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Chemistry with a heart
TOKUYAMA



CSR Report 2020



Cover

The cover illustration is a rendering of the Tokuyama Factory, located in the Shunan industrial complex with views of the Seto Inland Sea. The factory is rendered in gentle shapes in sharp contrast to its man-made, physical presence, and is meant to evoke Tokuyama's pursuit of creating new value for the future.



Published in September 2020



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

Strengthening Corporate Governance

In 2019, outside directors accounted for one-third of our Board, meeting the standards under Japan's Corporate Governance Code. We are drawing on the functional expertise of our outside directors to assemble our next medium-term business plan.

This includes building a shared recognition of the Company's long-term priorities with the outside directors, and discussing Tokuyama's future vision based on it.

Responsible Care

Safety and accident prevention continues to be our highest priority in fiscal 2020. In fiscal 2019, we recorded one minor accident at a contractor. In addition to conventional safety measures focusing on worksite safety training, we are working to remove all unsafe elements from the worksite that could lead to accidents.

In terms of the environment, we achieved a 99.8% reuse/recycling rate for waste, down by 0.1 percentage points. While this was only a small decline, we are reviewing our environmental training and establishing rules to ensure that all employees receive training and education, in order to enhance our everyday efforts to achieve zero emissions.

Reducing CO₂ Emissions

We are making every effort possible to reduce carbon dioxide (CO₂) emissions. Nearly all of Tokuyama's CO₂ emissions come from its private power plants. To reduce these emissions, we are increasing combustion efficiency and switching from fossil fuels to biomass for power generation.

In January 2020, we launched the CO₂ Project Group, which is responsible for developing a scenario and roadmap for the long-term reduction of CO₂ emissions. The elements of the roadmap include shifting to biomass power generation and renewable energy, reconfiguring manufacturing processes to use emitted CO₂, and developing technologies for putting CO₂ to use as a raw material. We will incorporate the roadmap into our business plans to ensure that it is executed.

Addressing Social Issues through Our Business

In the field of information and communications technology (ICT), we are focusing on heat dissipation materials. By supplying materials that offer enhanced heat-dissipating performance, we can facilitate the adoption of electric vehicles and decrease heat consumption at data centers, thereby helping to reduce CO₂ emissions. We will invest in facilities and human resources for technology development.

In the healthcare field, we are developing supplements including bulk pharmaceuticals for generic drugs in order to supply products that enhance people's health and quality of life. Infectious disease measures will become even more important in the future as a consequence of climate change. We will focus on providing solutions as a chemicals manufacturer, such as supplements that enhance immunity and systems to facilitate rapid testing.

COVID-19 Response

To secure business continuity, we are taking even stronger measures to diversify our raw material suppliers. We are establishing multiple supply networks for pharmaceutical bulk ingredients and intermediates synthesis, and rebuilding our procurement networks in Japan.

In response to COVID-19, starting in March 2020 we changed our rules to enable more employees to work from home, prioritizing their safety. From April onwards, almost nine out of ten of our employees in Tokyo, Osaka, and other urban areas were working from home. We are taking this opportunity to implement changes that will improve productivity.

As part of our community initiatives, in April 2020 we donated sodium hypochlorite (for use as a disinfectant) to Shunan City, where our manufacturing is based. We are also committed to doing what we can as a chemicals manufacturer to help communities in times of need.

Changing How Employees Work, and Managing Diversity and Inclusion

We expect that having more employees work from home will change our organizational culture. Working efficiently at home may enable employees to continue their careers when faced with life events such as having a child, parenting or elderly care. Working from home also increases opportunities for men to take on a share of family care and household duties. This will increase the acceptance of parenting and elderly care leave. Furthermore, widespread access to 5G networks in the future will enable people to work in more diverse ways. For example, there will be more types of work available to persons with disabilities. In light of these trends, we are working hard on diversity and inclusion management, including promoting equal opportunities for women.

Contributing to a Sustainable World

In September 2019, Tokuyama Corporation became a signatory to the United Nations Global Compact. Since fiscal 2017, we have been implementing initiatives to achieve the Sustainable Development Goals (SDGs) as part of our commitment to corporate social responsibility (CSR). In order to align our business targets and achievement strategies with our CSR commitment and further enhance these CSR efforts, we are incorporating CSR into our next medium-term management plan. Moving forward, more emphasis will be placed on environmental issues. We recognize that it will be difficult to survive unless we deliver on CSR goals and help to achieve the SDGs through our business activities, doing our part to build a sustainable world.

Tokuyama's Business and the SDGs

Tokuyama manufactures products that are useful to customers and make the world better, applying its own technology to the priority fields of environment and energy, ICT, and healthcare. In this way, Tokuyama is helping people to live with greater convenience, amenity, and security.



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.

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 Group updated its SDG implementation policy in December 2019. Under this policy, the Group will continue pursuing R&D targeted toward the SDGs, aiming to be essential to society and remain the choice of customers.

Environment & Energy

► Hydrogen

Hydrogen is a co-product of the manufacturing process for caustic soda, and holds promise as a next-generation energy source.



► Recycling of industrial waste

Industrial waste that would otherwise be incinerated or ends up in landfills is recycled to make cement and other materials.



► Utilization of waste plastic for fuel

Waste plastic is collected and used in cement factories as alternative thermal energy.

► Wastewater processing

Caustic soda is used to reduce environmental impact through its use in flue gas desulfurization, wastewater neutralization treatment, etc.

► PVC windows

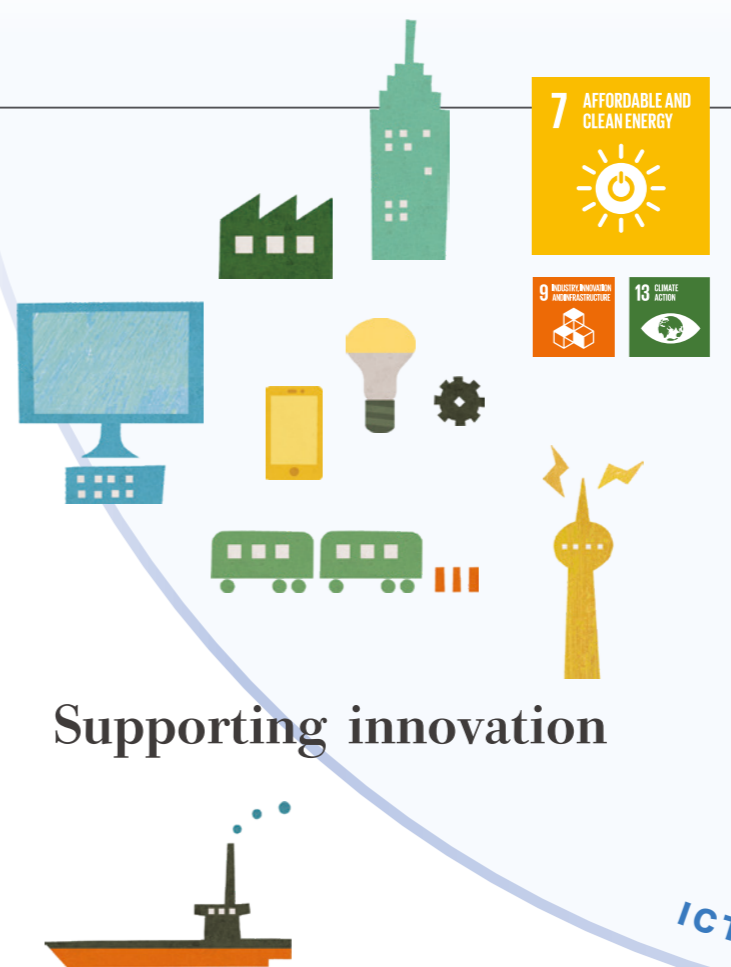
PVC windows are more airtight and better insulated than typical aluminum sash windows, which reduces electricity consumption for heating and air-conditioning, and significantly reduces CO₂ emissions.



Creating a low-carbon, recycling oriented society



Supporting innovation



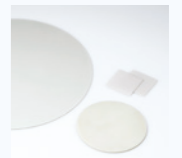
► Semiconductor materials

Polycrystalline silicon is used to make silicon wafers for semiconductors. Tokuyama holds the top market share in Japan.



► Thermal management materials

Nitride ceramic materials offer excellent heat dissipation performance to enhance the performance of power control elements.



► High-purity chemicals for the electronic industry

High-purity chemicals including metal-cleaning solvent, photoresist developer, and isopropyl alcohol (IPA) meet needs in the manufacture of advanced semiconductors.



ICT

Contributing to health and longevity



► Bulk pharmaceutical ingredients

Process development for active ingredients in treatment drugs for diabetes, hypertension, and allergies, and manufacturing of bulk ingredients and intermediates.



► Plastic lens-related materials

Photochromic lens materials help to protect the eyes from UV rays.

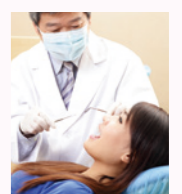


► Disinfectant and bleach ingredients

Sodium hypochlorite is a tap water disinfectant and household bleach ingredient. Tokuyama donated sodium hypochlorite to Shunan City to support its COVID-19 response.

► Dental materials

These innovative materials contribute to healthy teeth, including the world's first smart chromatic technology that adapts to match any tooth color from one shade.



► Medical diagnosis systems

Sample test automation systems for clinical testing significantly alleviate the burden on medical practitioners and support medical settings.



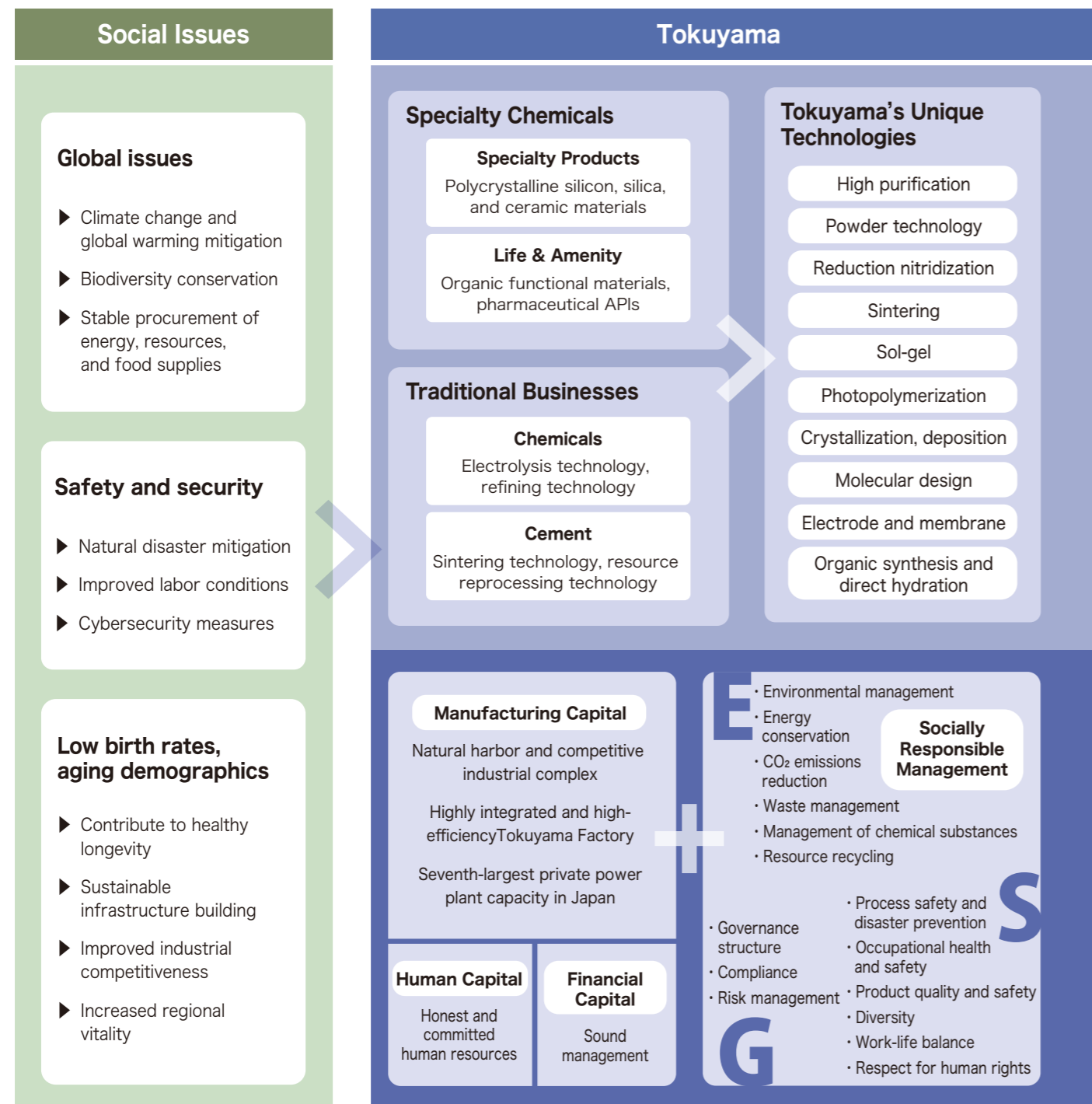
► Microporous film

Microporous films that repel water but allow air and moisture to pass through are used in back sheets for disposable diapers and feminine napkins.



