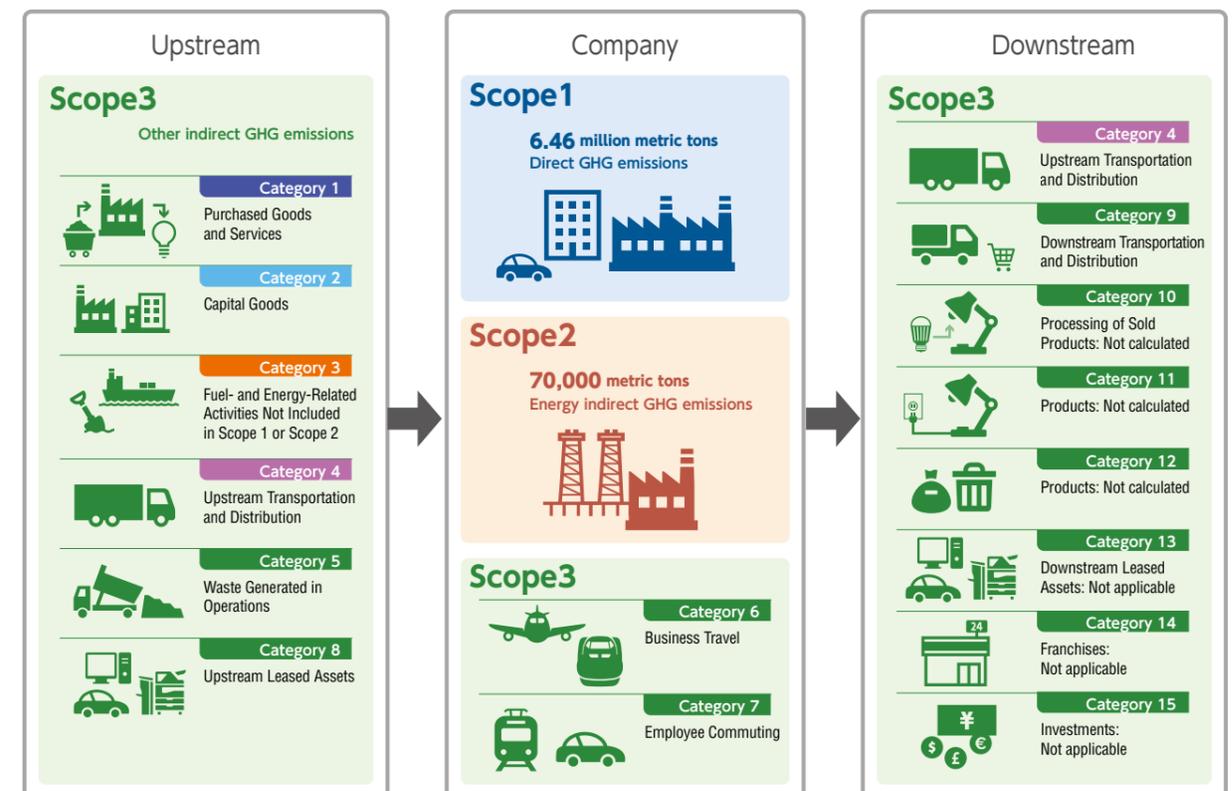
Guidelines: Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain (Ver. 2.3), December 2017, Ministry of the Environment and Ministry of Economy, Trade and Industry, Government of Japan

CO₂ Emissions Unit Database: Emissions Unit Value Database for Calculating Greenhouse Gas Emissions, etc., by Organizations Throughout the Supply Chain (Ver. 2.6), March 2019; Carbon Footprint System Pilot Project: Provisional Common Database of CO₂ Equivalent Emission Factors (Ver. 2.01)

Note: Emissions were calculated for the top 10 raw materials by purchase amount.

* The Greenhouse Gas Protocol (GHG Protocol) was jointly formulated by the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), and the Scope 3 Standard was issued in November 2011 as a standard for calculating CO₂ emissions throughout supply chains.

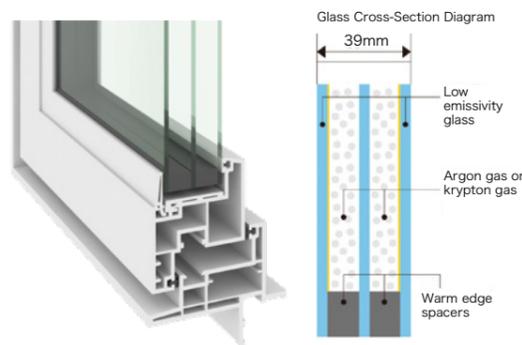
Supply Chain and Scope 3 Categories



Reducing Environmental Impact with Life-Cycle Assessment

Tokuyama conducts life-cycle assessments (LCAs) and reflects the insights gained in its product development and manufacturing to reduce CO₂ emissions and other environmental impacts.

Shanon Window High-Performance PVC Windows



High-performance polyvinyl chloride (PVC) windows outperform traditional aluminum windows for airtightness and thermal insulating performance, enabling significant reductions in CO₂ emissions by reducing electricity consumption from A/C units. It has been calculated that 2.18 million metric tons of CO₂ emissions* could be saved every year if all existing aluminum double-paned windows in Japanese single-unit dwellings were to be replaced with Shanon Window triple-paned vinyl windows.

* Calculated by Excel Shanon Corporation using the housing model from the Design Guideline for Low Energy Houses with Validated Effectiveness 6.1.3 (issued by the Building Research Institute, Japan) and AE-Sim/Heat thermal environment simulation software (developed by Architecture Environment Solutions K.K.).

Life-Cycle Assessment of Portland Cement

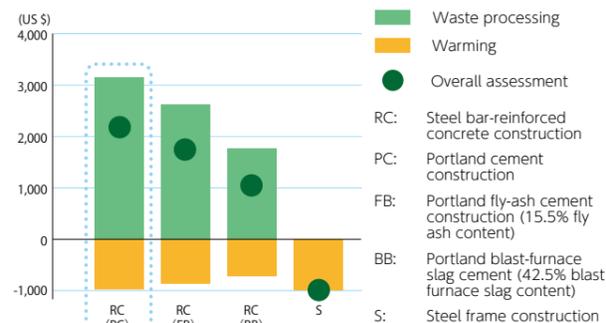
Although cement manufacturing generates significant CO₂ emissions, it also contributes to environmental conservation by co-processing large volumes of difficult-to-recycle waste and byproducts such as excavated soil from construction projects, ash from incinerating urban waste, and sewer sludge.

Environmental impact assessments of the cement business have typically been skewed toward global warming impacts, without properly taking into account the environmental contribution of co-processing. Tokuyama conducted joint research with Hiroshima

University and Taiheiyo Cement Corporation on the environmental impacts of a bridge structure when constructed with different materials, using a new waste index. After calculating the contribution to and impact on the environment, the overall assessment revealed that common Portland cement provided a larger net contribution to the environment than did other cements. The joint research was published under the title "Life Cycle Assessment of Cement in Various Environmental Aspects" and received an award from the 15th LCA Japan Forum Commendation.

Tokuyama will continue to actively develop and manufacture products that contribute to the environment, while striving to reduce GHG emissions throughout the life cycle of its products, from manufacturing to use and disposal.

Life Cycle Assessment of Cement in Various Environmental Aspects



Integrated evaluations are a method for comprehensively assessing various environmental impacts and converting them to economic value as a common indicator.

Life cycle assessments (LCAs) are a method for quantifying environmental impacts throughout the life cycle of products and services (from resource extraction through raw materials production, product manufacturing, distribution/consumption, and disposal/recycling) or at specific stages of the life cycle.

Award from 15th LCA Japan Forum Commendation



Strengthening Chemical Management

Tokuyama continues to strengthen its chemical management by assessing each process for the hazard level and toxicity of chemical substances in products, ensuring compliance with the laws and regulations in and outside of Japan, and conducting risk assessments.



Material issue: **Managing chemical substances**

Product Assessments

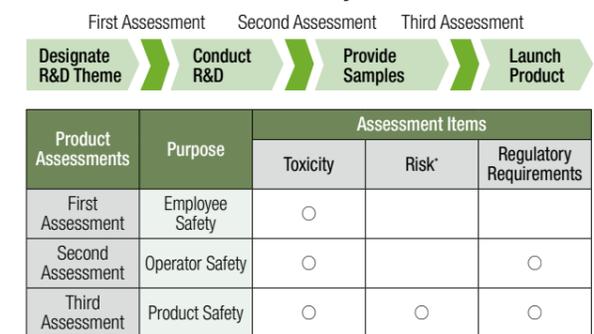
Tokuyama confirms product safety at each stage of operations, from the initial research and development stage through to market release. The assessments confirm compliance with legal requirements and evaluate the level of various risks, including the safety of chemical substances used in the product, their potential impact on the environment, and their effect on human health.

Labelling Assessments

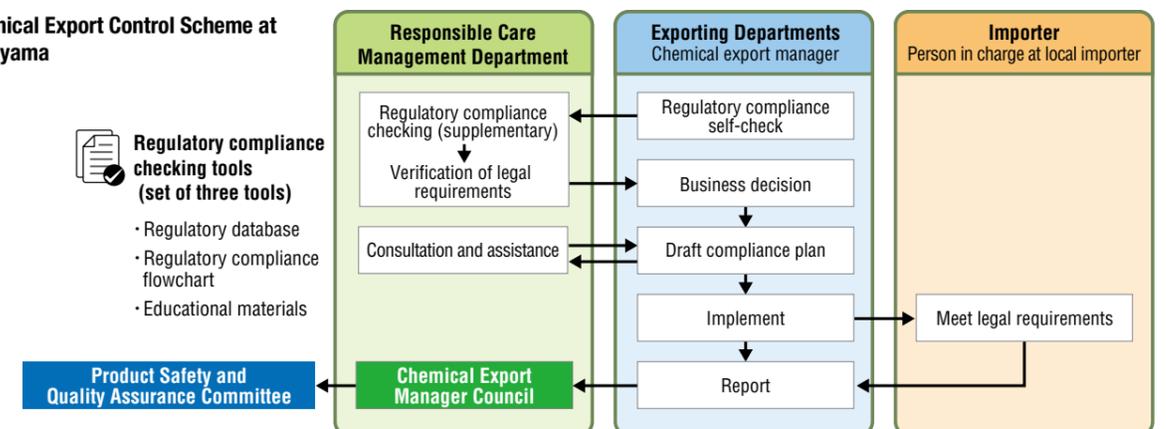
Labelling assessments are conducted to eliminate deficiencies or improper wording in instructions or warnings contained in labelling and documentation such as catalogs, instruction sheets, and safety data sheets (SDS).*

*A safety data sheet is a document for recording information related to the risks and toxicity of chemical substances. It is prepared to facilitate the safe handling of such substances, and includes the names of the substances, safety measures, and procedures for responding to emergencies.

Overview of Product Assessment System



Chemical Export Control Scheme at Tokuyama



Reducing Substances with Environmental Impact and Waste

Tokuyama is continually working to reduce its emissions of air and water pollutants and implementing environmental conservation initiatives such as waste recycling.



Material issue: **Conserving the environment**

Reducing Water and Air Pollutants

Amounts of Atmospheric Emissions

In order to reduce atmospheric pollution from sulfur oxides (SOx), nitrogen oxides (NOx), and soot, Tokuyama equips boilers, cement kilns, and other pollutant-generating facilities with flue gas desulfurizers, denitration equipment, low-NOx burners, and high-performance dust collectors. In fiscal 2018, SOx and NOx emissions remained the same as the previous year, and soot emissions decreased due to facilities and operational management improvements.

Emissions of Pollutant Release and Transfer Register (PRTR*) Substances

The substances handled in fiscal 2018 included 25 substances that must be registered under Japan's Pollutant Release and Transfer Register (PRTR) law. Non-consolidated emissions of PRTR substances increased slightly in fiscal 2018 due to production increases. Emissions by Group subsidiaries decreased due to reduced production at some companies.

* The PRTR system collects and publishes data on the sources of designated harmful chemical substances and the amounts of these substances discharged in the environment or transported from production sites as part of waste matter.

Amounts of Hazardous Air Pollutant Emissions

Tokuyama generates chloroethylene and three other substances that are subject to voluntary controls under Japan's Air Pollution Control Act. The Company has formulated a voluntary action plan and is working to reduce emissions of these substances.

Amounts of Industrial Effluent and Wastewater

The Tokuyama Factory follows a stringent system for monitoring industrial effluent and purifying wastewater using treatment equipment in order to comply with regulatory standards and limits set by

the local government, as well as the Company's own standards, which are even stricter. The factory also employs activated sludge treatment facilities for reducing the discharge of nitrogen and phosphorous and meeting chemical oxygen demand (COD)* regulations for overall water quality. In fiscal 2018, COD and phosphorus emissions remained flat year on year, while nitrogen emissions slightly decreased.

* Chemical oxygen demand is an indicator used to measure water quality, and refers to the amount of oxygen required to oxidize organic compounds in water.

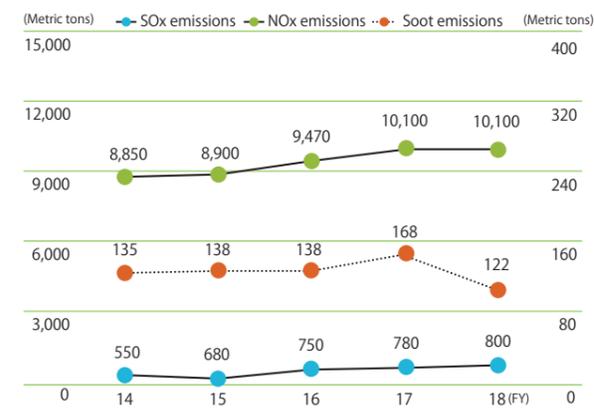
Reducing Waste and Managing Waste Recycling

The effective utilization rate for waste and the "zero emissions" rate remained high in fiscal 2018, due to efforts to reduce the volume of waste and comprehensive recycling efforts.