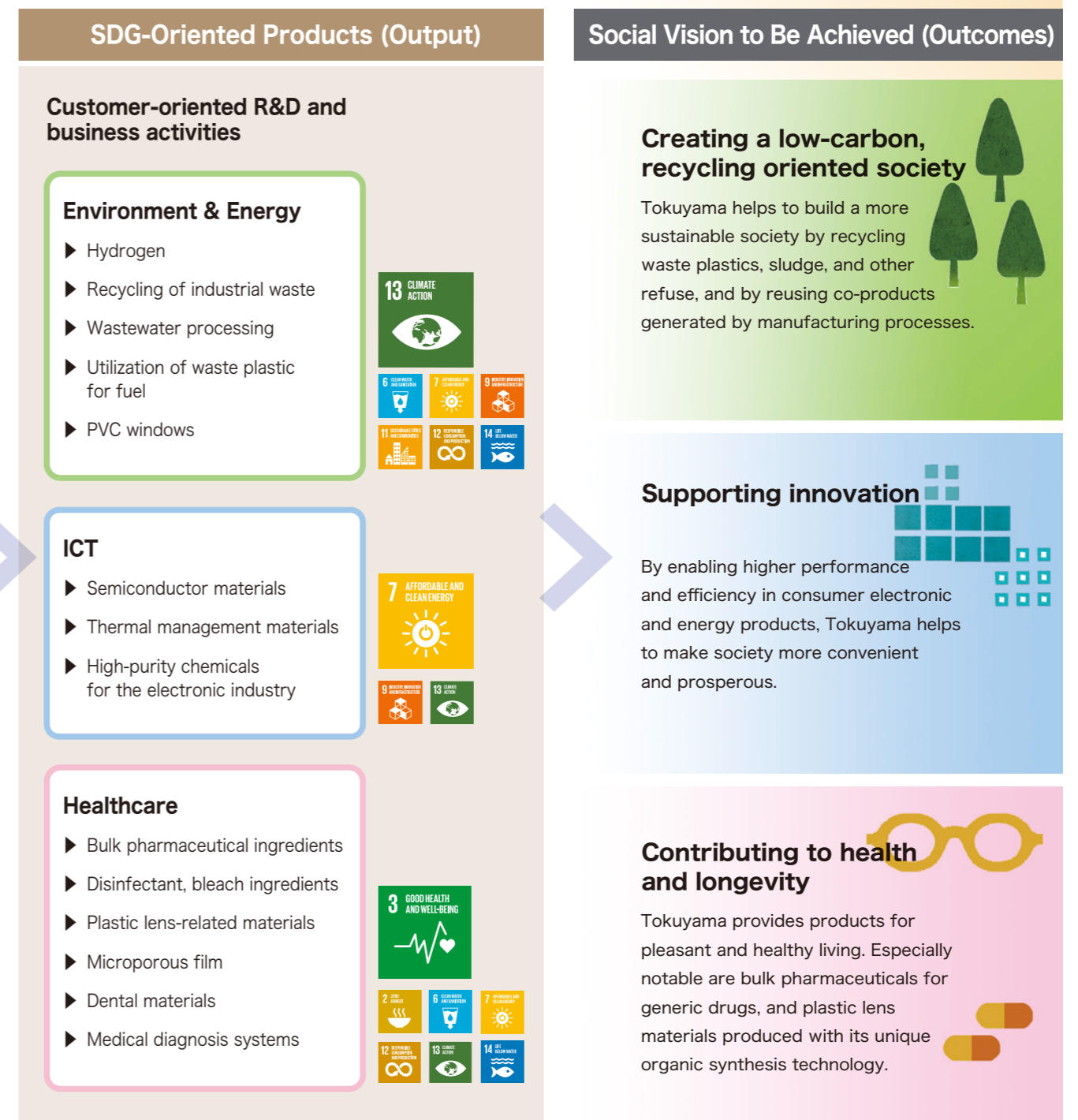
The Value Creation Process at Tokuyama

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.



TOKUYAMA VISION

Creating Value That Benefits People's Lives through Chemistry



History of Value Creation by the Tokuyama Group

Tokuyama Corporation was founded in 1918 by Katsujiro Iwai, who operated an import trading business. The company was originally called Nihon Soda Kogyo Co., Ltd. and was based in Tokuyama, Yamaguchi Prefecture, now known as Shunan City. For more than a century, Tokuyama has answered diverse needs by supplying raw materials and developing new materials and technologies that have been essential to industrial progress. Tokuyama is committed to fulfilling its role as a chemicals manufacturer to be part of the solution to social issues.

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

1952 Commenced electrolytic chlor-alkali business

1960 Commenced production of precipitated silica (ceased production in 2010)

Completed construction of Nanyo cement plant to expand cement business



1961 Commenced ready-mixed concrete business

Met increased demand for cement during period of strong economic growth

Expanded inorganic chemicals and cement businesses 1945-1960

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

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.)

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

Entered petrochemical business 1961-1974

Strengthened environmental measures as society moved to address intensifying pollution

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

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

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

Expanded specialty and processing businesses 1975-1989

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

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

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

Provided cutting-edge materials and contributed to IT innovation

Strengthened and restructured core businesses 1990-2004

Strengthened competitiveness by integrating and spinning off businesses

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

Focused on raising corporate value 2005-2015
Building a new foundation 2016-

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. for industrial detergent business

2019 Finished construction of Taiwan Tokuyama Corporation's second (Yunlin) plant for manufacturing of high-purity chemicals for the electronics industry



Tokuyama and CSR

Tokuyama practices corporate social responsibility (CSR) by fulfilling its mission to use chemistry to create value that enhances people's lives. By leveraging the chemical technologies it has developed and practicing socially responsible management, Tokuyama will continue to create and supply new value that brings contentment to people and contributes to social progress.

Tokuyama Vision and CSR

In May 2016, Tokuyama adopted a corporate vision that includes the mission of creating value that enhances people's lives through chemistry. This 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's mission of creating value that enhances people's lives has two drivers. Firstly,

Tokuyama is creating products that help to address social issues through its businesses and R&D. Secondly, Tokuyama is meeting its social responsibilities in business processes by ensuring internal controls and practicing risk management and compliance. 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 operation and continuous improvement of management systems for safety, the environment, and quality.

Tokuyama's commitment to respect human rights and prohibit discrimination is outlined in its Code of Conduct and Guidelines for Business Activities. Tokuyama also prohibits child labor and forced labor, and asks suppliers to comply with these principles.

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.



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.

CSR Framework

Tokuyama operates a CSR Promotion Council chaired by the President and Executive Officer (hereafter, "President") and comprises all executive officers in Japan. The council decides on CSR policies and goals, and facilitates their implementation. CSR is built upon a platform of appropriate corporate governance and internal controls. Accordingly, the council discusses important matters related to internal controls.

The Risk Management and Compliance Committee operates under the CSR Promotion Council and is chaired by the director responsible for CSR. The committee has a central role in implementing risk management and compliance, which are the two pillars at the core of internal controls (see page 44).

Signatory to United Nations Global Compact

In September 2019, Tokuyama Corporation became a signatory to the United Nations (UN) Global Compact. Under this commitment, Tokuyama complies with the Ten Principles of the UN Global Compact, which are organized under the four headings of human rights, labor, environment, and anti-corruption. In addition, the entire Tokuyama Group is endeavoring to further enhance its socially responsible management.



Strengthening Our Efforts to Address Material Issues, to Build a Sustainable Future

Creating value that enhances people's lives through chemistry is the keystone to Tokuyama's existence and has been its 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.

In fiscal 2019, during the process of incorporating the SDGs into our management priorities, we reviewed the

Hideo Sugimura

Director, Managing Executive Officer in charge of Corporate Social Responsibility



Group's CSR issues both from an inside-out (internal) and outside-in (external) perspective.

As a result, we identified nine CSR issues that are of material importance to the Group and made it a priority to achieve our fiscal 2020 targets based on key performance indicators (KPIs). The Group's achievement level for fiscal 2019 is summarized on page 15 of this report.

In fiscal 2020, we will strengthen our pursuit of material issues that have yet to be fully addressed. We will also make a strong effort to develop products and technologies that reduce CO₂ emissions or contribute to the achievement of SDG targets.

Materiality Assessment

Tokuyama has been pursuing a variety of initiatives in an effort to create value that enhances 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

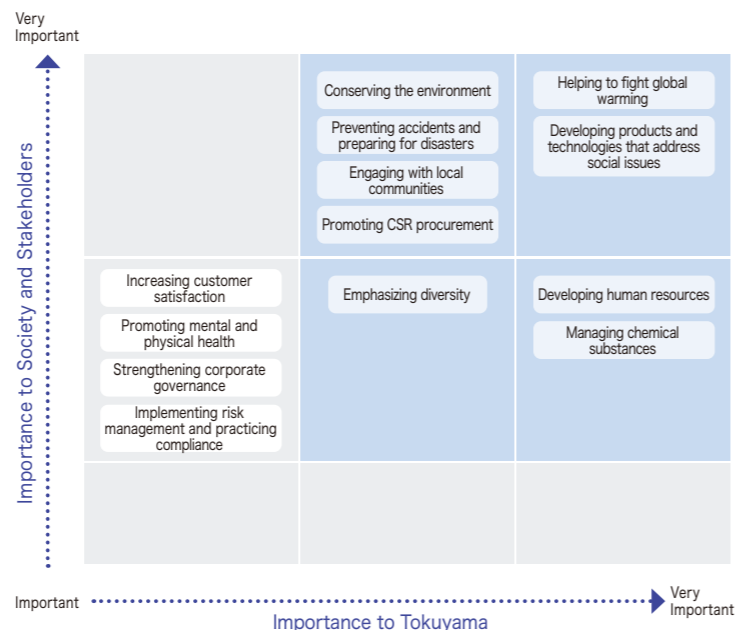
In March 2019, Tokuyama conducted a materiality assessment to align its CSR initiatives and management priorities. This assessment extracted and identified issues that are of particular material importance to Tokuyama, so that it can concentrate its management resources on resolving these issues.

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.

In fiscal 2019, Tokuyama implemented PDCA management by verifying the action taken on material issues and achievement of KPIs, as well as making necessary improvements. The material issues were reviewed by assessing the progress of the initiatives at the start of fiscal 2020, and the order of priority and scope of impact (boundaries) were reviewed. Additionally, Tokuyama is engaging stakeholders and external authorities in dialogue to verify the suitability of the material issues.

Process for Identifying Material Issues



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

	Materiality	FY2020 Targets / Key Performance Indicators (KPIs)	Degree of target achievement	Aspirations (FY2025)
Environment	Helping to fight global warming <p>▶ p.16, 28</p>	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) A	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>▶ p.26, 30</p>	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 B A B	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
	Preventing accidents and preparing for disasters <p>▶ p.34, 41</p>	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 B A A A	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>▶ p.18</p>	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 A A	Expand the development of products and technologies that help to resolve social issues, focusing on the SDGs
	Managing chemical substances <p>▶ p.33</p>	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 A A A	Continue to strengthen chemicals management
Society	Engaging with local communities <p>▶ p.20, 36</p>	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 business A A A A	Harmoniously co-exist and cooperate with communities Contribute to communities
	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 A	Survey and manage supply chains based on CSR procurement guidelines
	Developing human resources <p>▶ p.38</p>	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 Establish human resources development practice that links goals and feedback	A A A	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>▶ p.38</p>	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 equality Parenting/nursing care leaves B B A A A	Promote diversity and inclusion Employ persons with disabilities Promote work-life balance 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.