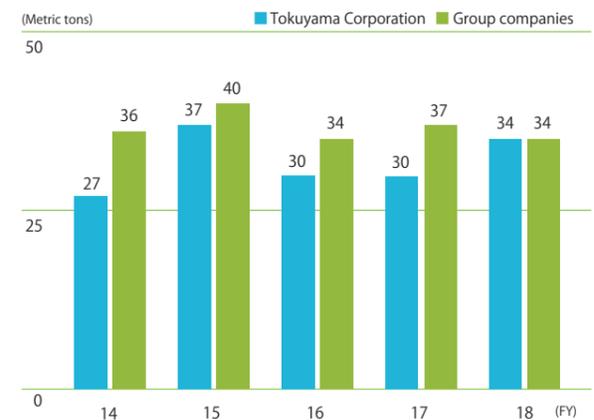
Waste Management

Tokuyama generated a total of 339,000 metric tons of waste in fiscal 2018. It actively worked to recycle this waste both in and outside the Company, mainly by re-using waste matter as raw materials and fuel for cement at the Tokuyama Factory. Through its diligent efforts to recycle waste as raw material for cement, Tokuyama achieved an effective utilization rate of 93.1%. The Company also made progress with reusing waste and reducing the amount generated, and achieved its landfill waste "zero emissions" target of 99.9% for the sixth consecutive year.

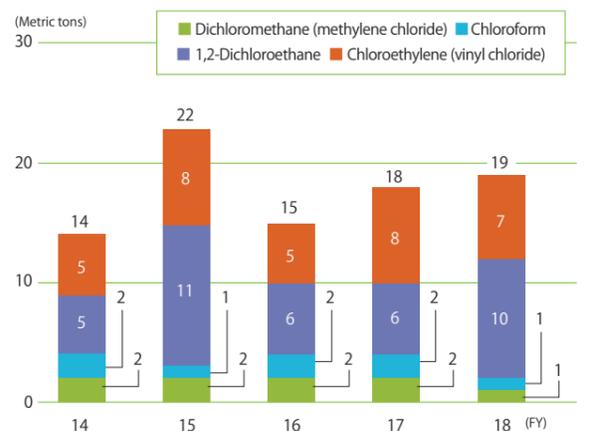
Emissions of SOx, NOx, and Soot



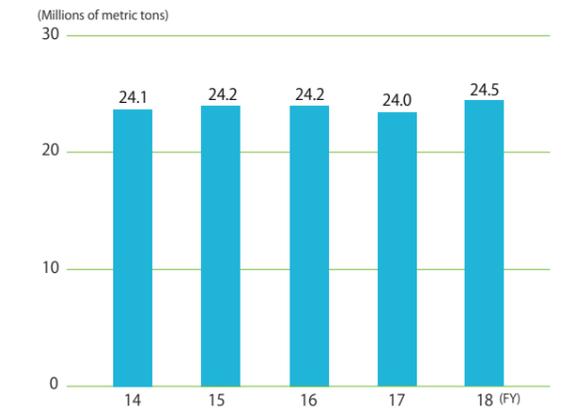
Emissions of PRTR Substances



Emissions of Hazardous Air Pollutants



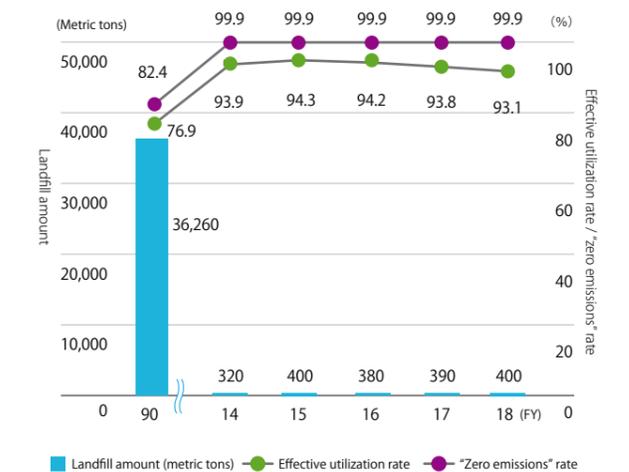
Discharge of Industrial Effluent



Water Pollutant Emissions

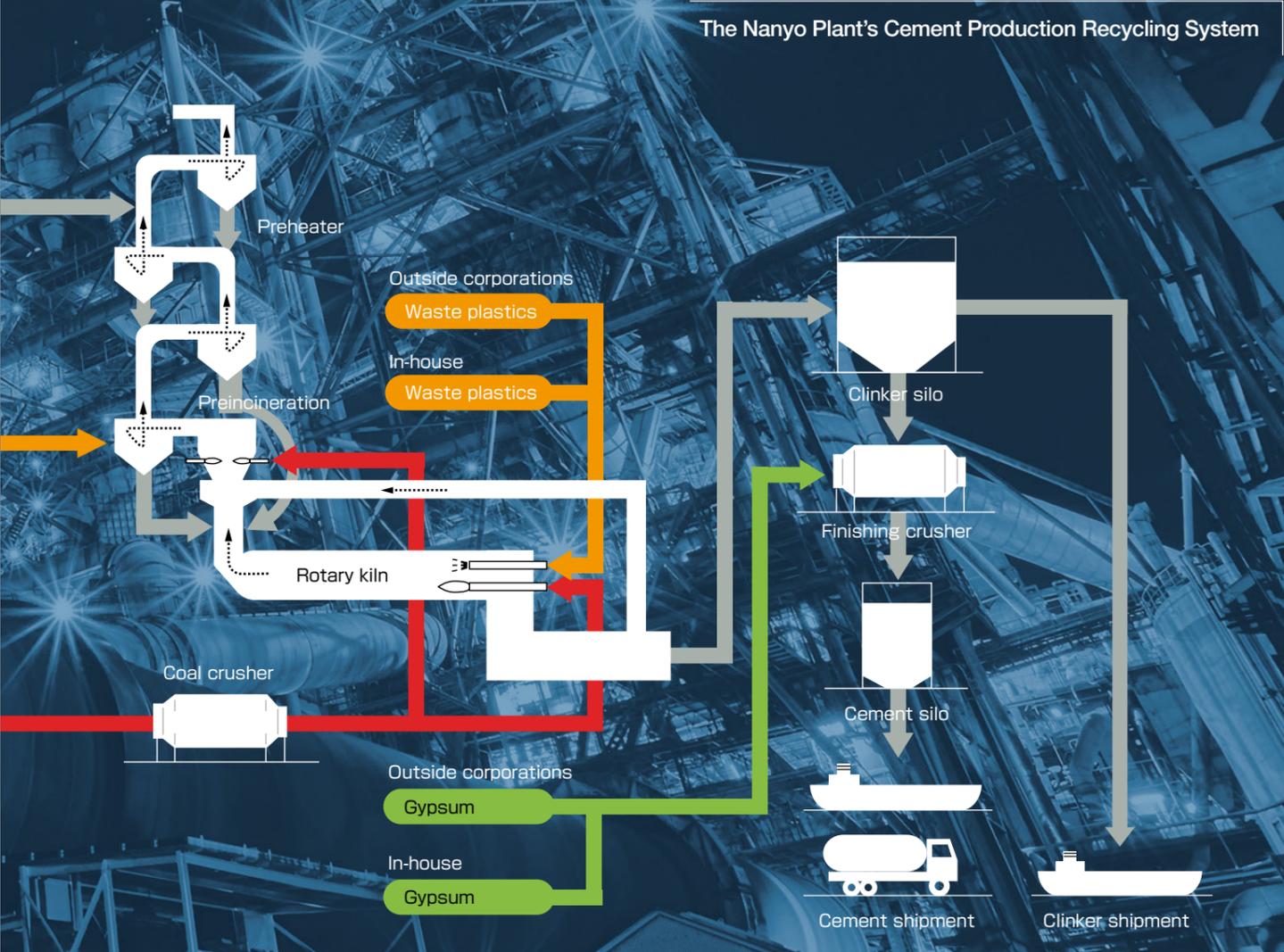
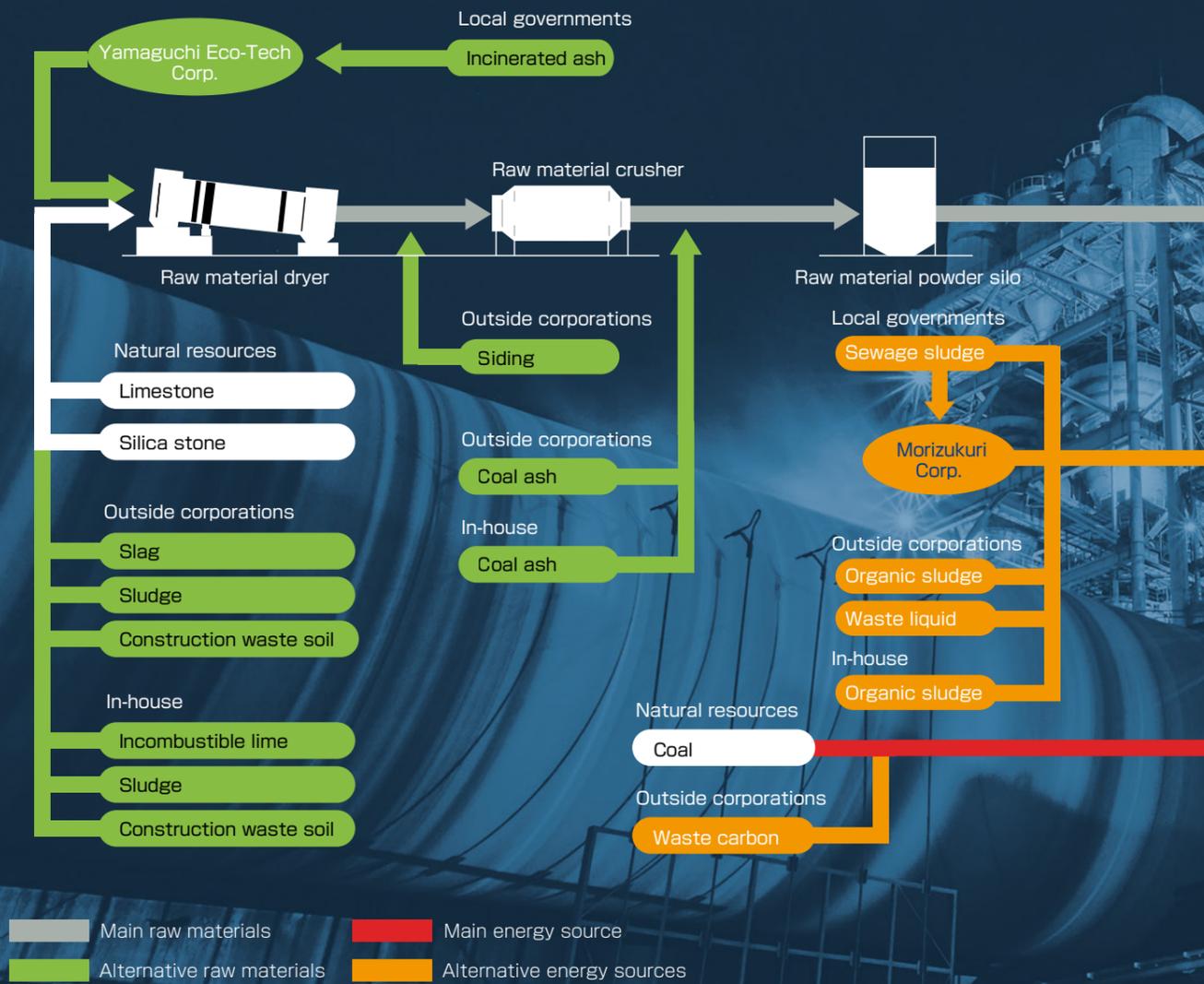
	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
COD Emissions	112	126	116	121	129
Nitrogen	89	92	145	173	159
Phosphorus	2.6	2.2	2.1	2.1	2.3

Landfilled and Recycled Waste



$$\text{Effective utilization rate (\%)} = \frac{\text{Amount of waste recycled (in-house and externally)}}{\text{Total waste generated}} \times 100$$

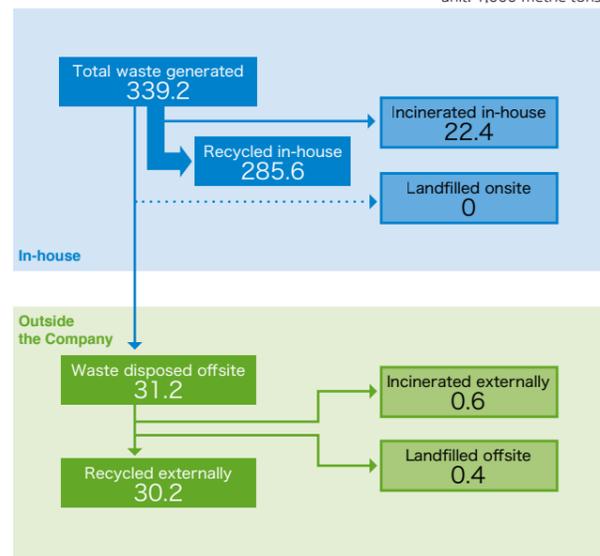
$$\text{"Zero emissions" rate (\%)} = \left[1 - \frac{\text{Amount of landfilled waste (onsite and offsite)}}{\text{Total waste generated}} \right] \times 100$$



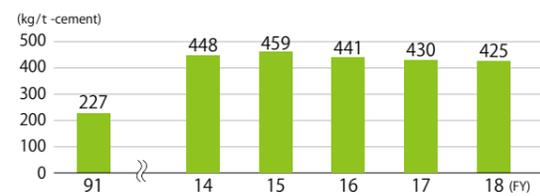
Clinker: A compound mass made by firing raw materials at high temperatures. This is mixed with gypsum and crushed to make cement.