Creating a Low-Carbon, Recycling Oriented Society

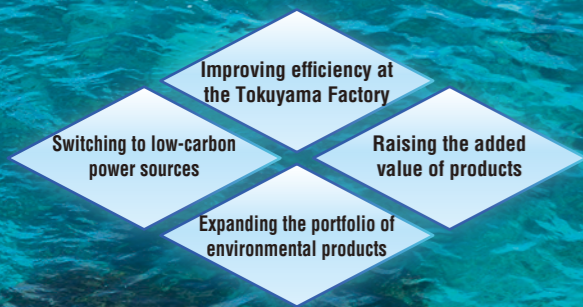


Material issue: **Helping to fight global warming; conserving the environment**

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

Vision for 2050
Pursuing a low-carbon business model

Realigning the business portfolio



Toward 2030

Target Reduce BAU CO₂ emissions from energy consumption by **15%** by fiscal 2030, from fiscal 2013 levels

Action Strategy

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

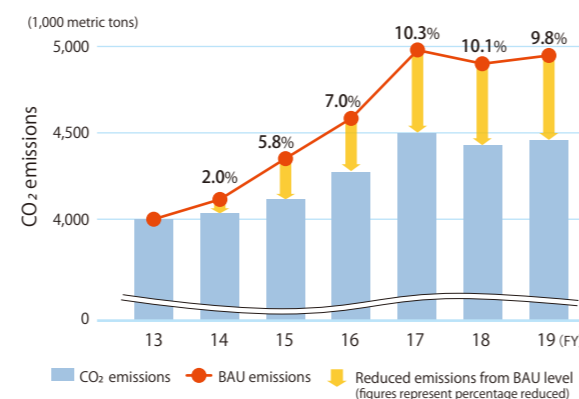
Identify the strengths of the Tokuyama Group's products relative to rising energy costs, and increase the added value of products

Toward a 15% Reduction of CO₂ Emissions from BAU Level

Most of the electricity consumed by the Tokuyama Factory is generated from private coal-fired power plants, making it a pressing issue for Tokuyama to reduce CO₂ emissions. Accordingly, the Company has designated that its most important material issue is to address global warming. In addition to implementing energy conservation initiatives based on per-unit energy consumption, Tokuyama is focusing on reducing CO₂ emissions from energy consumption. The Company is accelerating its initiatives to address global warming, with a target of achieving a 15% reduction of emissions from BAU level by fiscal 2030, compared with fiscal 2013 levels.

The entire Tokuyama Group is striving to achieve the fiscal 2030 emissions reduction target. The Tokuyama Factory comprehensively implements energy conservation initiatives to eliminate loss of available energy, and is also looking at heat recovery and utilization. In addition, Tokuyama conducts carbon recycling initiatives such as recovering and collecting and re-utilizing emitted CO₂. R&D departments are studying the development of

Reduction of BAU CO₂ Emissions



Optimizing energy efficiency at the Tokuyama Factory

In addition to implementing energy conservation measures at each plant within the Tokuyama Factory, the overall energy efficiency of the Tokuyama Factory is being improved through energy interchange between plants and by supplying thermal heat and energy to external users.

Developing new technologies

CO₂ recovery and reuse

Collaborating with universities and other external research institutions to develop technology to recover and utilize CO₂ generated by the Tokuyama Factory.

Initiatives to Reduce CO₂ Emissions

Adopting renewable energy

Biomass co-firing

Increasing biomass use at Tokuyama's private power plants, to reduce fossil fuel consumption.

Energy mix

Establishing scenarios for future environmental administration and energy situations, and studying the energy mix for manufacturing plants in fiscal 2030.

Manufacturing hydrogen using renewable power

Developing hydrogen manufacturing facilities that use the variable supply of electricity from large-scale renewable energy projects through the development and demonstration of commercial-scale electrolyzers and electrolyzing processes.

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.

Launch of CO₂ Project Group

Tokuyama launched the CO₂ Project Group in January 2020 to implement the above measures to achieve CO₂ emissions reduction targets.

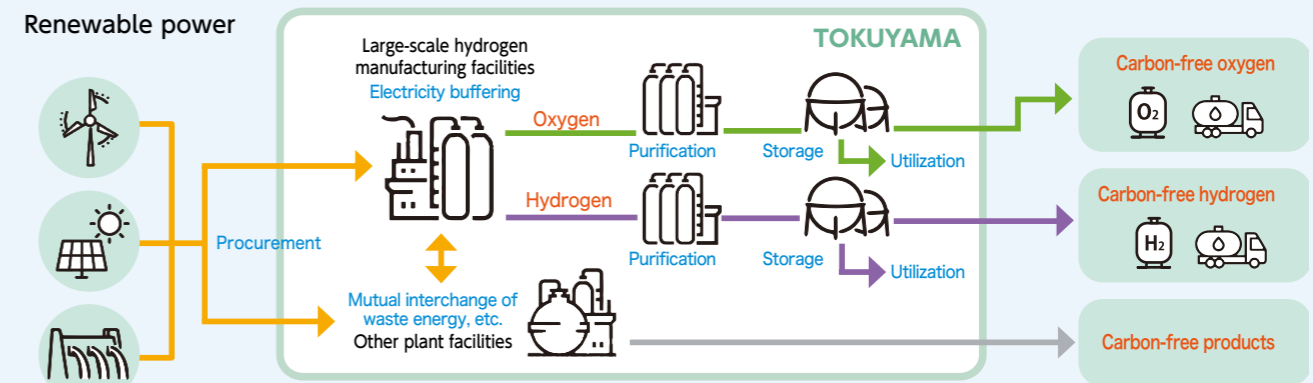
Spotlight

Demonstrating Large-Scale Hydrogen Manufacturing Using Renewable Power

The major challenges when it comes to stable, large-scale use of renewable energy are variable electricity generation due to weather conditions and other factors, and energy storage. Tokuyama has been doing research on the storage and utilization of hydrogen manufactured from renewable power through water electrolysis. In June 2019, Tokuyama

initiated development and demonstration of hydrogen manufacturing facilities using the variable electricity supply from large-scale renewable energy projects. This enables large-scale manufacturing of carbon-free hydrogen at a low cost, while significantly reducing CO₂ emissions. Throughout, Tokuyama is developing large-scale water electrolysis equipment that buffers the variable electricity supply from renewable power, as well as gas purification facilities for hydrogen and oxygen utilization. Tokuyama is also building systems for waste energy interchange among plants to realize cost reductions.

Renewable power



Tokuyama's Environmentally Friendly Products

In addition to taking steps to conserve energy and reduce CO₂ emissions in its business activities, Tokuyama develops and manufactures products that help to reduce use of environmentally harmful substances and generation of waste, utilizing life cycle assessments (LCAs).*

*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.

Nitride Ceramics: Better Thermal Management for Advanced Semiconductors



Demand is growing for power semiconductors used in control of electric vehicles, factory automation equipment, and IT equipment. Thermal management is the key as higher performance power semiconductors

are developed. Tokuyama manufactures aluminum nitride filler for use as a thermal management material in semiconductors. It delivers nine-times better thermal conductivity than conventional materials. Using aluminum nitride filler in semiconductors helps to reduce the power consumption of equipment that uses them.

Polyolefin Films: Formulated with Plant-Based Polyethylene



Most plastic films that are used for wrapping, mainly in food wrapping, are made from fossil fuel. Biomass plastics made from plant-based feedstocks are carbon neutral because plants absorb and store atmospheric carbon through light synthesis, which offsets the carbon that is released

upon incineration of the material. Group company SunTox Co., Ltd. has rapidly moved to supply polyolefin films that are partially formulated with biomass plastics, helping with the SDGs and meeting customer needs.



Polyvinyl Chloride: An Environmentally Friendly Material



About 60% of the material used to make polyvinyl chloride (PVC) is derived from salt. PVC is known for its long life and excellent recyclability. Group company Shin Dai-ichi Vinyl Corporation manufactures and markets PVC used in diverse applications such as building materials, electric wire sheaths, interior materials, medical supplies, and daily goods. PVC manufacturing and processing requires little



energy consumption and emits low amounts of CO₂, NO_x, and SO_x. Combined with PVC's excellent durability, corrosion resistance, and recyclability, this helps to conserve resources and reduce energy consumption.

PVC Windows: Better Thermal Performance to Lower CO₂ Emissions



Life-cycle carbon minus homes will require better thermal performance and airtightness than conventional homes. Windows are less thermally efficient than walls, and the use of vinyl windows can offer improved thermal performance. Group company Excel Shanon Corporation manufactures

high-performance vinyl windows that are more thermally efficient than normal aluminum windows. The use of vinyl windows helps to reduce electricity consumption from cooling and heating, which significantly reduces CO₂ emissions.

*When comparing an Excel Shanon high-performance Triple Shanon IIX triple-paned vinyl window (thermal transmittance of 0.94 W/(m²·K)) to a typical single-paned aluminum window (thermal transmittance of 6.51 W/(m²·K)), the vinyl window lets 85% less heat escape. The thermal transmittance of an aluminum window is taken from the published value for the thermal conductance of an opening, for use in calculating the thermal loss coefficient for residential energy conservation standards. The thermal transmittance of a Triple Shanon IIX window is calculated in accordance with JIS A2102-1 and A2102-2.

Recycling Incineration Ash, Soil, and Sludge at a Cement Factory



Tokuyama's Nanyo Plant annually accepts 30,000 tonnes of trash incineration ash that has been processed for recycling, a volume that is equivalent to 3,000 loads from a large 10-tonne dump truck. The plant also accepts construction-generated modified soil and hard-to-process sewage sludge for use as a biomass fuel. Used in place of coal, biomass fuel reduces CO₂ emissions and helps local governments deal with trash issues.

Concrete Paving: Low Cost, Long Life, and Improved Fuel Economy for Large Vehicles



There is growing recognition of the advantages of using concrete as a road paving material in reducing environmental impact and streamlining maintenance management. While asphalt is used in 90% of road paving applications, concrete has a long life of 50 years, which significantly reduces replacement costs and environmental impact. Concrete road paving also helps to improve the fuel economy of large vehicles by from 0.8 to 4.8%* and reduces road surface temperatures by as much as 10°C,* helping to mitigate the heat island effect. Tokuyama was involved in developing 1 Day Pave paving material that cures within 24 hours of installation. Tokuyama Group companies provide



installation services for 1 Day Pave in seeking to increase adoption.

*Source: Japan Cement Association research

Modal Shift to Reduce CO₂ Emissions



Tokuyama is building logistics systems that are better for the environment and people by implementing a modal shift to marine or rail transport, away from the trucking of freight. In December 2019, Tokuyama pledged its support for the White Logistics Movement sponsored by three Japanese ministries.* Under the initiative, Tokuyama has pledged to take voluntary action on 11 items. In March 2020, Tokuyama was certified by the Railway Freight Association to display the Eco Rail Mark reserved for companies that implement a modal shift to rail transport.

*Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Ministry of Economy, Trade and Industry (METI), and Ministry of Agriculture, Forestry and Fisheries (MAFF)



Eco Rail Mark for Tokuyama Corporation

Spotlight

Tokuyama Wins Chairman's Award from Life Cycle Assessment Society of Japan

Tokuyama and Group company Tokuyama Chiyoda Gypsum Co., Ltd. jointly received a Chairman's Award at the 16th Awards of the Life Cycle Assessment Society of Japan for the development of recrystallization technology that enables 100% recycling of waste gypsum board. Gypsum board is used in the interior walls and ceilings of buildings, and the resulting waste is mostly destined for landfills. The development of gypsum board recrystallization technology has achieved the world's first 100% board-to-board recycling of waste gypsum board.

Working with Communities for Circular and Symbiotic Socioeconomic Development



Material issue: **Engaging with local communities**

Tokuyama actively pursues dialogue to foster communication with diverse stakeholders so that it can continuously work with society to realize a sustainable future.



In February 2020, Tokuyama held the Shin-Taketori Monogatari at Tokuyama Station, an event named after the Japanese folktale *The Tale of the Bamboo Cutter*, in order to raise awareness of the SDGs through bamboo. We asked several persons who were involved in the event for their opinions about Tokuyama's efforts to foster the circular and symbiotic use of bamboo, a practical material in daily life, in the community.

Q: What is your relationship to Tokuyama, and how did you get involved in the event?

Nakamura: From my high school, many students went on to join Tokuyama and are now working there. I teach a course on industrial chemistry, and I have used the knowledge gained in visits to the Tokuyama Factory to teach the basics of manufacturing technologies.

Tazawa: My company offers products made from untapped bamboo resources in order to help build a sustainable society. Tokuyama was organizing this event to showcase effective uses for locally grown bamboo under its Tokuyama Challenge program (see Spotlight). The company asked me to produce the event.

Iida: I got involved with the event because I was interested in seeing how Tokuyama could expand the possibilities for using bamboo.

Shigenaga: I was previously involved in a study group at the Tokuyama Chamber of Commerce to examine potential uses for local idle land. It was part

Tokuyama's corporate mascot character Tanusuke

Stakeholder Dialogue Participants

Keiko Iida

President of Taishokan Y.K., which operates a traditional Japanese inn as well as a cafe and gallery in Shunan City. For the event, Iida developed desserts featuring bamboo and served as a coordinator for high school student volunteers.

Hiroaki Nakamura

Instructor for Environmental Systems at the Tokuyama Commercial and Technical High School of Yamaguchi Prefecture. Nakamura is also in charge of the school's baseball club, whose members volunteered their time for the event. Nakamura is a member of the Yamaguchi District Forum on Chemical Engineering.