Flow of Industrial Waste Treatment

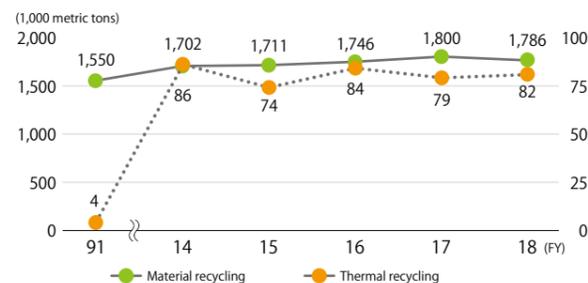
unit: 1,000 metric tons



Shifts in Units of Waste Matter/ By-Products Used Per Metric Ton of Cement



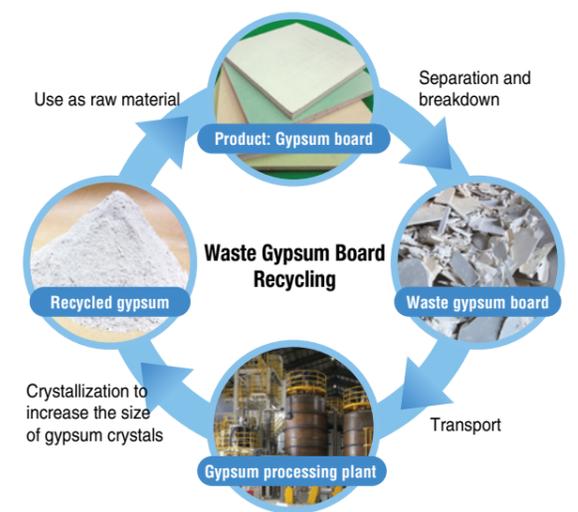
Utilization of Waste Matter at Cement Plants (Material Recycling/Thermal Recycling)



Technology for 100% Recycling of Waste Gypsum Board Cited for Minister of Environment Award

Tokuyama and its group company Tokuyama Chiyoda Gypsum Co., Ltd. have developed a recrystallization technology that enables 100% recycling of waste gypsum board. This achievement earned the companies a Minister of Environment Award under the 46th environment awards of the Ministry of the Environment.

Gypsum board is used in the interior walls and ceilings of buildings and generates waste during construction, renovation, and demolishing. Only around 10% of this waste gypsum board is typically processed into recycled content for new gypsum boards, with the majority ending up in landfills. The new technology achieves the world's first 100% board-to-board recycling of waste gypsum board.



Accident Prevention and Occupational Health and Safety

Recognizing that safety is the basis for its business activities, Tokuyama practices safety as the first step to maintaining good relations with the communities in which it operates. Based on this approach, the Company carries out stringent accident prevention measures and occupational health and safety initiatives in its efforts to create a positive and safe work environment that is free of accidents.



Material issue: Preventing accidents and preparing for disasters

Comprehensive Safety and Accident-Prevention Measures

Tokuyama has adopted three principles for ensuring safety: fulfill the obligations of a good corporate citizen, give safety priority over all business activities, and ensure that everyone is aware of their responsibilities and acts accordingly. Based on the safety management system of the Tokuyama Factory, the Company works to identify and eliminate hazards by assessing risks in work, facilities and processes. Tokuyama also strives to stop unsafe behavior by conducting studies into behavioral characteristics. As part of occupational health and safety activities,

worksites carry out basic safety activities, including safety patrol, *kiken yochi* hazard prediction, and near-miss activities.

Disaster Preparedness Drills

Tokuyama has carried out various training activities. These include disaster drills for pipe leaks and fires caused by an earthquake, emergency drills at individual company divisions, joint drills involving affiliated companies and contractors, and workplace safety competitions. The Company has also conducted drills for initiating its business continuity plan (BCP) in the scenario of a Tokyo inland earthquake by designating

the Tokyo Head Office as the disaster response headquarters and the Tokuyama Factory as the crisis response headquarters.

Helping Contractors Promote Health and Safety

Tokuyama and its contractors carry out the following initiatives to promote health and safety: (1) joint safety meetings for safety education and information sharing on situations on the production floor; (2) safety patrols to ensure safe construction work and to improve unsafe situations; (3) supervisory skills training, and hazard simulation training to improve risk handling techniques; and (4) checking and improving operating procedure documentation.

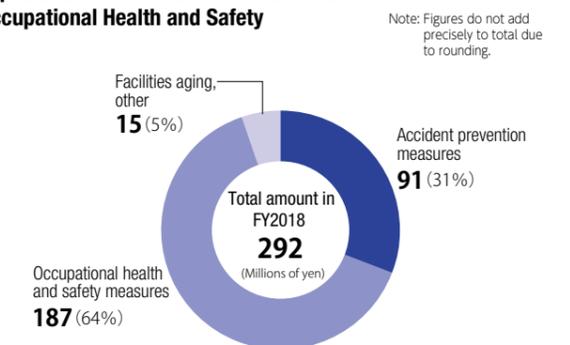
Promoting Sound Physical and Mental Health

To raise health awareness among employees, Tokuyama encourages its employees to take part in the Smart Life Program, where they set, manage, and assess progress on their own monthly weight goals, etc. Tokuyama is also working to reduce the rate of work absences by offering health improvement counseling based on medical checkups. As for mental health, the Company is practicing early intervention, including carrying out diagnostic surveys of work-related stress for all employees and offering internal or third-party consultation services.



General disaster preparedness drill

Expenditures for Accident Prevention and Occupational Health and Safety



Fiscal 2019 Company-Wide Safety Management Policy

Tokuyama operates a safety management policy and actively implements safety initiatives as a good corporate citizen.

- Implement safety initiatives involving all employees, under the leadership of upper management.
- Comply with laws, regulations, and internal rules.
- Foster and enhance a culture of safety, for the safety of people, facilities, and the public.
- Create comfortable workplaces to ensure the mental and physical health of the people who work there.

Fiscal 2019 Tokuyama Safety Management Objectives and Key Action Items

Policy Objectives

- No compliance violations ■ No accidents or disasters
- Reduce the rate of work absences

Improve process safety management

Improve hazard awareness, expand and comprehensively implement change management, expand and comprehensively implement hazard prediction activities, utilize IoT and big data

Identify sources of risks and resolve

Conduct risk assessments for irregular operations, respond to risk assessments for chemical substances

Make progress in risk management and hazard management

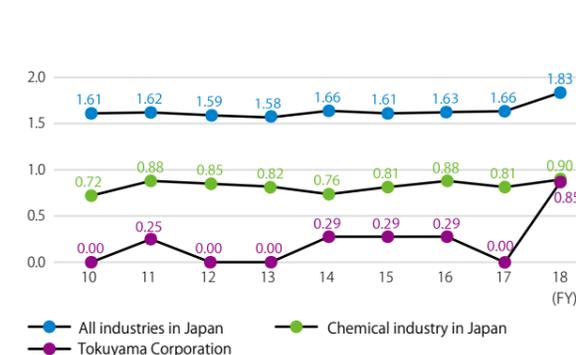
Prepare for response to a potential major earthquake

Promote facilities management

Enhance management of older facilities, expand efforts to identify facilities risks

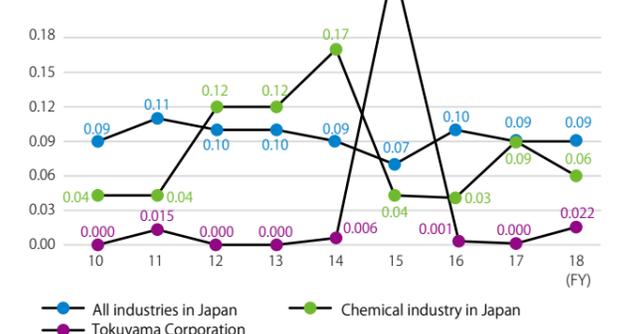
Promote physical and mental health

Comparison of Accident Frequency Rates*1



*1 As an indicator of the frequency of industrial accidents, the accident frequency rate is calculated as the number of workers forced to miss work due to an industrial accident per one million cumulative working hours.

Comparison of Accident Severity Rates*2



*2 As an indicator of the magnitude of industrial accidents that have occurred, the accident severity rate is calculated as the number of lost work days due to industrial accidents per 1,000 cumulative working hours.

Innovative Dental Materials and Devices for Health and Longevity

The Tokuyama Group provides products that help solve social issues. In the field of dental materials and devices, Tokuyama Dental Corporation, a group company, produces innovative products that contribute to prolonging a healthy life span.



Material issue: **Developing products and technologies that help solve social issues**

40 Years in the Dental Materials and Devices Business

Tokuyama entered the dental market in 1978 in a joint venture established by Tokuyama Soda Co., Ltd. and Wada Precision Dental Laboratories Co., Ltd. in order to expand beyond the material industry and create new businesses. The new company focused on dental ceramics such as implant materials that can utilize inorganic chemical technology and moved into dental product areas. The joint venture was merged into Tokuyama Dental in 2001 and, in March 2018, Tokuyama celebrated its 40th anniversary in the market for dental materials and devices.

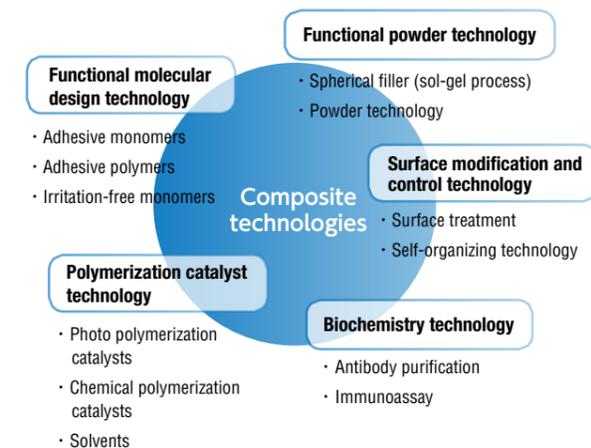
Combining Diverse Technologies to Create World Firsts

Tokuyama Dental's Tsukuba Research Laboratory is developing unique, world-leading products by combining technologies it has fostered, such as functional powder technology, molecular design technology, polymerization catalyst technology, surface modification and control technology, and biochemistry. In research and development, the ability to utilize the Group's wide variety of technologies is a strength,

and cooperation with R&D in different fields such as the environment, energy and ICT has become a springboard for new technologies. For example, the key technology of photo polymerization was developed and improved based on the catalyst technology developed at Tokuyama.

R&D requires expensive analytical equipment and advanced technology. Tokuyama Dental has a major advantage in having access to the equipment and talented employees of Tokuyama's Analytical Science Department.

Key Technologies in Tokuyama Dental



Voice))

Extending the Healthy life span by Contributing to Dental Health

Our business got its start 40 years ago in a single laboratory entrusted with the dream of developing new businesses for Tokuyama. Using the power

Makoto Sakamoto

President
Tokuyama Dental Corporation



of chemistry to create original products that make people all over the world smile, we aim to be a company that provides dental systems that are truly appreciated by customers.

Moving forward, we will supply products that support the growth of preventive dentistry to extend healthy life span, and address needs for cosmetic dentistry and digitization in the dental field. Our dental materials and devices are currently sold in about 70 countries and regions, and we have received two Top Product Awards for consecutive years from a U.S. dental advisory body. We will enhance our presence in the U.S., Europe and around the world, thereby contributing to dental health and helping people live healthier, longer.

Estelite Sigma Quick



Estelite Sigma Quick—Selected Top Universal Composite for 10 years in a row by The Dental Advisor Top Product Awards

Sofreliner Tough S



Sofreliner Tough S—Selected Top Denture Reline Material for six years in a row by The Dental Advisor Top Product Awards

Kashima Factory—Production Technology Designed to Deliver Original Products

The majority of Tokuyama Dental products are manufactured at the Kashima Factory in Ibaraki Prefecture. These include supra-nano spherical fillers, a fundamental material used in resin composite (CR) for treating dental cavities. This material offers both gloss retention and strength, sustaining the gloss of the applied area while being resistant to external coloring and wear. The Kashima Factory employs advanced synthesis technology to manufacture uniform sized spherical fillers that are comprised of microscopic particles with an average size of 0.2 micrometers.

In order to ensure patient safety, the factory conducts manufacturing and quality control based on the ISO13485 quality management system. This includes implementing raw material acceptance and product specification tests, assuring that products are safe and secure. Since 1999, the Kashima Factory has also employed ISO14001-certified environmental management systems to reduce its environmental impact, including waste reduction and energy conservation.

Meeting the Needs of Dentists with Detailed Sales Activities

Tokuyama Dental sells its products to dentists through dealers. By providing feedback to the R&D department on the needs in dental clinical practice from dentist, dental technicians, and so on collected by the sales staff, the company has been able to develop products that meet the needs of its customers. The sales department is also building up the company's reputation in the dental care market by establishing relationships with leading doctors and following up with study groups.

Dental disease such as cavities and periodontal disease can affect a person's diet and social life, and impact their overall health. Maintaining dental and oral health is essential to living life to the fullest. Tokuyama Dental brings together the strengths of its R&D, manufacturing, and sales departments to provide innovative dental materials and devices.



and finished. Since teeth come in many shades, dentists must stock various colors of composites to match surrounding tooth colors. Tokuyama Dental has achieved a major advancement in composite technology with the development of OMUNICHROMA, the world's first dental restorative material that matches every tooth shade with a single composite shade. Released in the U.S. in February 2019 and in Europe in March, OMUNICHROMA has created a stir as a groundbreaking solution for dentists.

One Shade to Match All Patients —A Groundbreaking Solution

Tooth decay is normally removed by drilling, and the cavity is then filled with CR, which is in turn light-cured



World's First Smart Chromatic Technology

In order to color match the unique shade of a patient's teeth, dentists using conventional CR must maintain an inventory of shades, and in the case of cosmetic dentistry, they must stock dozens. Tokuyama Dental's CR product realizes a chameleon (shade-matching) effect by employing proprietary supra-nano spherical fillers, enabling a broad range of tooth colors to be matched with fewer shades. OMUNICHROMA with Smart Chromatic Technology takes this a step further by using a single composite shade to match almost any tooth.



Voice)))

Dr. Peter Auster

Dentist in Pomona, New York

OMUNICHROMA is groundbreaking —a win-win for all offices. No need to stock 30 composite shades that expire and take up space. So economical and it works great!



Benefits of OMUNICHROMA's Smart Chromatic Technology

Fill a cavity with OMUNICHROMA and once it is light-cured and finished, the filled area becomes the color of the surrounding tooth. OMUNICHROMA is the world's first CR that matches the shade of the surrounding dentition. The red-to-yellow color generated by the spherical fillers combines with the reflected color of the patient's surrounding dentition, creating the perfect match.

A Breakthrough Product Born of Serendipity

The secret to Smart Chromatic Technology lies in the physical phenomenon of structural color, which develops according to the structure of an object. The breakthrough came during the development of a new CR filler, when a prototype displayed undesired shades. Researchers realized the failure was caused by the effects of structural color, leading them to study the mechanism as an adjunct to their primary research. After overcoming a number of obstacles to commercialization, OMUNICHROMA was born.

Proprietary Supra-Nano Spherical Filler

The filler material used as CR's main component is crucial to the realization of OMUNICHROMA. While conventional fillers are made from rough, unevenly ground particles, OMUNICHROMA's supra-nano spherical fillers are manufactured using a sol-gel method that produces microscopic, uniformly sized spherical particles from molecules. CR made from this filler is already highly regarded for its superior polishability, wear resistance, mechanical strength, and esthetic properties. Tokuyama Dental applied this technology to structural color and advanced it to create a new color-adaptation technology, resulting in OMUNICHROMA, a CR superior to other brands using ground particle fillers.



Improving Development by Encouraging Young Researchers to Lead Research Themes

Voice)))

Kouichiro Hirata

General Manager
Tsukuba Research Laboratory
Tokuyama Dental Corporation

Integration of development, manufacturing, and sales is our company's strength and enables us to develop innovative, world-leading products. In 2018, Tokuyama Dental filed 45 patents, evidence of our strong emphasis on patent filings.

To encourage the development of new products, the Tsukuba Research Laboratory allows researchers to devote roughly 10% of their time to non-primary development themes without set goals. This encourages spontaneous ideas and

enables teams to incorporate new insights freely. The environment empowers young researchers to display their abilities as theme leaders and gain experience by pursuing development to the stage where they get feedback from dentists, and this, in turn, fosters their marketing skills.

Aging demographics and digitization are two issues that need to be addressed in the field of dental care. There is a need to develop products that help extend the healthy life span of elderly persons, and a need to leverage digital technologies to develop products that lead to innovations in dental techniques. We promise to continue working to develop one-of-a-kind products that customers find truly satisfying.

Voice)))

Development of New Shade-Matching Technology for Composite Resins

My co-researcher and I began developing OMUNICHROMA in 2009 while working to develop a CR for cosmetic restoration. During this development process we discovered that the particle size of the spherical filler gave color to the CR. We studied this phenomenon as a development sub-theme, thinking that there must be an application for the ability to take on various colors. Eventually, we developed a CR that generates red-to-yellow structural color and verified its broad shade-matching performance by filling artificial teeth of different colors. That was the moment that led to our breakthrough.

Dental restoration using CR is performed on a cavity that is formed after tooth decay is

Hironobu Akizumi

Manager
Tsukuba Research Laboratory
Tokuyama Dental Corporation



removed. Both the color of the tooth and cavity shape can vary widely. Using artificial teeth, we demonstrated that our CR could match different shades and cavity shapes. We then initiated full-scale R&D in late 2014 as a main development theme. As in this case, many of our company's breakthrough products have come from development sub-themes, which are fun to work on, pressure-free, and satisfy our curiosity. We will keep working to develop products that are embraced by dentists and patients.

Developing Talent and Promoting Diversity

While pursuing the four values stated in the Tokuyama Vision, the Company is working hard to develop talent and promoting diversity. Tokuyama wants every employee to make the most of their unique gifts and abilities.



Material issue: **Developing human resources; emphasizing diversity**

Tokuyama Human Resource Development

Tokuyama's human resource development system focuses on helping employees improve their abilities and interpersonal skills as free-thinking individuals. The goal is to develop high-quality human resources capable of taking the initiative and exercising creativity.

Global Training

The Company carries out various types of training to develop the human resources needed to drive its global business activities. It provides English and Chinese business communication programs that include training in language and intercultural communication skills. Experts from outside of the Company are also invited to provide lectures.

Next-Generation Business Leader Training

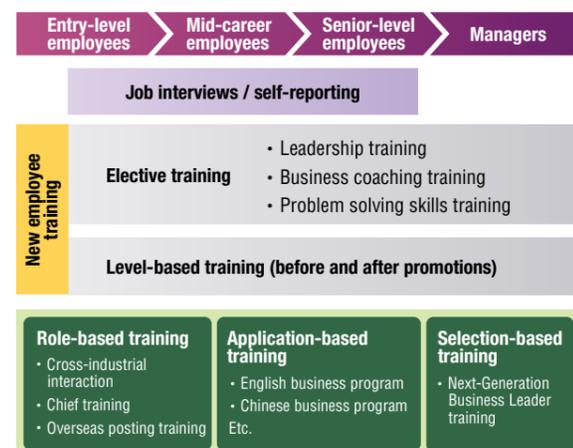
Next-Generation Business Leader (NBL) training started in fiscal 2018. The goal of the training is to

develop prospective managerial talent from early in their careers to lead the Company in the future. The training aims to equip future leaders with a detailed understanding of the Company and business structures. It fosters inspiration and insight, and promotes the mindset and skills it takes to envision future businesses, make decisions and courageously execute new business models.

Personnel System Reform

Tokuyama is reforming its personnel system to increase the work satisfaction of employees. The aim is to change the organizational culture by encouraging adoption of the Tokuyama Vision (see page 3), while ensuring that all employees receive impartial treatment under a thoroughly applied, fair evaluation system. The personnel system for managers was changed in fiscal 2017, and for senior contract employees in fiscal 2018. The Company is currently reviewing the system for other employees and is working to develop a foundation on which diverse human resources can be successful.

Tokuyama Human Resources Development Program



Tokuyama Employees

		FY2016	FY2017	FY2018
Number of employees	Men	1,716	1,700	1,750
	Women	172	169	170
	Total	1,888	1,869	1,920
Number of new hires	Men	17	18	48
	Women	1	4	7
	Total	18	22	55
Number of rehired individuals	Single year	92	34	26
	Cumulative	192	233	216
Average years of service		20.8	21.1	21.2

(Tokuyama Corporation only)

Tokuyama Corporation Action Plan to Promote Opportunities for Women

Duration: April 1, 2016–March 31, 2020

Target and Strategies	Performance (March 2016)	Performance (April 2019)
Ensure that women account for no less than 20% of all persons with at least a university undergraduate degree who are hired for career-track positions. (3-year moving average) ■ Strengthen recruitment of women among university graduates	2013–2015: 25%	2017–2019: 20%
Ensure that women account by 2020 for no less than 6% of all assistant managers ■ Encourage and support employees to move to management track positions	4.7%	6.1%
Ensure that women account by 2020 for no less than 2% of all managers.*1 ■ Introduce a mentor system for NBL training and promote mid-career recruitment	1.1%	1.6%
Ensure that women by 2020 hold at least 10 sales positions and 20 positions in manufacturing departments. ■ Improve hiring in line with assignment	Sales positions*2: 4 employees All production divisions: 13 employees	Sales positions: 9 employees All production divisions: 15 employees

*1 Including positions equivalent to managerial positions *2 Sales positions include persons externally engaged in direct client services, such as technical sales, quality assurance, etc.

Promoting Diversity

Tokuyama is promoting diversity to ensure that all employees can work with energy and succeed. The Company respects the diversity of its human resources and aims to improve productivity by raising employee awareness, understanding that this leads to improvement in corporate value.

To promote advancement of women in the workforce, Tokuyama has taken various steps to achieve the

four goals in its action plan. The percentage of women in senior and management positions now exceeds the target of 6%, as of April 2019. This was achieved by transitioning women from non-management track positions to management track positions. The Company's first female manager was hired through mid-career recruitment.

Tokuyama is also working to improve workplace environments for people with disabilities, aiming for the legally required employment rate of 2.2%.

Voice)))

Putting More Women in Management Roles Will Transform the Company

Way back when I joined Tokuyama, women were limited to tasks such as preparing documents and serving tea. So I decided to draw up my own job description, and asked my boss to assign the work to me. One of the jobs I proposed for myself was the introduction of a web conferencing system. Since business trips and face-to-face meetings were the norm at that time, many people in the company had negative opinions about web conferencing. Today however, it has become an indispensable tool for in-house communication, allowing us to speak with people easily around the world.

With innovation critical today, we must bring together people of different genders with diverse experiences in order to generate new ideas. That is why women need to play active roles in the company.

It is also critical that we increase the number of women in management positions, but some women are reluctant to take on these roles, fearing that

Misae Aimoto

President
Shunan Swimming Club & ACS

1979: Joined Tokuyama (assigned to Human Resources department)
2006: Assigned to Budget Management Department
2018: Named President, Shunan Swimming Club & ACS



their responsibility would increase. However, being a manager allows you to do more things. Once you are in that position, you can make changes. With more variety in your duties, your work becomes even more enjoyable. Developing women for management is one of my roles, so I am providing support for women at Tokuyama.

The ratio of men to women in Tokuyama's workforce is nine to one, and almost all of the managers are men. It is difficult for women with young children to work in the office. But once the children are grown, they have more time to devote to work. If we can support more women to keep working until their children are older, Tokuyama will change and become a more interesting company.

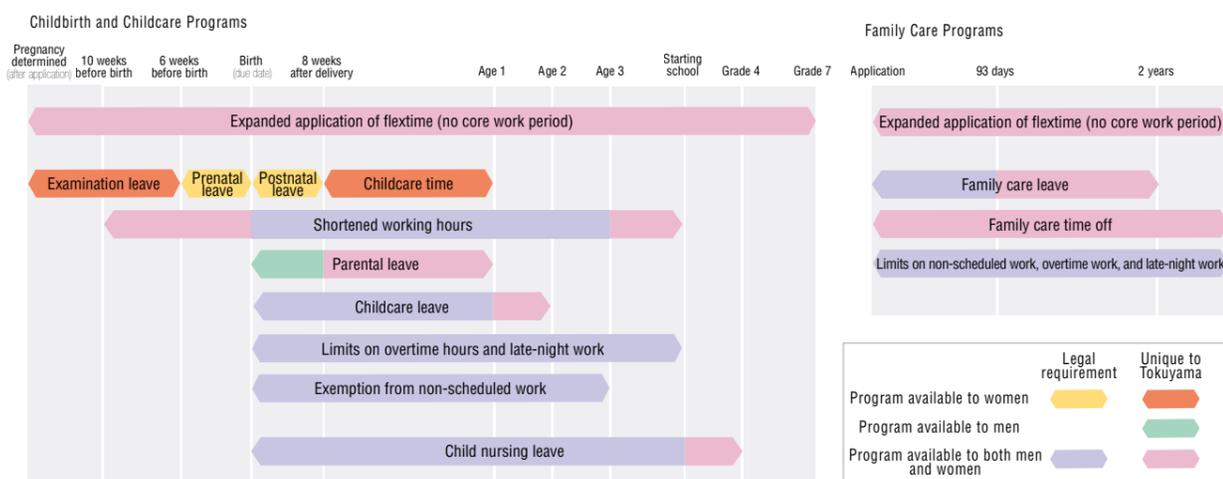
Promoting Work-Life Balance

At Tokuyama, employees in workplaces eligible for flextime can choose their workday schedules with no core work-period requirement. The Company is also striving to optimize working hours by tracking and presenting aggregate data based on the computer log details of employees, enabling actual working conditions to be managed.

Under a program to help employees balance work and childcare responsibilities, shortened working hours can be received from 10 weeks before childbirth until the child starts elementary school. Eligible employees can also use flextime from the time that pregnancy is determined, until the child reaches sixth grade. Starting April 2019, the period during which paid parental leave can be obtained was extended to within one year after child birth. Childcare leave can be obtained until the child reaches age two. The rate of women returning to work after prenatal/postnatal leave and childcare leave in fiscal 2018 remained at 100% from the previous year. In 2019, male employees will be reminded of their eligibility to take childcare leave.

Employees can also take family care leave for up to two years (legal requirement: 93 days in total) for each family member requiring care. With family care time off (unpaid), regardless of the number of care recipients, it is possible to take off two days a week (legal requirement: five days a year). To support those on childcare and family care leave and help them eventually make a smooth transition back to

Support Programs for Childbirth, Childcare and Family Care



Voice)))

Helping Men to Take Advantage of Work-Life Balance Support Programs



Koji Ozawa

Manager
Budget Management Department

Work-life balance is an important initiative for Diversity and Inclusion Management. While there are already many working people with responsibilities such as child and family care, they will become increasingly prevalent as workplace diversity expands. This is why the organizational culture needs to encourage men also to use the work-life balance support programs. Increasing productivity in the workplace, promoting an understanding of diverse work styles, and dispelling notions about gender-based roles are the keys to achieving better work-life balance for employees.

work, internal information is shared with them on the intranet. In addition, an employee reinstatement (re-hiring) system has been established to allow employees who resigned for childcare or family care reasons to be rehired. After the mandatory retirement age of 60, employees can choose to be rehired up to the age of 65 through a senior contract employee system. The current number of senior contract employees is about 170, approximately 7% of all employees.

Annual Paid Leave Usage and Non-scheduled Working Hours

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Annual paid leave, average days used	15.3 days	15.9 days	15.2 days	15.2 days	15.7 days
Annual paid leave, average usage rate	74.3%	76.6%	73.6%	73.2%	75.6%
Non-scheduled working hours average (per month)	5.7 hours	6.3 hours	7.7 hours	8.3 hours	9.8 hours

Usage of Childcare and Family Care Leave, Etc.