Masashi Shigenaga

First-class architect and representative of Shigenaga Masashi Urban & Architecture Planning Office. Shigenaga designed the bamboo wall structures for the event.

Kashin Sato

Chair of Yamaguchi Prefecture Branch of Sogetsu Foundation and Director of Hikari City Traditional Culture and Etiquette School. Sato also teaches tea ceremony and flower arrangement at elementary and senior high schools.

Etsuko Tazawa

President of Ethical Bamboo K.K., which develops, manufactures, and sells products made from untapped bamboo resources. Tazawa was the overall promoter for the bamboo-themed event.

of the Tokuyama Challenge initiative and got me involved with Tokuyama.

Sato: I got involved with the company so that Tokuyama and the Sogetsu Foundation could collaborate on a project under the Virtual Hollywood Council.*

Nakamura: My school's baseball club is active in

volunteering, which is also good for the mental attitude of the players. We heard that the event needed a lot of bamboo, so we agreed to help by cutting down bamboo. It was also good exercise for our players.

*Virtual Hollywood Council is an entity whose member corporations and organizations leverage cross-industry and individual diversity to create new value that inspires customers and society.

Spotlight

Tokuyama Organizes Bamboo-Themed Event as Part of Community Cultural Festival

Tokuyama organized an event called Shin-Taketori Monogatari at Tokuyama Station as part of the Shunan Kisaragi Cultural Festival that was held in Shunan City in February 2020. The event grew out of a project seeking to find ways of removing obstacles to the industrial use of bamboo resources, by a team working under the Tokuyama Challenge program. With invasive bamboo causing harmful effects on the local ecosystem, the event was designed to provide a visual and auditory experience highlighting the diverse ways bamboo can be used, and also to explore potential new uses.

Local high school students harvested some 2,000 stalks of bamboo, which was used to build the gate and in original artworks and flower arrangements. The program also included a bamboo-themed, hands-on chemistry lab for children. Some 66,000 people attended the six-day event. The bamboo from the event is being repurposed to conduct incineration tests at Tokuyama's private power plants in the effort to commercialize the use of bamboo-based biomass fuel for electricity generation.



Bamboo gate made using bamboo harvested by high school students

The Tokuyama Challenge program endeavors to transform the corporate culture through projects that cut across department lines. Under the program, employees team up to propose projects that enhance Tokuyama's corporate value, driven by their own interests and ambitions.



A More Approachable Company

Q: Did your perception of Tokuyama change with your involvement in this event?

Nakamura: I had thought of Tokuyama as being a reliable but somewhat closed company. Now I see it as a company that is open to the community.

Iida: I think of Tokuyama as a reliable and honest company with diligent employees, but not good at promoting itself. It's unfortunate that more Shunan residents are not aware that Tokuyama supplies excess power from its industrial complex, to partially power our train stations and city hall.

Sato: Tokuyama seemed just like a large corporation in the Shunan industrial complex, but I feel an affinity with it now. The event name was clever.



Etsuko Tazawa

Tazawa: Tokuyama strikes me as being a company with great possibilities for the future. Many of its employees helped out with the event, and I was impressed by the company's solidarity.

Shigenaga: I can see the Tokuyama Factory from my office near

Tokuyama Port, and seeing it every day made me feel very close to the company. It seems to be a company that cares about the local community, despite being a large corporation.

Important to Develop Businesses from Solutions

Q: What is your assessment of the event?

Sato: It is great to see the entire company united around coexisting with nature. We created a large



Kashin Sato

bamboo installation piece for the event, inspired by the event theme of "Chemical Reactions from Bamboo." The piece was displayed on the second floor deck of Tokuyama Station to the delight of many local residents.

The company was very helpful in procuring the bamboo. We are happy to have helped with this event, which spotlighted the social issue of bamboo utilization.

Q: There was also a flower arrangement that was displayed in the city library, which used Tokuyama's NF Sheet.

Sato: I had never heard about NF Sheet before. It is an innovative product that allows air and moisture to pass through but repels water.

Shigenaga: The event had an impact on the community, as a completely new event held in central Shunan City. Although it was a success, many Shunan residents merely saw it as an event about bamboo. Few people got the connection between Tokuyama, bamboo, and incineration tests.

Q: It's hard to get that across with just one event.

Shigenaga: When people later hear on the news that Tokuyama has commercialized the use of bamboo for biomass power generation, they will realize what the event was about and gain a renewed appreciation of it. I sincerely hope that Tokuyama can make this happen.



Masashi Shigenaga

Iida: I said that the company was not good at promoting itself, but commercializing the bamboo biomass power generation could do a lot to promote the company. In addition to reducing CO₂ emissions by using bamboo, it would create a positive cycle for people in different situations.

Q: I understand that the event was an environmental learning opportunity for the students of Tokuyama Commercial and Technical High School.

Nakamura: Yes. By working together and seeing many Shunan residents enjoy the pieces displayed around Tokuyama Station, the students gained a true sense of the inputs, outputs, and outcomes.



Hiroaki Nakamura

Sato: I teach flower arranging at various schools. I am impressed that Tokuyama is working with local high school students. I believe harvesting bamboo allowed the students to learn about the damage caused by invasive bamboo and the environmental issues of bamboo, while also feeling the fun of working together to accomplish a task.

Looking to Tokuyama for Leadership in Achieving a Circular and Symbiotic Community

Q: Do you have any expectations for Tokuyama in the future?

Nakamura: I hope that Tokuyama will create opportunities for its young employees to interact with high school students, and also open its Technical Education and Training Center to students. Their ideas and perspectives can offer hints on the SDGs. I also hope that Tokuyama's young employees will use their abilities to communicate with the community.

Tazawa: I hope Tokuyama develops and makes products that use bamboo. It would be great if Tokuyama established a demonstration forest in Shunan City to show how a beautiful forest can be maintained and regenerated by sustainable bamboo use.

Sato: I hope to see Tokuyama address the 4Rs (reduce, reuse, recycle, repair) and pursue everything from development through to recycling. I hope it will become a leader for using the power of chemicals to conserve air, water, and soil.

Shigenaga: Vibrant cities have local companies with strong ties to diverse stakeholders like governments and city residents. I think that Tokuyama will raise its corporate value by engaging the whole community, to enrich the area and attract talented human resources.

Iida: The COVID-19 pandemic has slowed economic activity, resulting in cleaner air and water. While my company is small, I will run it with an even greater emphasis on the environment, instead of prioritizing immediate profits. I hope that Tokuyama will display leadership to ensure that the skies and ocean visible from the Tokuyama Factory remain clear.



Keiko Iida

Nakamura: I hope that Tokuyama will be a key regional company with deep community roots, which contributes to the advancement of communities. I also hope it will play a central role in building invigorated communities that are optimistic, enjoyable, and energetic, through everyone's efforts.

Thank you for your valuable opinions. We will try to meet your expectations as we work to build a circular and symbiotic community and help to achieve the SDGs.

Tokuyama's Responsible Care



Practicing 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.

*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.

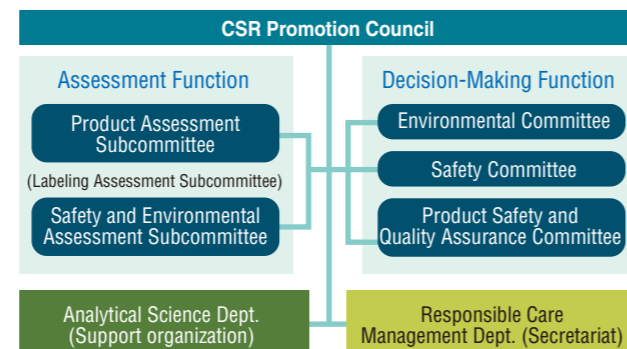
Responsible Care Initiatives

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).

Responsible Care Promotion Structure

The CSR Promotion Council is chaired by the President 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



This laboratory carries out environmental measurements, working environment measurements and ultra-trace analysis of substances under regulation and chemical pollutants.

This department promotes RC activities throughout the Group, covering the areas of the environment, safety and quality.

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

1. Promote environmental protection

- Implement an ISO 14001-based Environmental Management System and reduce environmental impact

2. Observe the laws and regulations

- Observe international rules, domestic laws and regulations and industrial standards
- Thoroughly implement export management rules on materials under control

3. Promote energy conservation and curb global warming

- Achieve top-class unit energy consumption in the industry for each product

4. 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

5. 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

6. 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

7. 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 2019

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 regulatory limits set by prefectural ordinance (see page 26) No environmental accidents Reduced or maintained levels of emissions of substances of concern Reduced per-unit energy consumption (KPI: 3% improvement compared with FY2005 levels) 9% improvement compared with FY2005 levels Zero emissions to landfills (KPI: Maintain 99.9% reuse/recycling rate) Zero emissions of industrial waste to landfills: 99.8% reuse/recycling rate 	B A A A B
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"> Achieved zero legal violations Zero accidents Employees: 1 accident requiring work absence, 2 accidents not requiring work absence Contractors: 2 accidents requiring work absence Improved safety management level Identified and reduced/eliminated hazards Promoted risk and hazard management Promoted physical and mental health 	A A B B A A A A
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 and outside of Japan 	A A A
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 	A A A
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. Appropriately addressed regulations on chemicals in countries outside Japan 	A A A

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

Tokuyama's Environmental Management



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

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.

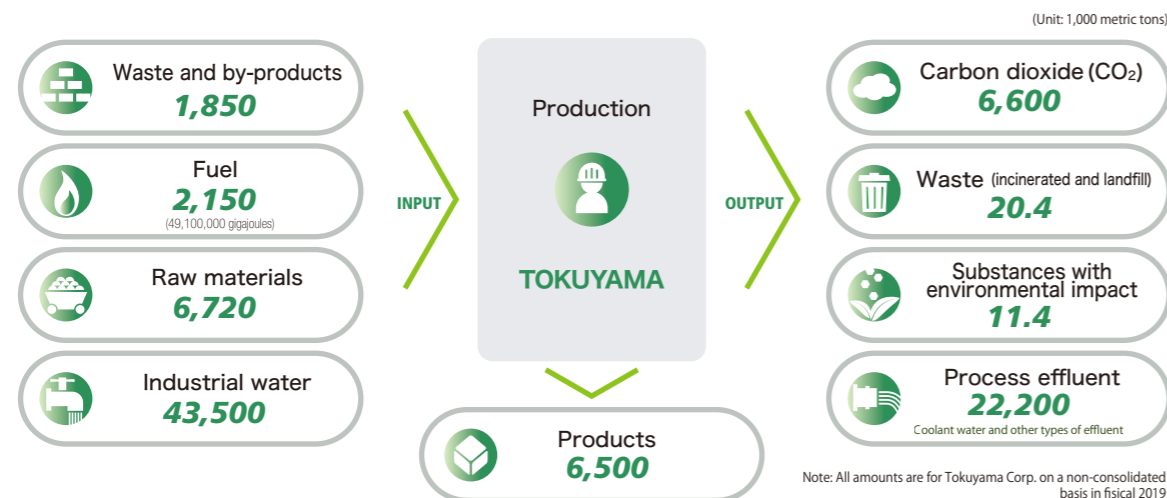
Performance in Fiscal 2019

Tokuyama works to accurately determine the input and output of materials in its operations and regularly sets new targets for reducing environmental impact.

In fiscal 2019, Tokuyama achieved its targets for per-unit energy consumption and effective utilization rate of waste.

Regarding other performance data, Tokuyama has set a separate numerical management target for each department to maintain the current low-impact situation. In fiscal 2019, there was one incident exceeding regulatory limits set by prefectural ordinance for atmospheric emissions. The cause was investigated and dealt with appropriately, including improvement of inspection methods.

Flow of Materials in Business Activities



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

The breakdown of main environmental investments was: global environmental conservation (37%), pollution control (33%), and resource recycling (29%). The main investments in fiscal 2019 included expansion and upgrading of equipment for reducing



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

Company-Wide Environmental Management Policy

Medium-Term Basic Policy	Focus Items in Fiscal 2020
<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 Take action to achieve FY2030 GHG target • Expand communication with stakeholders and improve information disclosure

CO₂, the upgrading of waste disposal equipment, and the construction of waste warehouses. The breakdown of main costs was: pollution control (66%), resource recycling (20%), and global environmental conservation (7%).

■ Economic Benefits of Environmental Management

Economic benefits account for the gains on reduction in energy consumption, the gains on sale of valuable waste, and the substantial effect of gains on reduction in disposal costs as well as raw material and fuel costs through waste recycling. In fiscal 2019, the economic benefits remained flat year on year, at approximately 1.35 billion yen.