*Only for men

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Number of employees taking childcare leave	9	10	13	11	12
Return to work rate	88.9%	90.0%	84.6%	100.0%	100.0%
Number of employees taking parental leave*	13	18	13	25	33
Family care leave-taker	2	1	1	2	2
Number of employees taking family care time off	1	1	1	0	1
Number of Expanded application of	43	52	55	54	50

Work-Life Balance Support Programs

Category	Program	Details
Flextime system		
Employees eligible for flextime can freely select work schedule (no core work period)		
Childbirth and childcare	Flextime eligibility	An employee raising a child in sixth grade or younger, but who is not eligible for flextime, can apply for transfer to a workplace where flextime is available, making the employee eligible for flextime.
	Expanded application of flextime	Employees who are pregnant or raising a child in sixth grade or younger can work shortened hours below the prescribed monthly work hours, and can work intermittently with interruptions and resumption of work.
	Examination leave	A pregnant employee can receive one day paid leave per month as part of leave taken to receive health guidance or medical exams.
	Prenatal and postnatal leave	Paid leave can be taken for up to six weeks before childbirth (14 weeks for a multiple-child pregnancy), and up to eight weeks after childbirth (law only requires unpaid leave).
	Childcare time	A female employee raising a child younger than one year old can take 30 minutes of childcare time twice a day (paid).
	Shortened working hours	An employee expecting a child within 10 weeks or raising a preschool child can shorten the work day by one to two hours per day.
	Parental leave	An employee with a newborn can take three days of paid leave within 14 days of the birth, and five days within one year of the birth, in principle.
	Childcare leave	An employee can take up to two years of leave after the birth of a child.
	Limits on overtime and late-night work	An employee raising a preschooler can apply to limit after-hours and late-night work.
	Exemption from non-scheduled work	An employee raising a child younger than three can apply for exemption from non-scheduled work.
	Reinstatement registration system	An employee who resigns for the reason of pregnancy, childbirth, or childcare can register for this rehiring program upon resignation.
	Regular health exams	An employee can receive paid leave to receive regular medical checkups after taking prenatal/postnatal leave, or childcare leave.
	Child nursing leave	An employee raising a child in third grade or younger can take unpaid leave for up to five days a year per child (half-day leaves are also permitted) for the purpose of caring for a child who is sick or injured, or who requires vaccination or a health exam.
Family care	Flextime eligibility	An employee not eligible for flextime but who has a family member needing care can apply for transfer to a workplace where flextime is permitted, and receive flextime.
	Expanded application of flextime	Upon application, an employee with a family member needing care can work shortened hours below the prescribed monthly work hours, and can work intermittently with interruptions and resumption of work.
	Family care leave	Can be taken for up to two years for each care recipient.
	Family care time off	Regardless of the number of family members in need of care, upon application, two unpaid days off a week can be taken (half-day increments allowed). If two days a week are taken, one of those days can be taken from the employee's yearly paid vacation days.
	Reinstatement registration system	An employee who resigns in order to care for a family member can register for this program at the time of resignation.
	Limits on non-scheduled work, overtime work, and late-night work	An employee with a family member needing care can refuse non-scheduled and after-hours work (late-night work limit is available to an employee with a family member requiring care, and who lives in a household without someone else, 16 or older, to provide the needed care).
Working from home	An employee who has a family member needing care, who is pregnant, or who has a preschool child can work from home if there is an issue that cannot be solved using the shortened working hours or flextime programs.	

Examination leave, prenatal and postnatal leave, and childcare time are programs exclusively for women. For information on mental and physical health promotion, see page 27.

Corporate Governance

Tokuyama sees internal control as the basis for CSR and works to strengthen corporate governance in order to further increase the confidence of stakeholders and enhance corporate value. In addition, the Company is thoroughly implementing risk management and compliance group-wide, as the core elements of internal control.

CSR issues: **Strengthening corporate governance; implementing risk management and compliance**

Tokuyama Group's Five Conscience Clauses

Our behavior shall:

- (1) Comply with laws, regulations and internal rules
- (2) Conform to the Tokuyama Group Code of Conduct
- (3) Justify the trust of customers and trading partners
- (4) Earn the respect of society and general consumers
- (5) Maintain standards that can be spoken of with pride in front of family members and coworkers

Corporate Governance at Tokuyama

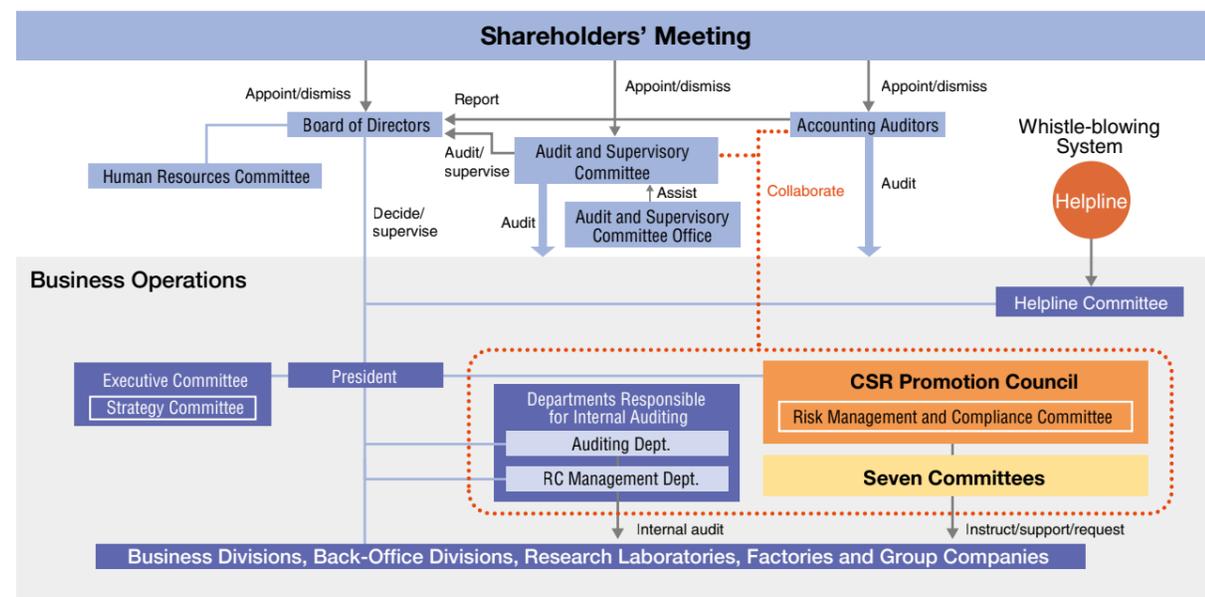
In keeping with Japan's Corporate Governance Code, Tokuyama respects the rights and equality of stakeholders and is strengthening the supervisory functions and independence of the Board of Directors. Tokuyama is also encouraging faster decision-making and clarifying the responsibilities for business execution, while endeavoring to practice suitable information disclosure, achieve transparency, and engage in constructive dialogue with shareholders.

In April 2019, the criteria for selecting outside directors were revised. This enables freer choice of independent outside director candidates suitable for improving the governance of the Company, and enhances the independence and supervisory function of the Board.

Corporate Governance Structure

Tokuyama's Board of Directors deliberates and makes decisions on important matters concerning the execution of the Company's business while supervising business operations. The Company has appointed three outside directors to the Board to

Corporate Governance Structure



strengthen its supervisory function.

The Audit and Supervisory Committee is comprised of four directors, including three outside committee members. They attend Board of Directors meetings and other important meetings to monitor the business execution by executive officers.

Comprised of representative directors and outside directors, the Human Resources Committee holds discussions on such matters as remuneration for directors and executive officers and the selection of candidates for director and executive officer positions.

The Executive Committee, comprised of executive officers selected by the president, meets twice a month to discuss and finalize key strategies adopted by the Board of Directors.

The Strategy Committee discusses important matters such as the pros and cons of pursuing certain businesses and the manner in which they should be executed, to assist the president in determining the direction of business objectives.

The Helpline Committee was set up as a whistleblowing channel to enable internal reporting of legally questionable actions and behavior.

Tokuyama has established the Auditing Department and the Responsible Care Management Department and tasked them with responsibility for internal auditing.

Risk Management

Tokuyama manages risk through the Risk Management and Compliance Committee, which operates under the CSR Promotion Council. It also has expert committees focused on risk management and compliance in seven critical and specialized areas to ensure management through the deliberation of key issues. The Company has designated a unit responsible for regulations concerning management of the risk of loss and conducts activities based on the management regulations.

It also works to mitigate compliance risk by establishing management systems for understanding important laws and regulations that are relevant to business execution and keeping track of trends in amendments to these laws and regulations. The Company also has established a business continuity plan (BCP) and other measures in order to ensure an appropriate response for the type and severity of any crisis.

Promoting Information Security

In order to reinforce the security of information assets, such as client information, Tokuyama has formulated a security policy and implemented various measures. There were no major information security incidents in fiscal 2018.

Compliance

Tokuyama understands "compliance" to have a broad meaning, including not only compliance with laws and internal rules but also behaving sensibly in a manner that conforms with corporate ethics and meets social expectations. To communicate and spread awareness of compliance throughout the Group, the Company has put together a handbook presenting the Tokuyama Group Code of Conduct, the responsibilities of Senior Management under the Tokuyama Group Code of Conduct, and the Tokuyama Group's Five Conscience Clauses. It is distributed to all Group employees.

Compliance Education & Training

To reduce compliance risk, Tokuyama provides training on legal obligations for new directors and auditors and a variety of compliance training programs for employees. In 2018, these training programs were held on 40 occasions. Tokuyama also implements e-learning programs for managers on compliance, workplace harassment prevention, security export control, and information security.

Whistle-Blowing System

An internal helpline has been established to enable safe, anonymous reporting and consultation regarding compliance violations involving the Tokuyama Group (including potential violations) without fear of unfavorable treatment. Reporting and consultation can be carried out by post, email, or phone.

The helpline is operated with due consideration for the protection of whistleblowers. Employees can use the helpline without disclosing their name or department to the Company, and women are able to consult with a female attorney.

Tokuyama Group Code of Conduct

All Tokuyama Group members commit to the following essential principles to ensure the Group operates in a way that meets social expectations and delivers sustained growth by earning the continued support of customers and the trust of society. (Established: May 12, 2009)

1. Compliance

We act with good corporate ethics and common sense, based on the understanding that compliance with laws and corporate rules is the most important requirement in all business activities.

2. Fair Business Activities

- We aim to be moderate and reasonable in our business and practice fair, free, and transparent competition.
- We maintain fair and reasonable relationships with political and governmental organizations.

3. Responsible Care

- We develop, manufacture and supply products and services that have value to society, with a constant focus on safety requirements, to ensure that we can satisfy our customers and consumers and earn their trust.
- We voluntarily and proactively address environmental issues based on an understanding of their significance to all people and their importance to the continuation of business activities.

4. Respect for Human Rights and Individuality

- We respect the basic rights of people in our business and do not discriminate on the basis of race, sexuality, creed, nationality or religion.
- We value diversity in the workplace and provide a safe and comfortable work environment to ensure satisfaction and opportunity for each employee.

5. Communications

We make fair and positive public disclosure of information about our Group including its business activities and financial reports to maintain good communication with society.

6. Social Contributions

- We actively seek to contribute to society as a good corporate citizen.
- We contribute to the development of local regions in our international business activities, respecting not only international rules, local laws, and regulations, but also local cultures and customs.

7. Exclusion of Antisocial Forces

We do not enter into any business arrangement with antisocial forces that threaten public order and safety.

Tokuyama Group Guidelines for Business Activities

(Preface)

These Guidelines set out the essential principles that govern the ongoing business activities of the Tokuyama Group (hereinafter referred to as the "Group"), which aims to realize a sustainable future in tandem with society and to gain the trust and appreciation of individual stakeholders.

I. Basic Principle

The Group will not only comply with laws, regulations and its corporate rules, but also adhere to strict corporate ethics and conduct its business activities with decency.

II. Relationship with Society

1. Contribution to Society
2. Environmental Conservation and Protection
3. Establishment of Systems for Ensuring Safety

In the course of the research, development and manufacture of its products as well as in the storage and transportation of its products and goods, including those manufactured by other companies, and in the provision of its services, the Group will comply with safety-related laws and regulations. At the same time, the Group will continually strive to increase the sophistication of its systems for ensuring safety.

4. Security and Export Control

To fulfill its responsibility to help maintain international peace and safety, the Group will comply with laws and regulations that control the export of cargo and technologies.

5. Nurturing Sound Relationships with Political and Governmental Organizations

The Group will nurture highly transparent relationships with political and governmental organizations, avoid behavior that can be alleged to constitute misconduct, and cultivate fair and sound relationships with such organizations.

6. Severing Ties with Antisocial Forces

The Group will take a firm stand against antisocial forces that pose a threat to public order and safety, and will thoroughly separate itself from any relationship with such forces.

III. Relationships with Customers and Trading Partners

1. Reliability of Products and Services

With a constant focus on safety requirements, the Group will develop and manufacture products and services that have value to society. In doing so, the Group will strive to implement a higher level of quality assurance in order to meet the quality requirements of its customers and consumers and earn their trust.

2. Fair, Free and Transparent Competition and Reasonable Trade
3. Entertainment and Gift Giving
4. Other Companies' Trade Secrets

IV. Relationship with Shareholders and Investors

1. Timely, Appropriate and Easy-to-Understand Information Disclosure

The Group will endeavor to disclose not only information on its business management and financial status, but non-financial information, including data on the products and services that it provides to society as well as on the environmental and social aspects of its business operations. In addition to its shareholders and investors, the Group will publicly disclose such information for the benefit of society and strive to make such disclosure timely, appropriate and easy-to-understand.

2. Prevention of Insider Trading

The Group will strive to prevent any person in its employ from exploiting non-public information pertaining to matters inside or outside the Group that he/she has come to know of in the course of his/her duties for the purpose of selling or buying securities, including stocks, for his/her own gain and, further, to prevent such persons from exploiting non-public information to provide benefits or favors to a third party.

V. Relationship with Executives and Employees

1. Respect for Human Rights and Prohibition of Discrimination
2. Respect for Privacy
3. Compliance with Labor-Related Laws and Regulations

The Group will respect the privacy of the persons in its employ and properly manage their personal information.

4. Workplace Safety and the Promotion of Health

The Group will comply with labor-related laws and regulations and strive to maintain a comfortable working atmosphere.

VI. Our Handling of Group Assets and Financial Reporting

1. Appropriate Use of Group Assets

The Group will efficiently utilize its tangible and intangible assets, protect such assets against impairment and theft, prohibit any personal use of such assets and ensure that such assets are appropriately administered.

2. Reliable Financial Reporting

3. Management of Confidential Information

4. Appropriate Use of Information Systems

The Group will appropriately use and administer its in-house information systems in accordance with its corporate rules.

5. Protection and Use of Intellectual Property Rights

Communication with Stakeholders

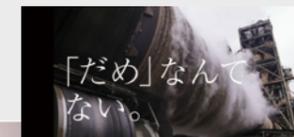
Tokuyama values communication with diverse stakeholders as the key to working with the broader society to build a sustainable future.



Material issue: **Engaging with local communities**

https://www.tokuyama.co.jp/feature/video_library.html
(Japanese site)

TV commercial "Fly off, far away"



TV commercial "No such things as 'I can't'."

ISO9001
TVCM
Factory tours



Technology for 100% recycling of waste gypsum board cited for Minister of Environment Award

Responsible Care, environmental management, ISO 14001
Reduction of CO₂ emissions, energy conservation, waste disposal, biodiversity initiatives, and development and provision of environmentally friendly products



Workplace patrols
In-house newsletters, education and training
Health and Safety Committee



In-house newsletters

Customers

Global Environment

Employees

Local Communities and Society

Business Partners

Shareholders and Investors

Purchasing management
CSR purchasing
Joint Occupational Health and Safety Conference



Joint Occupational Health and Safety Conference

Accident prevention, Responsible Care
Community Dialogue program, community volunteers, sponsorship of and participation in summer festivals, grants to promote science and technology, grants for raising the next generation, and safety and disaster prevention activities



Disaster preparedness drill

Briefing session for individual investors
Briefing session on financial results, brief statement of accounts
Annual Securities Report, General Meeting of Shareholders



Ordinary General Meeting of Shareholders

https://www.tokuyama.co.jp/eng/ir/report/annual_rep.html



Annual Report

Community Cooperation and Social Contribution Activities

As a company with an essential social role, Tokuyama also carries out various activities to maintain good relations with its neighbors. Interaction with local communities is being promoted not just by the Company, but also by employees, on their own initiative.

■ Supporting Recovery after Heavy Rains

Heavy rains in early July 2018 caused major disasters in various parts of western Japan including Yamaguchi Prefecture. In Shunan, there was a lot of damage caused by landslides and ground-floor flooding, leaving one person dead. The Company and its union jointly sent volunteers to the local disaster recovery center. A total of 28 volunteers participated over five days from July 23 to 27, 2018.

■ Participating in Volunteer Forestry Activities

On November 10, 2018, an event hosted by the Shunan Agriculture, Forestry and Fishery Office was held at a municipal conservation forest. About 130 Tokuyama employees and their families removed bamboo grass and weeds and thinned the forest.



■ Funding Original Research in the New Materials Field

The Tokuyama Science Foundation, established in 1988 to mark Tokuyama's 70th anniversary, provides grants for original theoretical and applied research for new materials development. It also helps fund international exchanges and symposia, and raises public awareness of science and technology. Total support provided over 30 years is about 1.025 billion yen. In fiscal 2017, 12 out of 138 applicants received grants totaling 24 million yen. They presented findings at the Foundation's 21st Research Results Reporting Meeting at the Tokuyama Factory on November 29 and 30, 2018.

■ Participating in the 2018 Shimane Chemistry Fair

The Chemistry Fair, held since 1993 in the regions of Shikoku and Chugoku, aims to show children the wonders of chemistry. The Tokuyama Science Foundation helps fund the Fair, and Tokuyama sets



up exhibits with hands-on experiments. At the May 2018 Fair, five employees presented an exhibit entitled, "Let's Make Honeycomb Toffee." The children saw how the thermal decomposition of baking soda caused the heated toffee to expand.

■ Supporting the Development of Children with an After-School Care Program



The Tokuyama Group's Shunan Swimming Club operates a swimming and fitness facility that makes use of exhaust heat from the Tokuyama Factory. It is also home to ACS Kids, a private after-school care facility that gives first- to third-graders a place to play and learn until 7:30 p.m. on weekdays. It offers a variety of programs such as swimming, tennis, dance, and physical exercise, as well as homework and tutoring, English conversation, and abacus classes.



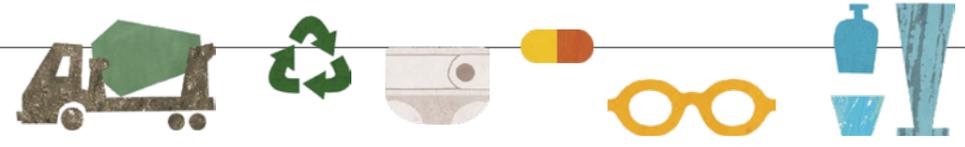
■ Tokuyama Factory Responsible Care Community Dialogue Program

The Tokuyama Factory has conducted the annual Responsible Care Community Dialogue since 2004 to help nearby residents better understand its efforts to prevent accidents and protect the environment.

The 15th annual dialogue, held on September 21, 2018, was conducted with the participation of 28 local residents, one official from Shunan City, and 19 Tokuyama Factory employees, including the general manager. A briefing on environmental protection efforts in cement manufacturing was followed by a tour of the Tokuyama and Nanyo Factories, with a visit to the cement central control room. One participant said the tour led to the realization that cement production can actually help reduce CO₂ emissions. With the understanding and support of local residents, the Tokuyama Factory will keep working hard on environmental preservation, disaster prevention and safety.

History of the Tokuyama Group's Business and Value Creation

Tokuyama provides products and services that help society and enrich people's lives in four businesses: Chemicals, Specialty Products, Cement, and Life & Amenity.



Chemicals Business Division



Soda Ash and Calcium Chloride Business

- ▶ Soda ash ▶ Sodium bicarbonate
- ▶ Calcium Chloride ▶ Sodium silicate cullet

Chlor-Alkali and Vinyl Chloride Business

- ▶ Caustic soda ▶ Hydrochloric acid
- ▶ Sodium hypochlorite
- ▶ Methylene chloride
- ▶ Propylene oxide (PO) ▶ Polyvinyl chloride (PVC)

New Organic Chemicals Business

- ▶ Isopropyl alcohol (IPA)

Specialty Products Business Division



Electronic Materials Business

- ▶ High-purity polycrystalline silicon ▶ Metallic boron

Fumed Silica Business

- ▶ Fumed silica ▶ High-purity fused spherical silica

Thermal Management Material Business

- ▶ High-purity Aluminum Nitride (AlN) Powder and Granules

IC Chemicals Business

- ▶ High-purity chemicals for electronics manufacturing
- ▶ Positive-type photoresist developer

Cement Business Division



Cement Business

- ▶ Portland cement ▶ Blast furnace slag cement
- ▶ Moderate-heat Portland Cement
- ▶ Cement-based soil stabilizer
- ▶ Ready-mixed concrete
- ▶ Construction and civil engineering materials

Recycling and Environment Business

- ▶ Utilization of waste plastic for fuel
- ▶ Utilization of incinerated ash as a raw material for cement
- ▶ Recycling of waste gypsum boards

Life & Amenity Business Division



MA Business

- ▶ Bulk pharmaceutical ingredients/intermediates

TS Business

- ▶ Plastic lens-related materials

NF Business

- ▶ Microporous film

Group Companies

- ▶ Polyolefin film ▶ PVC window
- ▶ Dental materials
- ▶ Medical diagnosis systems
- ▶ Ion exchange membranes and systems

Established to manufacture soda ash and cement businesses 1918 - 1944	Expanded inorganic chemicals and cement businesses 1945 - 1960	Entered petrochemical business 1961 - 1974	Expanded specialty and processing businesses 1975 - 1989	Strengthened and restructured core businesses 1990 - 2004	Focused on raising corporate value 2005 - 2015	Building a new foundation 2016 -
● 1920 ● 1930 ● 1940	● 1950	● 1960 ● 1970	● 1980	● 1990 ● 2000	● 2010	● 2020

Established domestic production of soda ash to resolve difficulty in securing imports during WWI

Used by-products from production of soda ash as raw materials for cement

1918 Established Nihon Soda Kogyo Co., Ltd. (currently Tokuyama Corp.) to produce soda ash in Tokuyama, Yamaguchi Prefecture (currently Shunan City)



1924 First shipment of caustic soda

1927 First shipment of soda ash

1938 Completed construction of captive central power station
Commenced production of cement

1940 Commenced production of calcium chloride

Met increased demand for cement during period of strong economic growth

Produced ammonium chloride as agricultural fertilizer to help increase postwar food production

1952 Commenced electrolytic chlor-alkali business

1960 Commenced production of precipitated silica
Completed construction of Nanyo cement plant to expand cement business



1961 Commenced ready-mixed concrete business

Launched petrochemical business to help develop infrastructure and improve people's lives

Strengthened environmental measures as society moved to address intensifying pollution

1964 Commenced petrochemical business

1966 Commenced polyvinyl chloride business



1967 Commenced ion exchange membrane business
Completed construction of Higashi plant to expand petrochemical business

1970 Commenced production of polypropylene (PP)

1971 Commenced construction materials business
Established Tokuyama Fiberglass Corp. (currently Tokuyama Mtech Corp.)

1972 Commenced production of isopropyl alcohol (IPA)



1973 Closed chlor-alkali plant using mercury cells process

1975 Commenced chlor-alkali production using diaphragm cell process

Promoted Company-wide energy conservation in response to global energy crisis

Entered value-added sectors such as electronic materials and fine chemicals

1976 Commenced polyolefin film business
Commenced PVC window business

1978 Commenced dental materials and equipment business

1982 Commenced consumer products business
Commenced fine chemicals business

1983 Commenced high-purity chemicals business for electronics industry
Commenced medical diagnosis systems business



1984 Commenced polycrystalline silicon business



1985 Commenced aluminum nitride business
Commenced gas sensor business by means of equity participation in Figaro Engineering Inc.
Completed construction of Kashima Factory



1988 Established A&T Corp. and commenced medical diagnosis system and equipment business

1989 Completed construction of the Tsukuba Research Laboratory

Provided cutting-edge materials and contributed to IT innovation

Strengthened competitiveness by integrating and spinning off businesses

1992 Established Sun - Tox Co., Ltd. as a joint venture of polyolefin film business

1995 Established Shin Dai-ichi Vinyl Corp. as a joint venture of PVC business

1996 Established Taiwan Tokuyama Corp. and Tokuyama Electronic Chemicals Pte. Ltd. in Singapore for high-purity chemicals business

1999 Established Sun Arrow Kasei Co., Ltd. for PVC compound business

2000 Established Yamaguchi Eco-Tech Co., Ltd. as a joint venture in recycling waste incinerator ash

Established Excel Shanon Corp. as a company of PVC window business



2001 Established Tokuyama Polypropylene Co., Ltd. as a joint venture in polypropylene business
Established Tokuyama Dental Corp. for dental materials and equipment business

2002 Established Shanghai Tokuyama Plastics Co., Ltd. in Shanghai, China for polyolefin microporous film business

2004 Established ASTOM Corp. for ion exchange membranes and systems

Pursued zero emissions and resource recycling with increasing demand for building a recycling-oriented society

Took on challenges of global business development and new environmental businesses

2005 Established Tokuyama Chemicals (Zhejiang) Co., Ltd. in China for fumed silica business

2009 Established Tokuyama Malaysia Sdn. Bhd. for PV polycrystalline silicon business (sold off in 2017)

2013 Established Yamaguchi Liquid Hydrogen Corp. for liquid-hydrogen business



Established Tokuyama Nouvelle Calédonie S.A. in New Caledonia, for cement business



Established Tokuyama Chiyoda Gypsum Co., Ltd. for recycling of waste gypsum boards

2014 Established TOKUYAMA & CENTRAL SODA Inc. (currently Tokuyama Soda Trading Co., Ltd.) for soda ash and calcium chloride business

2015 Established Tokuyama METEL Corp. as a joint venture for industrial detergent business

Strengthening initiatives in the fields of the environment, energy, ICT, and healthcare to help solve social issues through chemistry

2018 100th anniversary of foundation



Creating a low-carbon, recycling-oriented society

Environment



Supporting innovation

ICT



Contributing to health and longevity

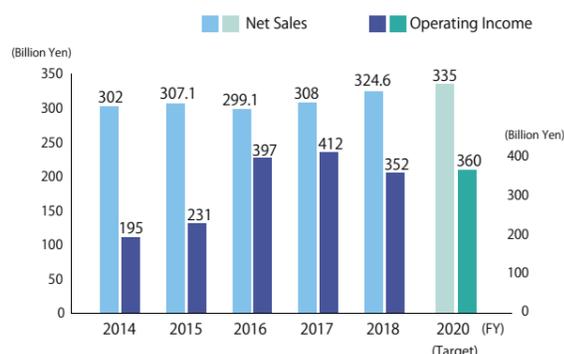
Healthcare

Financial Highlights

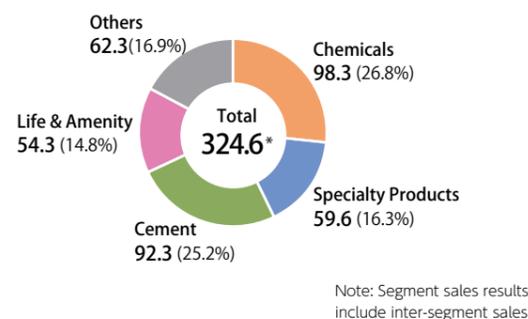
Implementing the Medium-Term Management Plan (April 2016–March 2021)

Under its corporate vision to build a new foundation, established in May 2016, Tokuyama drew up a five-year medium-term management plan starting from fiscal 2016 that seeks to: (1) change the organizational culture; (2) rebuild business strategies; (3) strengthen Group management; and (4) improve the Company's financial position. Now, a fifth point has been added to the medium-term management plan: (5) pursue initiatives to address the UN Sustainable Development Goals (SDGs). The aim is to help solve social issues.

Net Sales and Operating Income

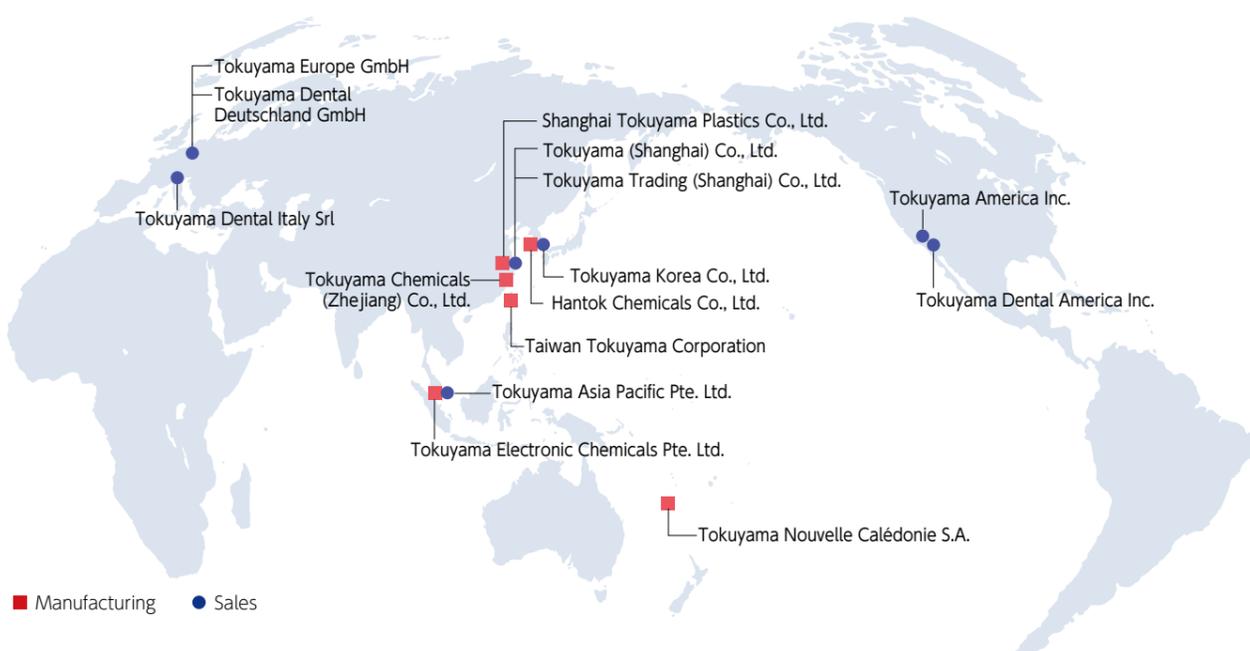


Fiscal 2018 Sales by Business Segment



Global Network

Tokuyama has expanded globally, with factories and sales branches now established in eight countries and regions around the world, primarily in Asia.