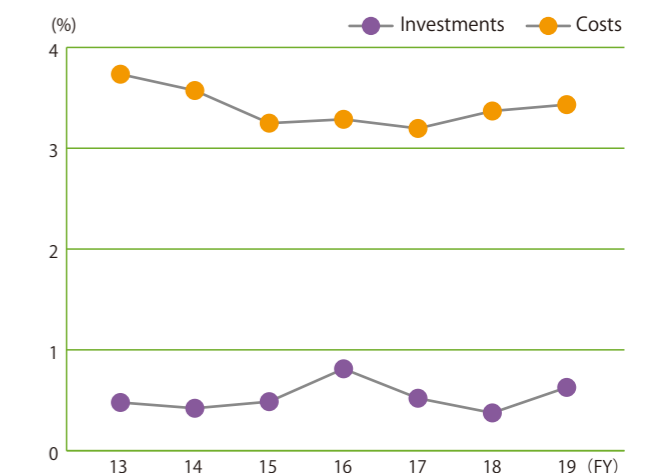
Economic Benefits in Fiscal 2019

Category	Material Benefit (1,000 metric tons)	Economic Benefit (million yen)
Gains on Reduction in Energy Consumption	—	177
Gains on Sale of Valuable Waste	85	199
Gains on Reduction in Waste Disposal Costs through Waste Recycling	221	577
Gains on Reduction in Raw Material and Fuel Costs through Waste Recycling	222	403
Total	—	1,356

Fiscal 2019 Environmental Conservation Costs

Category	Major Activities	Amount Invested (million yen)	Costs (million yen)
Costs in Business Areas	Pollution Control	393	4,264
	Global Environmental Conservation	439	472
	Resource Recycling	341	1,314
Upstream and Downstream Costs		0	3
Management Activity Costs	Installation and upgrade of equipment for environmental monitoring and analysis	10	258
Research and Development Costs		4	0
Social Activity Costs	Greenification and beautification measures Production of CSR report	0	79
Costs for Environmental Damage	Imposition, management of a former mining site	0	108
Total		1,188	6,497

Change in Environmental Accounting (Ratio to Sales)



Tokuyama endorses Nippon Keidanren's (Japan Business Federation) Declaration on Biodiversity and is a member of the Japan Business and Biodiversity Partnership. Learn about Tokuyama's business activities and their impact on biodiversity at: <https://www.tokuyama.co.jp/eng/csr/>

Helping to Fight Global Warming



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

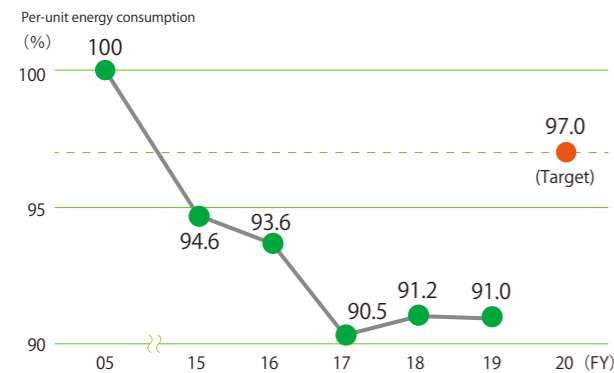
Global warming is a critical issue, and Tokuyama is helping to mitigate it by conserving energy used in its business activities, developing and manufacturing products that help to reduce GHG emissions and managing Scope 3 emissions.

Promoting Energy Conservation

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

Tokuyama sees its efforts in the fight against global warming as critical and is therefore working to reduce CO₂ emissions. Specifically, the Company has achieved the target of reducing its per-unit energy consumption by 3.0% by fiscal 2020, from fiscal 2005 levels. It is also preparing to reduce CO₂ emissions even further with projects to improve per-unit energy consumption.

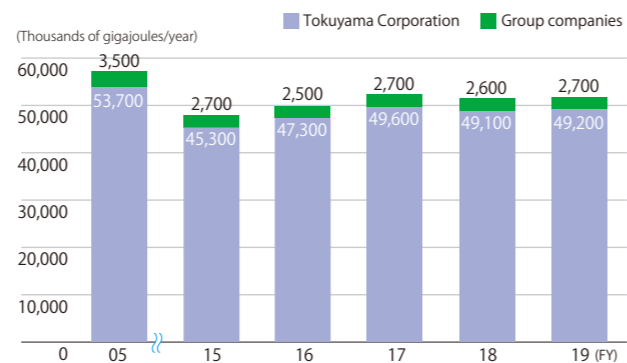
Unit Energy Consumption Index*



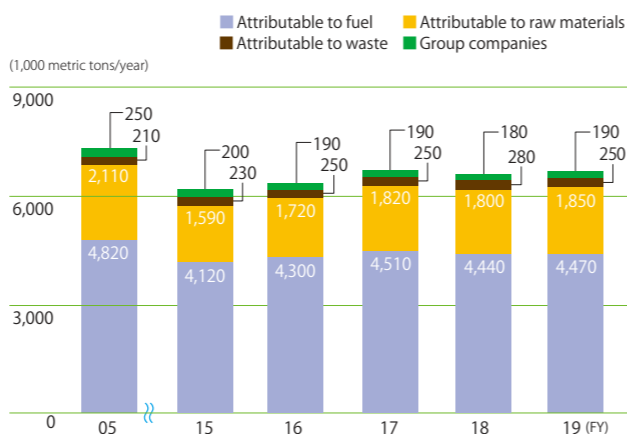
*The unit energy consumption index is calculated using a method recommended by the Japan Chemical Industry Association (JCIA).

In fiscal 2019, the energy consumption rate was down by 9.0% compared with fiscal 2005 levels, due to energy conservation measures and utilization of non-coal energy sources.

Energy Consumption



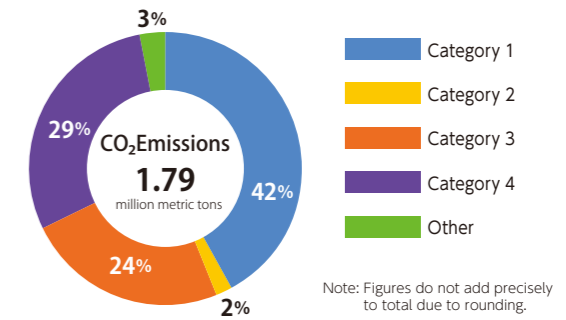
CO₂ Emissions



Calculating and Managing Supply Chain Emissions

Based on the Scope 3 Standard of the GHG Protocol,* Tokuyama accounts for supply chain emissions for Category 1 through 7 and Category 9 emissions under Scope 3. The emissions from these categories were calculated at 1.79 million metric tons, an increase of 0.32 million metric tons from fiscal 2018. This was due to changes in the Emissions Unit Database used in the calculation, resulting in an increase in category three emissions of 0.33 million metric tons. The amount of activity itself was nearly the same as in fiscal 2018. (Emissions = Activity Amount × Emissions Unit)

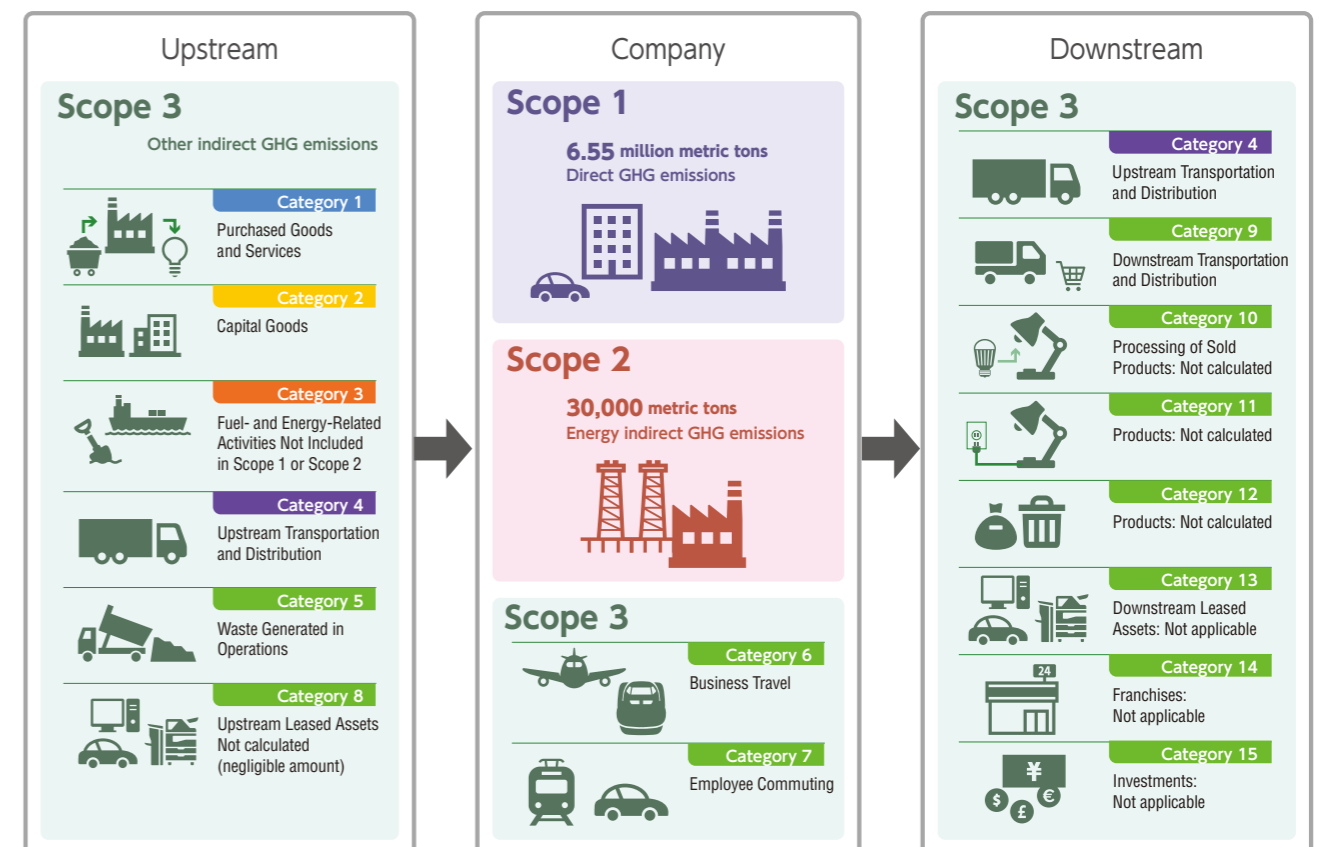
*The Greenhouse Gas Protocol (GHG Protocol) was jointly formulated by the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), and the Scope 3 Standard was issued in November 2011 as a standard for calculating CO₂ emissions throughout supply chains.



Guidelines: *Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain (Ver. 3.0)*, March 2020, 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. 3.0), March 2020; LCI Database IDEA v2.3 (for calculating supply chain GHG emissions; for general use), Sustainable Management Promotion Organization, December 2019

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

Supply Chain and Scope 3 Categories



Reducing Substances with Environmental Impact and Waste



Material issue: **Conserving the environment**

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

Reducing Water and Air Pollutants

Amounts of Atmospheric Emissions

In order to reduce atmospheric pollution from sulfur oxides (SOx) and nitrogen oxides (NOx), 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 2019, SOx and NOx emissions increased slightly due to an increase in the utilization rate of relevant facilities, and soot emissions increased slightly as a share of this trend due to changes in their operational management.

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

The substances handled in fiscal 2019 included 26 substances that must be registered under Japan's Pollutant Release and Transfer Register (PRTR) law. Non-consolidated emissions of PRTR substances decreased in fiscal 2019 due to stable incineration at relevant facilities. Emissions by Group companies were nearly flat year on year.

*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

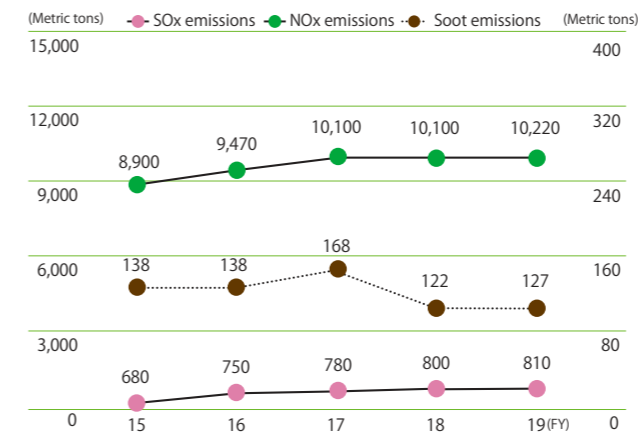
Tokuyama generates chloroethylene and three other substances that are subject to voluntary controls under Japan's Air Pollution Control Act. The Company has formulated a voluntary action plan and is working to reduce emissions of these substances.

Amounts of Industrial Effluent and Wastewater

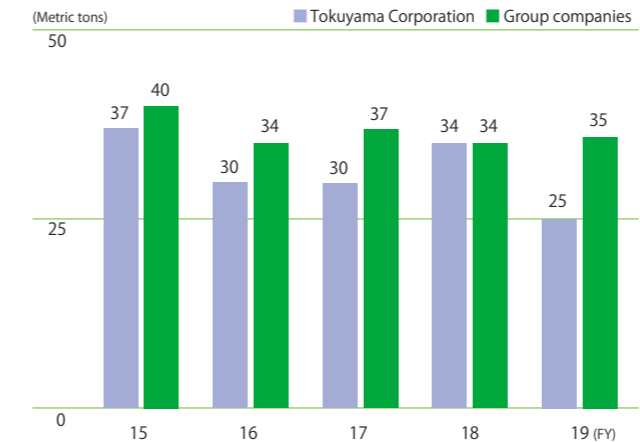
The Tokuyama Factory follows a stringent system for monitoring industrial effluent and purifying wastewater using treatment equipment in order to comply with regulatory standards and limits set by the local government, as well as the Company's own standards, which are even stricter. The factory also 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 2019, COD emissions decreased due to stable operation of wastewater treatment facilities, phosphorus emissions remained flat year on year, while nitrogen emissions increased with an increase in emissions from relevant facilities.

*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.

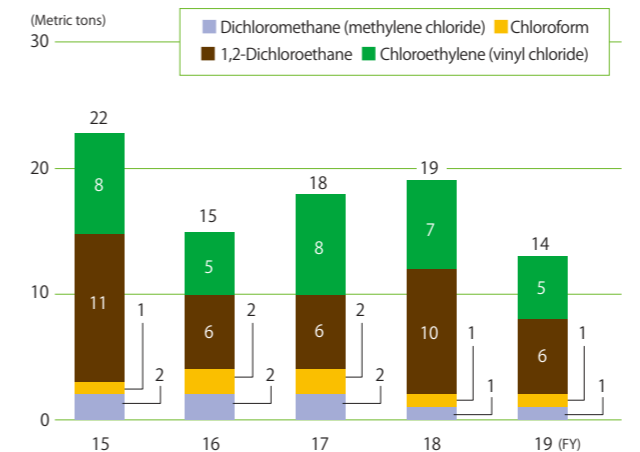
Emissions of SOx, NOx, and Soot



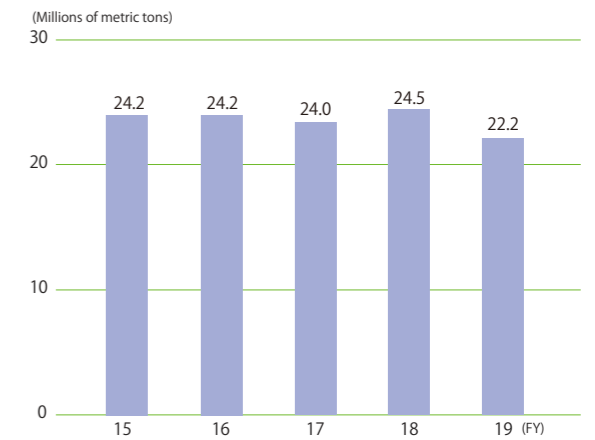
Emissions of PRTR Substances



Emissions of Hazardous Air Pollutants



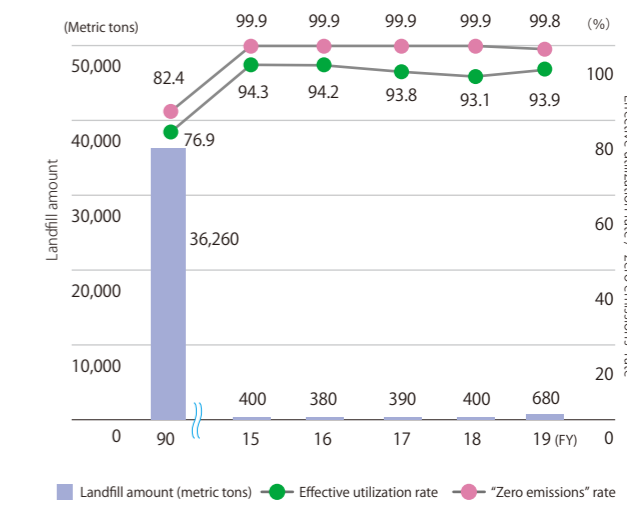
Discharge of Industrial Effluent



Water Pollutant Emissions

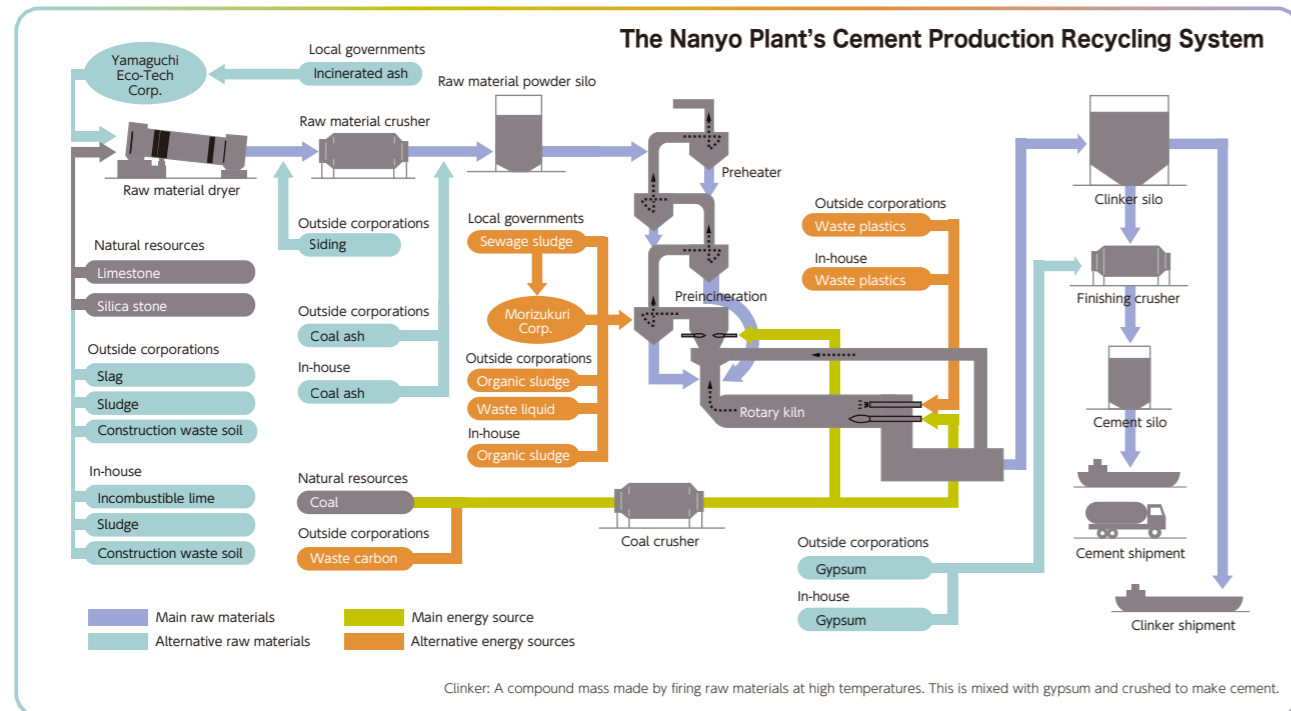
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
COD Emissions	126	116	121	129	103
Nitrogen	92	145	173	159	170
Phosphorus	2.2	2.1	2.1	2.3	1.5

Landfilled and Recycled Waste



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

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



Reducing Waste and Managing Waste Recycling

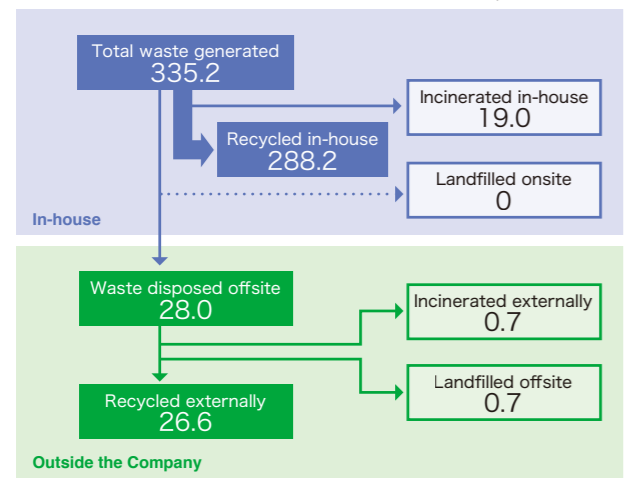
The effective utilization rate for waste and the "zero emissions" rate remained high in fiscal 2019, due to efforts to reduce the volume of waste and comprehensive recycling efforts.

Waste Management

Tokuyama generated a total of 335,000 metric tons of waste in fiscal 2019. It actively worked to recycle this waste both in and outside the Company, mainly

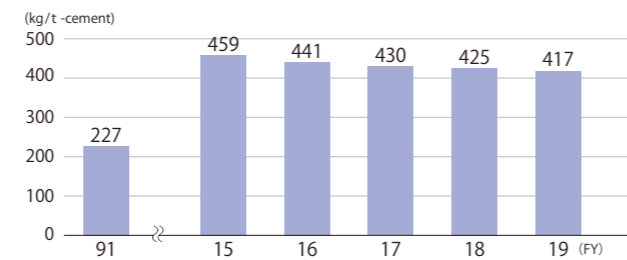
Flow of Industrial Waste Treatment

Unit: 1,000 metric tons

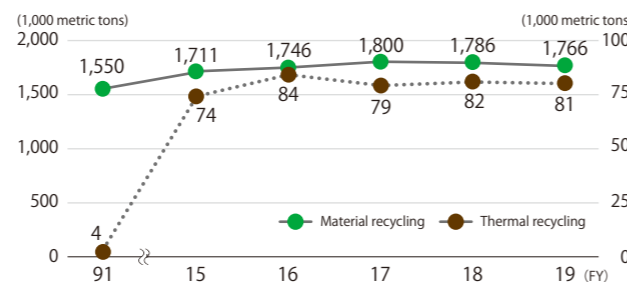


by re-using waste matter as raw materials and fuel for cement at the Tokuyama Factory. Through its diligent efforts to recycle waste as raw material for cement, Tokuyama achieved an effective utilization rate of 93.9%. Although the Company strove to reuse waste and reduce the amount generated, its landfill waste "zero emissions" was 99.8%.

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)



Chemicals and Product Safety



Material issue: **Managing chemical substances**

Tokuyama practices thorough product quality control and verifies the hazard level and toxicity of chemical substances so that they can be used with peace of mind. It also complies with chemical regulations in and outside of Japan.

Quality Management System

As an internationally competitive company, Tokuyama implements three-year quality management plans based on its Quality Policy in order to provide products and services that accurately meet the needs and expectations of its customers.

Tokuyama Quality Policy

As an internationally competitive company, Tokuyama Corporation always puts its customers first and to ensure their satisfaction, provides products and services that accurately meet their needs and expectations. To achieve these goals, the Company complies with laws and regulations and continuously improves the effectiveness of its quality management system.

ISO 9001 Quality Management System

It has been 18 years since a quality management system was introduced company-wide, including in sales and development departments, in fiscal 2002. The system is now well-established in all departments and is generating continuous improvement. An external audit by a third party in fiscal 2019 pointed out no major or minor nonconformances. Internal audits check the progress of action plans and the status of the system based on the JISQ 9001:2015 standard, requiring corrective actions for any defects. In addition to compliance with the requirements of the standard, audits also verify the effectiveness of the quality management system and whether or not it is helping to improve customer satisfaction.

Proper Management of Chemicals

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, their potential effect on human health, and the attribution of intellectual property rights.

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.

Chemical Export Control

With chemical regulations becoming increasingly rigorous worldwide, Tokuyama operates a proper chemical export control scheme encompassing Group companies, staying current on chemical regulations in each country and region, in order to avoid oversights and errors when exporting chemicals.

Accident Prevention and Occupational Health and Safety



Material issue: Preventing accidents and preparing for disasters

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.

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.

Fiscal 2020 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 2020 Tokuyama Safety Management Objectives and Key Action Items

Policy Objectives

- No compliance violations
- No accidents or accidents requiring work absence
- Reduce the rate of work absences

Improve process safety management

Renew high-pressure gas certifications, 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

Disaster Preparedness Drills

Tokuyama carries out disaster drills for pipe leaks and fires caused by an earthquake to exercise and improve information communication between the headquarters and the relevant departments and emergency procedures. The Company also conducts emergency drills at individual company divisions that encompass evening and weekend response, joint drills involving affiliated companies and contractors, and workplace safety competitions. Tokuyama also runs drills for initiating its business continuity plan (BCP) involving designating the disaster response headquarters and the crisis response headquarters in the scenario of a major earthquake.