A Review of Tokuyama's CSR Report 2019



Eriko Nashioka

Representative Director, Institute for Environmental Management Accounting, Certified Public Accountant and Certified Tax Accountant, and part-time lecturer in environmental accounting and environmental auditing for the Faculty of Commerce, Doshisha University

Tokuyama Value Creation

The *CSR Report 2019* presents a clear picture of Tokuyama's value creation process, which is key to achieving the company's mission: "Creating value that benefits people's lives through chemistry." Tokuyama is also investigating the kind of value needed to benefit people's lives, while fulfilling its social responsibilities with business processes and product creation that improve society. The model calls for Tokuyama's technology to solve social issues—and this technology is achieved by providing ideas and opportunities for people in and outside the company to spontaneously cooperate. A good example of this is the innovative dental material featured in the Spotlight section. The material arose from a program that allows researchers to spend 10% of their work time on a non-primary theme that interests them. The program has resulted in the treatment of dental cavities, offering many people the value of being able to smile and speak without hesitation. This is

important for a fulfilling life. I expect Tokuyama will continue to provide new value to society and to grow in the future.

Identifying Materiality

Tokuyama began materiality analysis last year, and published the results in this report. The Company listed its CSR activities, organized and matched them to social issues that need to be addressed, and prioritized them to identify nine material issues and set KPIs for each one. The social issues to which the activities contribute were linked with the SDGs and described accessibly.

I was able to see at a glance the CSR management approach that Tokuyama is taking. Regarding issues to be addressed going forward, the reduction of CO₂ emissions is a global concern. Targets should be set for total CO₂ emissions reduction, and the approach to coal-fired thermal power generation ought to be clarified.

Communication with Stakeholders

The report presents examples of Tokuyama's close relationship with the neighborhoods around the Tokuyama Factory, where the company began. Readers would also like to know how Tokuyama is working to build relationships with investors, customers, employees and other stakeholders outside of local communities. I would suggest holding dialogues with a broader range of stakeholders to further enhance information disclosure.

Response to Third-Party Review

Kazuo Matsuya

Executive Officer
General Manager, Corporate Social Responsibility Division



Tokuyama marked its 100th anniversary in February 2018, embarking on a second century in business. We recognize that it is important to solidify our ESG foundation in order to achieve sustainable growth, and to help solve social issues, including SDG initiatives, through our main business activities. Everyone at the Tokuyama Group is focusing their efforts on this shared objective.

The *CSR Report 2019* disclosed material issues that we identified over the last year. Tokuyama's material issues are closely related to our overall CSR activities and in support of the SDGs. We will apply PDCA cycles, and disclose the progress in future CSR reports and via other channels. CO₂ emissions reduction is the most important issue for us as a company that gets most of its electricity from coal-fired power generation. Our CO₂ initiative policy and reduction targets were highlighted in "Close-up 1." To help in the fight against global warming, Tokuyama will pursue all possible measures, without exceptions. In addition, we will actively engage in dialogue with a wide range of stakeholders and apply their feedback in future activities.

Site Reports

Tokuyama Factory

Location: 1-1, Mikage-cho, Shunan-shi, Yamaguchi 745-8648, Japan
 Number of employees: 1,577
 Total site area: 1.91 million m²
 Main products: Cement, inorganic chemical products, organic chemical products, polycrystalline silicon, fumed silica, polyvinyl chloride, and other products



Hideki Adachi
Tokuyama Factory General Manager



Still situated at the Company's first business site, the Tokuyama Factory is the Group's main manufacturing facility, and its products account for about 90% of non-consolidated sales. The factory operates with the motto, "Go to work healthy and return home happy." In fiscal 2019, the Tokuyama Factory is placing top priority on measures to comprehensively remove risks and increase safety awareness and risk sensitivity, in an effort to ensure no accidents or disasters occur. Specifically, the plant is: (1) identifying and eliminating risks from contact with harmful substances, being caught in or between equipment, contact with high temperatures, and falling from height or to the same level; (2) pursuing dialogue on safety to eliminate the root causes of continuing risks on the production floor; (3) verifying that actual work conditions are consistent with work standards for subcontracted work, and identifying and eliminating risks; (4) implementing pointing and calling at crosswalks within the plant; and (5) verifying, executing, and reviewing the goals of safety activities on a daily basis.

Performance Data

	Unit	FY2014	FY2015	FY2016	FY2017	FY2018
SOx emissions	Metric tons	550	680	750	780	800
NOx emissions	Metric tons	8,850	8,900	9,500	10,100	10,100
Soot emissions	Metric tons	135	138	138	168	122
Industrial water consumption	Million metric tons	41.7	42.1	44.1	44.5	44.7
Effluent discharged	Million metric tons	23.9	24.2	24.2	24	24
COD level	Metric tons	110	124	114	119	127
Total nitrogen discharged	Metric tons	89	92	145	173	159
Total phosphorous discharged	Metric tons	2.6	2.2	2.1	2.1	2.3
PRTR-designated substance emissions	Metric tons	25	36	29	29	33
Waste generated	Thousand metric tons	354	389	376	366	339
Waste sent to landfills	Metric tons	313	383	368	382	397
Energy consumption	Thousand gigajoules	44,200	45,100	47,100	49,500	49,000
CO ₂ emissions (originating from fossil fuel)	Thousand metric tons	4,040	4,110	4,290	4,500	4,430
Complaints	Cases	0	1	0	0	3

Emissions and Transfer of Specific PRTR-Designated Substances in Fiscal 2018 Unit: metric tons (mg-TEQ equivalency for dioxins)

Substance name	Regulatory number	Amount of emissions				Amount transferred
		Atmospheric	Water	Soil	Subtotal	
1,2-Dichloroethane	157	10.0	0.0	0.0	10.0	1.8
Chloroethylene (vinyl chloride)	94	6.8	0.0	0.0	6.8	0.0
Chloromethane (methyl chloride)	128	3.8	0.0	0.0	3.8	0.0
Chlorodifluoromethane	104	3.0	0.0	0.0	3.0	0.0
Cresol	86	0.0	2.6	0.0	2.6	0.0
Toluene	300	2.4	0.0	0.0	2.4	6.7
Dichloromethane (methylene chloride)	186	1.3	0.0	0.0	1.3	0.0
Chloroform	127	0.8	0.0	0.0	0.8	0.0
1,2-Epoxypropane (propylene oxide)	68	0.6	0.0	0.0	0.6	1.8
Hydrazine	333	0.0	0.6	0.0	0.6	0.0
Water-soluble compounds of zinc	1	0.0	0.5	0.0	0.5	0.0
1-Bromopropane	384	0.5	0.0	0.0	0.5	0.8
1,2-Dichloropropane	178	0.4	0.0	0.0	0.4	146.1
Carbon tetrachloride	149	0.1	0.0	0.0	0.1	0.0
2,2-Azobisisobutyronitrile	16	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 form	374	0.0	0.0	0.0	0.0	0.0
Benzene	400	0.0	0.0	0.0	0.0	0.0
Boron compounds	405	0.0	0.0	0.0	0.0	1.1
Dioxins	243	35.6	2.4	0.0	38.0	0.0
Total (excluding dioxins)		29.6	3.8	0.0	33.4	158.3

Substances are listed in descending order of emissions levels; substances with no emissions are listed in order of the regulatory number

Water refers to public waters

Amount transferred indicates the sum of the quantity transferred to sewage systems and the quantity subject to intermediate treatment

Total figures have been rounded to the first decimal place

Kashima Factory

Location: 26 Sunayama, Kamisu-shi, Ibaraki 314-0255, Japan
 Number of employees: 78
 Total site area: 101,000m²
 Main products: **Produced by Tokuyama Corporation**
 Bulk pharmaceuticals for diabetes drugs, anti-hypertensive agents, eye drops, allergy medicines; optical materials (plastic lens monomer, light modulating materials, and hard coating solutions)
Produced by Tokuyama Dental Corporation
 Dental materials (composite resins, orthodontic materials, rebasing and relining materials, impression materials, and investment materials)



Yoshiyuki Kitajima
Kashima Factory General Manager



The Kashima Factory designates policies for process safety management and ensures that all workers follow them to create a safe workplace. In fiscal 2019, the factory is focusing on identifying and eliminating risks using change management to eliminate accidents and prevent disasters. It is also securing compliance with environmental regulations and prioritizing the reduction of environmental impacts through waste recycling. In fiscal 2018, the factory achieved an 86% waste effective utilization rate, generating eight metric tons of landfill waste and achieving a 99% recycling/reuse rate. The factory will increase the effective utilization rate for all waste by studying the feasibility of implementing materials recycling and thermal recycling.

Performance Data

	Unit	FY2014	FY2015	FY2016	FY2017	FY2018
Industrial water consumption	Thousand metric tons	48	43	36	39	25
Effluent discharged	Thousand metric tons	63	54	50	54	39
COD level	Metric tons	3	2	2	2	2
PRTR-designated substance emissions	Metric tons	2	2	2	2	1
Waste generated	Metric tons	1,020	735	775	761	831
Waste sent to landfills	Metric tons	11	20	9	9	8
Energy consumption	Thousand gigajoules	36	33	37	39	36
CO ₂ emissions (originating from fossil fuel)	Metric tons	2,465	2,246	2,670	2,697	2,594
Complaints	Cases	0	0	0	0	0

Emissions and Transfer of Specific PRTR-Designated Substances in Fiscal 2018 Unit: metric tons

Substance name	Regulatory number	Amount of emissions				Amount transferred
		Atmospheric	Water	Soil	Subtotal	
Dichloromethane	186	0.5	0.0	0.0	0.5	2.4
Chloroform	127	0.4	0.0	0.0	0.4	30.5
Toluene	300	0.1	0.0	0.0	0.1	4.0
Acetonitrile	13	0.0	0.0	0.0	0.0	0.8
N,N-Dimethylacetamide	213	0.0	0.0	0.0	0.0	2.0
N,N-Dimethylformamide	232	0.0	0.0	0.0	0.0	5.7
2-Vinylpyridine	338	0.0	0.0	0.0	0.0	0.2
Methyl methacrylate	420	0.0	0.0	0.0	0.0	0.0
Total		1.0	0.0	0.0	1.0	45.6

All figures are numerical sums for Tokuyama Corporation and Tokuyama Dental Corporation

Substances are listed in descending order of emissions level; substances with no emissions are listed in order of the regulatory number

Water refers to public waters

Amount transferred indicates the sum of the quantity transferred to sewage systems and the quantity subject to intermediate treatment

Total figures have been rounded to the first decimal place

Sun-Tox Co., Ltd.

Established: February 14, 1992
 Shareholders: Tokuyama Corporation (80%), Rengo Co., Ltd. (20%)
 Head office: ORIX Ueno1chome Building, 1-1-10 Ueno, Taito-ku, Tokyo, Japan
 Business activities: Manufacture and sale of biaxial-oriented polypropylene films and cast polypropylene films



Kazunori Shimada
Plant Manager



Location: 3075-18 Shimasu, Itako-shi, Ibaraki, Japan
 Number of employees: 205
 Total site area: 89,800m²

■ Kanto Plant

Sun-Tox's Kanto Plant manufactures biaxial-oriented polypropylene films and cast polypropylene films, which are used for food packaging and other applications. In fiscal 2017, the plant received the Cogeneration Grand Prize for upgrading its gas cogeneration facilities and added another line to its biaxial-oriented polypropylene film manufacturing facility. These high efficiency facilities will help the Kanto Plant to further reduce energy consumption and environmental impacts. The plant also takes part in clean-up activities inside and around the industrial complex to promote harmony with the local community. As it continues to implement three management systems, namely Japan's Occupational Safety and Health Management System (OSHMS), ISO 14001, and ISO 9001, the plant is building on its achievements with the aim to be a community-based factory.

Performance Data

	Unit	FY2014	FY2015	FY2016	FY2017	FY2018
Waste generated	Metric tons	20	15	23	38	44
Waste sent to landfills	Metric tons	10	5	10	17	44
Energy consumption	Thousand gigajoules	351	356	403	467	514
CO ₂ emissions	Thousand metric tons	20	21	23	23	25
SOx emissions	Metric tons	0.3	0.3	0.1	—	—
NOx emissions	Metric tons	0.6	0.7	0.4	1.0	1.3
Soot emissions	Metric tons	0.05	0.04	0.02	0.01	0.04

■ Tokuyama Plant

Sun-Tox's Tokuyama Plant manufactures biaxial-oriented polypropylene films, which are mainly used for food and beverage packaging, amounting to about 23,000 metric tons annually. As part of its environmental initiatives, the plant is actively working to reduce per-unit energy consumption and increase recycling rates. With respect to safety, it acquired OSHMS certification in 2013 for all of its departments including R&D departments. Under the slogan, "Strictly following safety procedures, making manufacturing enjoyable, and never compromising quality," the plant aims to keep its facilities operating safely so it can be depended upon by the community, customers and employees.

Performance Data

	Unit	FY2014	FY2015	FY2016	FY2017	FY2018
Waste generated	Metric tons	76	74	84	68	86
Waste sent to landfills	Metric tons	1	1	1	1	1
Energy consumption	Thousand gigajoules	458	471	463	422	368
CO ₂ emissions	Thousand metric tons	27	27	28	25	20
PRTR-designated substance emissions	Metric tons	0.0	0.0	0.0	0.0	0.0
Complaints	Cases	0	0	0	0	0



Nobuhiko Nakayama
Plant Manager



Location: 7-7, Harumi-cho, Shunan-shi, Yamaguchi, Japan
 Number of employees: 144
 Total site area: 24,100m²

Sun Arrow Kasei Co., Ltd.

Established: February 1, 1999
 Shareholder: Tokuyama Corporation (100%)
 Head office: 1-2 Harumi-cho, Shunan-shi, Yamaguchi, Japan
 Business activities: Manufacture and sale of polyvinyl chloride compounds



Yasuto Yasuzawa
Plant Manager



Location: 1-2 Harumi-cho, Shunan-shi, Yamaguchi, Japan
 Number of employees: 29
 Total site area: 3,280m²

■ Tokuyama Plant

Sun Arrow Kasei's Tokuyama Plant manufactures and sells polyvinyl chloride compounds used for pipes, joints, and other items essential for upgrading infrastructure, as well as PVC windows, which are highly effective for saving energy. Practicing ISO 14001 environmental management and having all employees take part in safety and accident prevention efforts has helped the plant to maintain a record of zero accidents requiring work absences for all 20 years it has been operating. Since acquiring ISO 9001 certification in fiscal 2017, the plant has further improved customer satisfaction with a focus on the environment, safety and quality control, while strictly enforcing internal controls and carrying out Responsible Care activities.

Performance Data

	Unit	FY2014	FY2015	FY2016	FY2017	FY2018
Power consumption	Thousand kilowatt hours	2,473	2,659	2,490	2,533	2,631
Waste plastic produced	Metric tons	108	141	135	128	171
Waste plastic effectively used	Metric tons	105	141	135	128	171
Waste sent to landfills offsite for disposal	Metric tons	8	6	0	0	0
Steam usage	Metric tons	240	240	240	240	240
Industrial water consumption	Thousand metric tons	65	65	65	65	65

Tokuyama Polypropylene Co., Ltd.

Established: April 2, 2001
 Shareholders: Tokuyama (50%), Prime Polymer Co., Ltd. (50%)
 Location: 1-1 Harumi-cho, Shunan-shi, Yamaguchi, Japan
 Business activities: Manufacture and sale of polypropylene resin and flexible polypropylene resin



Yuichi Taguchi
Plant Manager



Location: 1-1 Harumi-cho, Shunan-shi, Yamaguchi, Japan
 Number of employees: 63
 Total site area: 70,997m²

■ Tokuyama Plant

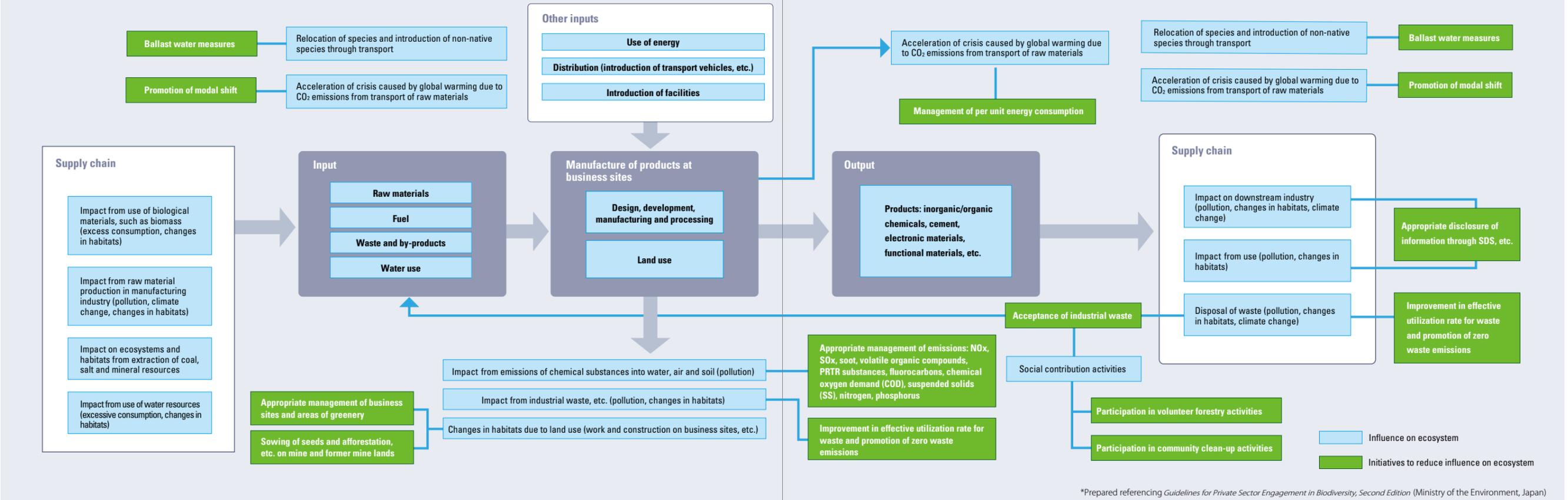
Tokuyama Polypropylene's Tokuyama Plant conducts risk assessments of processes, facilities, and operations, and takes measures to identify near-miss situations and points of concern, in order to enhance the plant's safety culture. The result has been a perfect accident- and disaster-free record since the time it was first established as Tokuyama's polypropylene film business 43 years ago. The plant is scheduled to obtain recertification in 2019 under the High Pressure Gas Safety Act and the Ordinance on Safety of Boilers and Pressure Vessels, and is pursuing Responsible Care activities with the goals of extending its accident- and disaster-free record, reducing its environmental impact, and eliminating customer complaints related to quality.

Performance Data

	Unit	FY2014	FY2015	FY2016	FY2017	FY2018
Industrial water consumption	Thousand metric tons	308	370	333	378	343
Waste generated	Metric tons	89	35	77	35	66
Waste sent to landfills	Metric tons	2.4*	0	1.8*	0	1.6*
Unit energy consumption index (fiscal 2002=100)	%	76	71	73	69	70

* Year with periodic maintenance

Business Activities and Biodiversity



*Prepared referencing *Guidelines for Private Sector Engagement in Biodiversity, Second Edition* (Ministry of the Environment, Japan)

Environmental Data for Tokuyama

Input (Unit: 1,000 metric tons)	FY2014	FY2015	FY2016	FY2017	FY2018	Comparison with previous fiscal year (%)
Waste and by-products	1,790	1,780	1,830	1,880	1,870	-0.5
Fuel	1,820	1,810	2,050	2,250	2,150	4.4
Raw materials	5,900	5,990	6,020	6,760	6,670	1.3
Industrial water	41,700	42,100	44,100	45,500	44,700	1.8
Output (Unit: 1,000 metric tons)	FY2014	FY2015	FY2016	FY2017	FY2018	Comparison with previous fiscal year (%)
Carbon dioxide	5,930	5,910	6,000	6,300	6,500	3.2
Waste (incinerated and landfill)	21	22	22	21	23	9.5
Substances with environmental impact	10	9.7	9.9	10.6	11.4	7.5
Process effluent	22,100	24,000	24,200	24,200	24,500	1.2

Energy Consumed on a Per-Unit Basis at the Tokuyama Factory

Unit: %	Base year (FY2005)	FY2015	FY2016	FY2017	FY2018	Target (FY2020)
Per-unit energy consumption	100	94.6	93.6	90.5	91.2	97.0

Energy Consumption

Unit: 1,000 gigajoules	Base year (FY2005)	FY2014	FY2015	FY2016	FY2017	FY2018
Tokuyama Corporation	53,700	44,400	45,300	47,300	49,600	49,100
Group companies	3,500	2,800	2,700	2,500	2,700	2,600

Emissions of CO₂

Unit: 1,000 metric tons	Base year (FY2005)	FY2014	FY2015	FY2016	FY2017	FY2018
Originating from fuel	4,820	4,040	4,120	4,300	4,510	4,440
Originating from raw materials	2,110	1,630	1,590	1,720	1,820	1,800
Originating from waste matter	210	230	230	250	250	280
Group companies	250	200	200	190	190	180

Emissions of SO_x, NO_x, and Soot

Unit: Metric tons	FY2014	FY2015	FY2016	FY2017	FY2018	Comparison with previous fiscal year (%)
SO _x	550	680	750	780	800	2.6
NO _x	8,850	8,900	9,470	10,100	10,100	0.0
Soot	135	138	138	168	122	-27.4

Emissions of PRTR Substances

Unit: Metric tons	FY2014	FY2015	FY2016	FY2017	FY2018	Comparison with previous fiscal year (%)
Tokuyama Corporation	27	37	30	30	34	13.3%
Group companies	36	40	34	37	34	-8.1%

Emissions of Hazardous Air Pollutants

Unit: Metric tons	FY2014	FY2015	FY2016	FY2017	FY2018	Comparison with previous fiscal year (%)
Dichloromethane (methylene chloride)	1.5	1.7	2.3	1.8	1.4	-22.2
Chloroform	2.1	1.1	1.7	1.6	1.2	-25.0
1,2-Dichloroethane	4.9	10.6	6.4	6.3	10	58.7
Chloroethylene (vinyl chloride)	5	7.7	5.4	7.6	6.8	-10.5

Discharge of Industrial Effluent

Unit: million metric tons	FY2014	FY2015	FY2016	FY2017	FY2018	Comparison with previous fiscal year (%)
Industrial effluent	24.1	24.2	24.2	24	24.5	2.1

Water Pollutant Emissions

Unit: Metric tons	FY2014	FY2015	FY2016	FY2017	FY2018	Comparison with previous fiscal year (%)
COD	112	126	116	121	129	6.6
Nitrogen	89	92	145	173	159	-8.1
Phosphorous	2.6	2.2	2.1	2.1	2.3	9.5

Landfilled and Recycled Waste

Unit: metric tons	Base year (FY1990)	FY2014	FY2015	FY2016	FY2017	FY2018
Landfilled waste	36,260	320	400	380	390	400
Effective utilization rate (%)	76.9	93.9	94.3	94.2	93.8	93.1
"Zero emissions" rate (%)	82.4	99.9	99.9	99.9	99.9	99.9

Breakdown of Waste Treatment Methods

Unit: 1,000 metric tons	FY2014	FY2015	FY2016	FY2017	FY2018	Comparison with previous fiscal year (%)
Waste recycled in-house	312	346	332	317	286	-9.8
Waste recycled externally	21.9	21.4	23.1	26.7	30.2	13.1
Incinerated waste	21.3	21.9	21.5	22.5	23	2.2
Waste sent to landfills	0.3	0.4	0.4	0.4	0.4	0.0
Total waste generated	355	389	377	367	339	7.6

Amount of Waste Matter and By-Products Used to Produce Cement

Unit: Kg per metric ton of cement	Base year (FY1991)	FY2014	FY2015	FY2016	FY2017	FY2018
Amount used	227	448	459	441	430	425

Material and Thermal Recycling Amounts in Cement Production

Unit: 1,000 metric tons	Base year (FY1991)	FY2014	FY2015	FY2016	FY2017	FY2018
Material recycling	1,550	1,702	1,711	1,746	1,800	1,786
Thermal recycling	4	86	74	84	79	82



Corporate Data

Company name: Tokuyama Corporation

Location: Tokyo Head Office

FRONT PLACE AKIHABARA, 7-5, Sotokanda 1-chome,
Chiyoda-ku, Tokyo 101-8618, Japan
Tel: +81-3-5207-2500 Fax: +81-3-5207-2580

Tokuyama Factory

1-1, Mikage-cho, Shunan-shi, Yamaguchi 745-8648,
Japan (Registered address)
Tel: +81-834-34-2000 Fax: +81-834-33-3790

Other facilities in Japan

Kashima Factory, Tsukuba Research Laboratory, Osaka Office,
Takamatsu Branch, Hiroshima Branch, Fukuoka Branch,
Sendai Branch, Shunan Sales Branch

President: Hiroshi Yokota

Established: February 16, 1918

Capital: 10 billion yen

Number of employees: 5,471 (consolidated basis; including 522 working overseas);
1,924 (non-consolidated basis)

Number of group companies: 82

Main businesses: Manufacture and sale of the following chemicals and products

Chemicals: Soda ash, chlor-alkali, vinyl chloride and new organic chemicals

Specialty Products: Polycrystalline silicon, fumed silica, high-purity chemicals for electronics manufacturing and aluminum nitride

Cement: Cement, recycling and environment-related business

Life & Amenity: Bulk pharmaceutical ingredients, plastic lens-related materials, dental materials, medical diagnosis systems, ion exchange membranes, microporous films, polyolefin films, PVC windows

Securities code: 4043 (First Section of the Tokyo Stock Exchange)

Editorial Policy

● The *CSR Report 2019* has been compiled for the purpose of providing stakeholders with clearly presented information on the Tokuyama Group's CSR initiatives and overall business activities. The PDF edition, available at the website below, includes Site Reports which could not be included in the print edition due to space limitations.

<https://www.tokuyama.co.jp/eng/csr/>



● Eriko Nashioka of the Institute for Environmental Management Accounting was invited to offer a third-party opinion on this report.

● The *CSR Report 2019* has been produced based on the Environmental Reporting Guidelines (fiscal 2018 edition) published by the Ministry of the Environment of Japan and GRI standard published by Stichting Global Reporting Initiative.

Scope of the Report

Period covered: Performance data is from fiscal 2018 (April 1, 2018 to March 31, 2019); certain activities carried out in fiscal 2019 are also covered.

Companies covered: Tokuyama Group; environment-related data is for the Company's Tokuyama Factory and Kashima Factory; some performance data includes the sum of the data from 22 manufacturing subsidiaries of the Tokuyama Group in Japan.

Areas covered: Activities reported on were mainly carried out in Japan; however, some activities include group subsidiaries outside Japan.

Date of issue: September 30, 2019

Next issue (tentative): September 2020 (previous issue was in September 2018)

Photo: The Tokuyama Factory overlooks the rich waters of the Seto Inland Sea. This location was established 100 years ago in the city of Shunan in Yamaguchi Prefecture and has grown together with the residents of the local community.