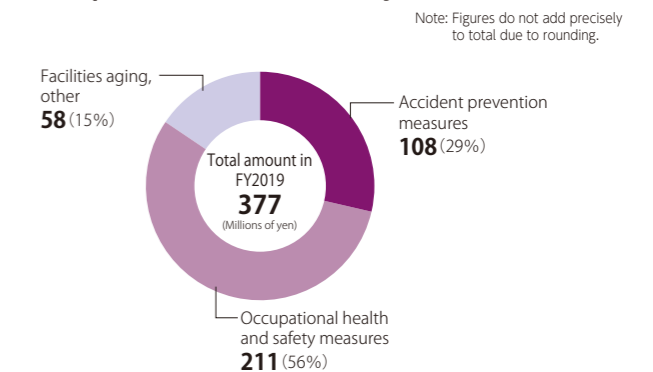


General disaster preparedness drill

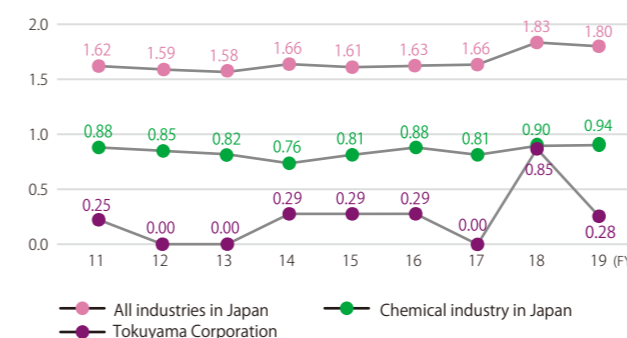
Helping Contractors Promote Health and Safety

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.

Expenditures for Accident Prevention and Occupational Health and Safety

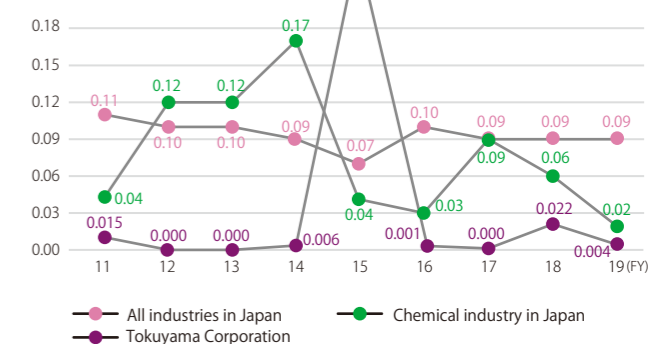


Comparison of Accident Frequency Rates*1



*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.

Communication with Stakeholders



Material issue: **Engaging with local communities**

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.

Community Cooperation and Social Contribution Activities

Supporting Youth Education for the Next Generation

The Tokuyama Factory actively supports youth education by hosting field trips of local elementary school students and visiting schools to conduct workshops for students.

The Tokuyama Factory invited Grade 3 students from four elementary schools in Shunan City (photo at left). The students learned about everyday products made from sea salt and saw the scale of the plant while learning about its facilities and safety initiatives. Tokuyama employees visited the local Tokuyama Elementary School to conduct workshops on material recycling for Grade 5 students. The Company also participated in an environmental event organized by the Hikari City government, offering a lecture on hydrogen energy for Grade 1 students of Asae Junior High School. The students



Workshop on hydrogen energy at a local school



Corporate donation to the Mikage Bunko book program

Students explore a salt mound at the Tokuyama Factory

Spotlight The Tokuyama Science Foundation

Extending Grants for New Materials Research for Over 30 Years

The Tokuyama Science Foundation was founded in 1988 to mark Tokuyama's 70th year in business. Its mission is to promote science and technology for the next generation, and it offers grants for original theoretical and applied research for new materials development.

From 1989 to 2019, the foundation granted a total of more than 899 million yen to 460 persons. The grants are in the sum of two million yen, and for researchers under 45 years of age.

Starting in fiscal 2020, the foundation is offering a one million yen start-up grant for young researchers with less than three years of experience in a research position who are also



22nd presentation of research results by grant awardees in November 2019

within 10 years of getting their degree. The foundation also offers a continuing grant of five million yen over two years, for previous grant awardees to continue their research.

The foundation also extends grants for international exchange, international symposiums, and science and technology education. It supports science education by co-sponsoring a youth chemistry fair organized by the Chugoku and Shikoku chapter of The Chemical Society of Japan. The annual fair, which began in 1993, features hands-on labs and attracts some 3,000 kids and parents.

were shown a MIRAI hydrogen car and learned about how hydrogen can be utilized to build a sustainable world.

Tokuyama has been donating book gift certificates to local schools through the Mikage Bunko book program since 1978, its 60th year in business. As of 2020, the program had donated over 211 million yen over its 43 years of operation.

Tokuyama Chemical Club Receives 2019 Chemical Communication Award

The Tokuyama Chemical Club conducts hands-on chemistry labs for kids using everyday items to communicate the wonders of chemistry and make chemistry fun. The program, which is held in several areas, received a 2019 Chemical Communication Award from the Japan Union of Chemical Science and Technology. Masahiro Takesue, club director,



Hands-on chemical lab using bamboo for chemistry students of Nanyo Technical High School, organized by Tokuyama Chemical Club



Masahiro Takesue, Director of the Tokuyama Chemical Club, receives a distinguished service award

also received a distinguished service award from the Yamaguchi Prefecture Invention Association recognizing his longtime efforts.

Tokuyama Factory Responsible Care Community Dialogue

The Tokuyama Factory organizes a Responsible Care Community Dialogue to communicate its process safety, accident prevention, and environmental conservation initiatives to local residents' associations.

The dialogue on September 20, 2019 was attended by 28 persons from 17 local residents' associations and four officials from Shunan City. The theme of this 16th dialogue was "The Everyday Preparations and Emergency Response Efforts of the Tokuyama Factory." The attendees were briefed on the plant's chemical substance use and management, emergency response, public relations activities, and accident prevention drills. They also visited the manufacturing facilities of the cement plant.

Aid for Areas Affected by Typhoon Hagibis

Tokuyama donated 10 million yen in aid to assist victims and communities affected by Typhoon Hagibis, which left a path of destruction in eastern Japan in October 2019.

Developing Talent and Promoting Diversity



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

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

Tokuyama Human Resource Development

Tokuyama's human resource development systems, including global training and Next-Generation Business Leader (NBL) training, focus on helping employees improve their abilities and interpersonal skills as free-thinking individuals. The goal is to develop high-quality talent capable of taking the initiative and exercising creativity.

Personnel System Reform

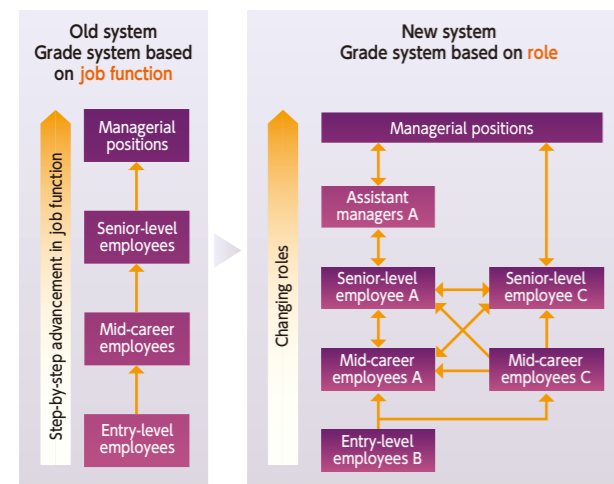
Tokuyama is reforming its personnel system to increase the work satisfaction of employees. The aim is to change the organizational culture by

encouraging adoption of the Tokuyama Vision, while ensuring that all employees receive impartial treatment under a thoroughly applied, fair evaluation system. Following system changes for managers and senior contract employees, a new personnel system was introduced for general employees in fiscal 2020.

The new system is a role-based grade system that emphasizes action. The roles and level of work expected by the Company are presented for each grade to encourage employees to take on challenges.

The new system also provides multiple career-path options accommodating a variety of work styles and job categories, such as sales, manufacturing, and R&D. The system is designed to enable early promotion based on the scope of the expected roles as well as results and actions.

Transition of Grade System from Job-Function-Based to Role-Based



Tokuyama Employees

(Tokuyama Corporation)

		FY2017	FY2018	FY2019
Number of employees	Men	1,750	1,750	1,849
	Women	170	174	214
	Total	1,920	1,924	2,063
Number of new hires [Number of mid-career hires]	Men	23 [5]	58 [10]	120 [60]
	Women	4 [0]	8 [1]	16 [7]
	Total	27 [5]	66 [11]	136 [67]
Number of rehired individuals	Single year	34	26	24
	Total	216	172	142
Average years of service	Men	21.5	20.9	19.6
	Women	18.0	17.6	15.3
	Average	21.2	20.6	19.1
Turnover rate (%)		1.3	0.9	0.7
Employment rate of people with disabilities (%)		2.0	2.0	1.9

Spotlight

Shunan Swimming Club Receives Eruboshi Certification



"Eruboshi" certification mark with three stars



Misae Aimoto, President (right), receiving the certificate

In December 2019, Shunan Swimming Club Co., Ltd. a Group company, received "Eruboshi" certification in recognition of its tremendous efforts to empower women in the workplace. "Eruboshi" certification, which is granted at three levels, is based on five criteria for evaluating whether a workplace environment emboldens women: (a) recruitment, (b) employee retention, (c) working hours and other work conditions, (d) percentage

of management positions held by women, and (e) diversity of career-path options. Shunan Swimming Club has received the highest level of certification by meeting all five criteria.

Under the new system, evaluation of how well employee behavior displays Tokuyama's four values (see page 3) has been added to the personnel evaluation criteria, in order to ensure that the personal system helps to drive achievement of the Tokuyama Vision.

Promoting Diversity

Tokuyama is promoting diversity to ensure that all employees can work with energy and succeed. Tokuyama values diversity of knowledge and intelligence and seeks to create workplaces that are pleasant and motivating, while aiming to improve productivity, by reforming the workplace culture.

While striving to promote more opportunities

for women, in fiscal 2019 Tokuyama fell short of its goals in the areas of discontinuing non-management track positions and expanding women's areas of responsibility. At the end of fiscal 2019, the Company added the goal of building more comfortable workplaces and updated the plan for two years. Tokuyama is also working to improve workplace environments for people with disabilities, aiming for the legally mandated employment rate of 2.2%. For end-of-career workers, the Company offers re-employment contracts up to the age of 65. Currently, 170 employees (approximately 7% of the workforce) are on these contracts.

Tokuyama Corporation Action Plan to Promote Opportunities for Women

Duration: April 1, 2020–March 31, 2022

Target	Target Value	Performance (March 2016)	Performance (April 2018)	Performance (April 2020)
Target 1: Percentage of women among university graduates who are hired	No less than 20% (3-year moving average)	25%	23%	19%
Target 2: Percentage of women among all assistant managers	No less than 6%	4.7%	6.0%	6.1%
Target 3: Percentage of women among all managers*1	No less than 2%	1.2%	1.5%	1.8%
Target 4: Expand women's areas of responsibility	Sales positions:*2 10 employees All production divisions:*3 20 employees	Sales positions: 4 employees All production divisions: 13 employees	Sales positions: 7 employees All production divisions: 14 employees	Sales positions: 12 employees All production divisions: 19 employees
(New) Target 5: Average usage rate of annual paid leave	No less than 75%	—	—	72.2%

*1. Including positions equivalent to managerial positions *2. Sales positions includes persons externally engaged in direct client services, such as technical sales, quality assurance, etc. *3. Excluding supervisors

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.*1 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.*2 The rate of women returning to work after prenatal/postnatal leave and childcare leave in fiscal 2019 remained at 100% from the previous year.

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

*1. 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.

*2. In certain cases, leave can be taken until the child reaches age two.

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 work, internal information is shared with them on the intranet. In addition, an employee reinstatement system has been established to allow employees who resigned for childcare or family care reasons to be rehired.

Annual Paid Leave Usage and Non-scheduled Working Hours

	FY2015	FY2016	FY2017	FY2018	FY2019
Annual paid leave, average days used	15.9 days	15.2 days	15.2 days	15.7 days	15.2 days
Annual paid leave, average usage rate	76.6%	73.6%	73.2%	75.6%	72.2%
Non-scheduled working hours average (per month)	6.3 hours	7.7 hours	8.3 hours	9.8 hours	10.3 hours

Usage of Childcare and Family Care Leave, Etc.

	FY2015	FY2016	FY2017	FY2018	FY2019
Number of employees taking childcare leave	10	13	11	12	12
Return to work rate	90.0%	84.6%	100.0%	100.0%	100.0%
Number of employees taking parental leave	18人	13人	25人	33人	65人
Family care leave-taker	1人	1人	2人	2人	1人
Number of employees taking family care time off	1人	1人	0人	1人	1人
Number of flextime users	52人	55人	54人	50人	52人

Voice))

Raising Four Children Improved My Awareness of Time Management

My first daughter was born in early April when the effects of COVID-19 were in full swing. I also have three boys in elementary school, but with their school closed, everyone ended up at home all day.

I myself had started working from home on a temporary basis at the end of March to prevent infection in the company, and so I used the time that my commute used to take to care for my kids.

I gave milk to the baby, changed her diapers, and helped the older kids with their studies. But since I hadn't helped out

Nobuyuki Kurokawa

Polysilicon Sales Dept.



much before due to work, I didn't do a very good job. Thinking about how I could be more efficient, I was reminded of the importance of time management. One of the valuable things about work-life balance is applying the lessons learned at home to work.

If the adoption of telecommuting due to COVID-19 leads to the choice to work from home in the future, I am certain that many employees, not just those raising children, would benefit.

Creating a Health-Conscious Workplace



CSR issue: **Promoting mental and physical health**

Tokuyama regards the maintenance and promotion of the health of its employees as a management issue and takes a variety of initiatives so that employees can work enthusiastically in the workplace and lead fulfilling lives at home and in the community.

Health Management at Tokuyama

Tokuyama has a company-wide health management plan designed to develop employees' mental and physical health and promote measures against lifestyle diseases. The plan has the goals of raising individual health awareness, keeping the rate of findings on health checkups at 44% or less, and reducing the rate of leave taken due to health problems. The Company is taking various actions including those described below.

■ Implementing the Smart Life Program

The Smart Life Program is tackling lifestyle diseases by encouraging employees to keep records of their weight, number of steps walked, and blood pressure on the personal health portal site My Health Web. It also offers anti-smoking help such as raising awareness of the harmfulness of smoking, reducing indoor smoking areas, and encouraging "no smoking day" during working hours on the 22nd of every month.

■ Offering Health Guidance and Fighting Lifestyle Diseases

Working with the Health Insurance Association, Tokuyama provides specific health guidance to employees in person and in emails. As a result, the 2020 health checkup showed an improvement in 44% of those who had received health guidance in the previous year. The Company will continue to conduct regular health checkups and specific

health checkups and ensure that proper health guidance is provided by industrial health staff.

■ Promoting Mental Health Care

Tokuyama aims for early detection and response to mental health issues by giving occupational stress tests to all employees, interviewing people with high levels of stress, and offering enhanced consultation services. Tokuyama Factory alone, seeking to improve the work environment through stress reduction and self-care education, held 21 mental health training sessions in 2019, and 485 people, 59% of the target, participated in the sessions.

Spotlight

Recognized for Health and Productivity Management

In March 2020, Tokuyama was recognized under the large enterprise category in the 2020 Certified Health and Productivity Management Organization Recognition Program.* Tokuyama was rated highly for its weight management and anti-smoking measures as well as its mental health care initiatives including occupational stress tests and internal/external consultation desks.



*This program recognizes corporations with outstanding initiatives in employee health management that tackle the issue strategically from a business management perspective. METI designed the program and the Nippon Kenko Kaigi administers certification.

Corporate Governance



CSR issue: **Strengthening 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.

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.

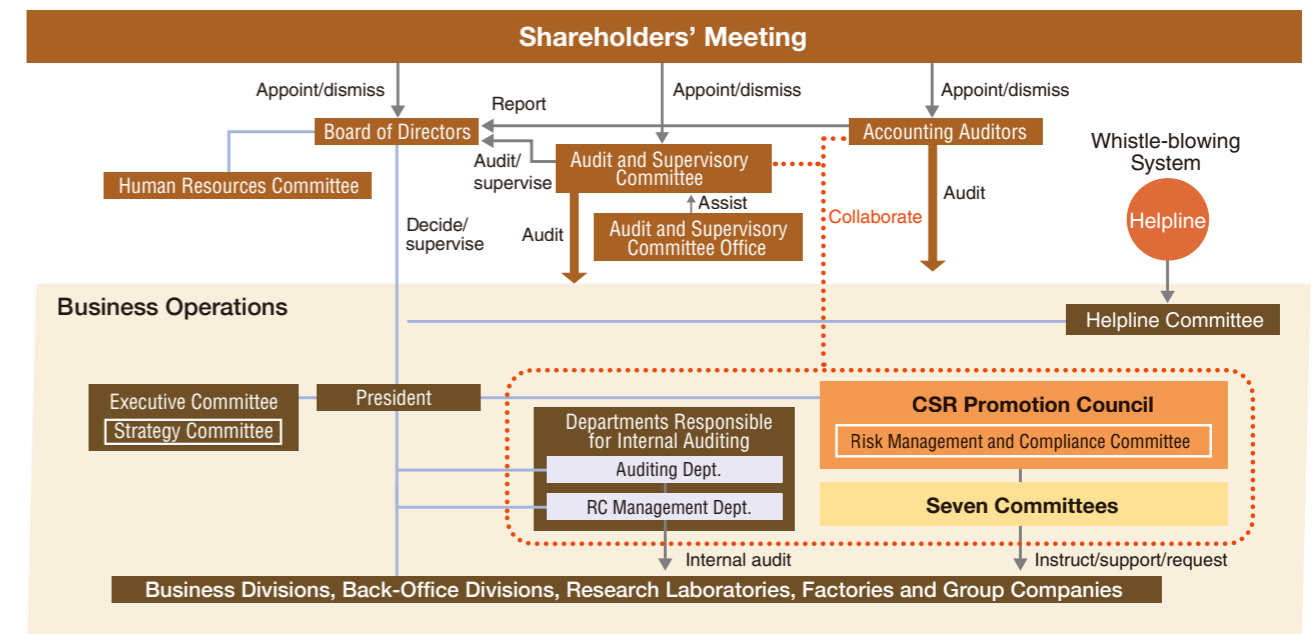
In April 2019, the criteria for selecting outside directors were revised. This enables freer choice of independent outside director candidates suitable for improving the governance of the Company, and enhances the independence and supervisory function of the Board.

■ Corporate Governance Structure

Board of Directors

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 strengthen its supervisory function.

Corporate Governance Structure



Audit and Supervisory Committee

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.

Human Resources Committee

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

Executive Committee

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.

Strategy Committee

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.

CSR Promotion Council

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 (see page 44).

Helpline Committee

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

Internal Auditing

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

Risk Management and Compliance



CSR issue: **Implementing risk management and compliance**

Tokuyama regards risk management and compliance as the two sides of the implementation of internal control. In order to deliver on its social responsibilities and ensure its business is sound and sustainable, it carries out various initiatives to strengthen risk management and ensure thorough compliance.

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 BCP and other measures in order to ensure an appropriate response for the type and severity of any crisis.

Tokuyama Group's Five Conscience Clauses

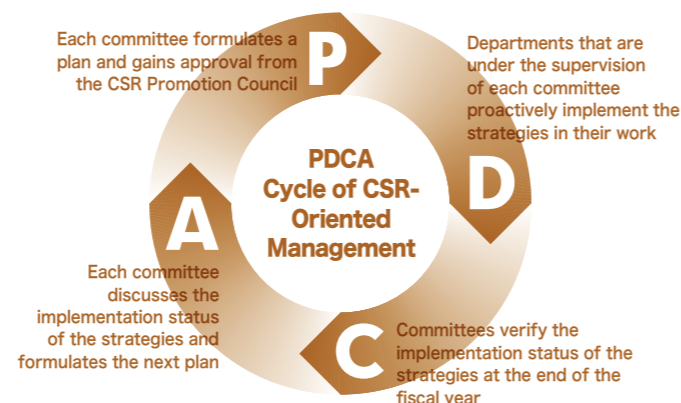
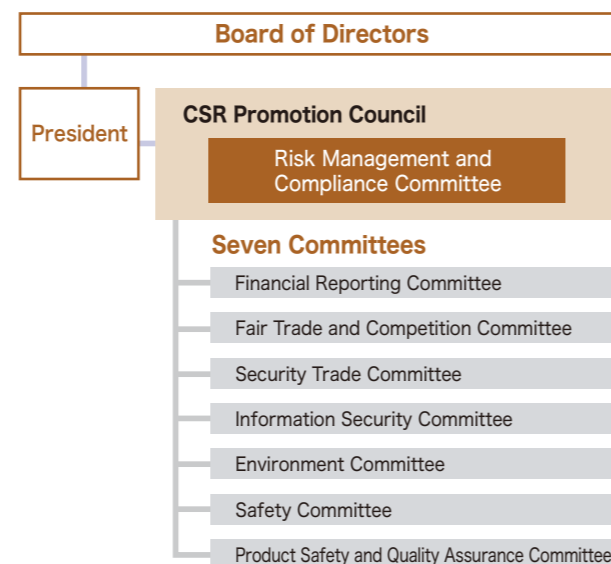
Our behavior shall:

- (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



Tokuyama Group's Five Conscience Clauses (on the back of the employee ID)

Risk Management Framework



■ Seven Committees

The following seven committees have been established under the CSR Promotion Council.

Financial Reporting Committee: This committee controls the process of preparing financial reports through accounting to ensure the reliability of financial disclosures. Members are appointed from relevant departments as well as from the business management group engaged in accounting.

Fair Trade and Competition Committee: This committee has established a company-wide system to reduce compliance risks related to fair trade, with a focus on compliance with the Antimonopoly Act. It is working to improve and raise the level of the system while monitoring its operational status.

Security Trade Committee: This committee properly implements security export controls to help maintain international peace and security. It also prevents violations of laws and regulations related to exports and other transactions.

Information Security Committee: This committee decides basic policies on, and raises awareness about, information security in general in order to promote active use and safeguarding of the Group's information assets. It also promotes the protection of personal information.

Environmental Committee: This committee deliberates and decides on environmental policies as well as plans and measures for environmental management.

Safety Committee: This committee deliberates and determines safety policies as well as safety management plans and their performance.

Product Safety and Quality Assurance Committee: This committee deliberates and determines product safety and quality policies as well as product safety and quality management action plans and their performance.

■ Promoting Information Security

Tokuyama has formulated a security policy and works hard to ensure the security of information assets such as client information. These efforts include launching an organization (CSIRT) to prevent incidents and respond instantly to minimize damage if an incident should occur. In March 2020, the account information of an employee of a Group company outside Japan was exploited and about 440 spam emails were sent with unauthorized access.

Joint BCP drill at the Tokyo Head Office



No secondary damage was confirmed. Tokuyama is working to prevent a recurrence and strengthen information security, including tighter management of accounts and passwords.

■ Business Continuity Management (BCM)

In order to keep important businesses and operations going even in unforeseen circumstances, Tokuyama practices business continuity management in normal times. This includes formulating and revising the BCP, securing budgets and resources for business continuity, and taking proactive steps to improve business continuity capabilities.

In January 2020, the Tokyo Head Office conducted a BCP drill on the premise of a mega-earthquake in the Nankai Trough. It was run jointly by the Crisis Response Headquarters headed by the President and the Disaster Response Headquarters headed by the general manager of the General Affairs and Human Resources Division.

In February 2020, Tokuyama established a Crisis Response Headquarters to address the novel coronavirus and has taken measures to ensure the safety of employees worldwide and business continuity. In Japan, it encouraged telecommuting, especially in urban areas, by flexibly applying its existing telecommuting system, and it expanded the application of its leave system to employees raising children of junior high school age and younger, to help during temporary school closures.

Compliance

Tokuyama Group 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 of Group companies and a variety of compliance training programs for employees. In 2019, these training programs were held on 57 occasions.

The Company also implemented e-learning programs for managers focused on preventing workplace harassment and covering the basics of

socially responsible management and its proactive CSR initiatives.

■ 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. Eight reports were made in 2019, and all were addressed satisfactorily.

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

- (1) While perceiving the needs of consumers and customers, the Group will develop and provide products and services that have value to society with the aim of contributing to sustainable social development.
- (2) As it responds to the globalization of business operations, the Group will respect local cultures and customs as well as the interests of the local stakeholders while complying with international and local rules, laws and regulations. In doing so, the Group will contribute to regional development in the course of its international business activities.
- (3) Each company of the Group will actively seek to engage in social contribution activities as a good corporate citizen.

2. Environmental Conservation and Protection

- (1) The Group will voluntarily address environmental issues based on a recognition of their significance to all humanity and their vital importance to the continuation of business activities.
- (2) In the course of the research, development and manufacture of its products as well as in the sale and disposal of its products and goods, including those manufactured by other companies, the Group will at all times remain fully aware of the importance of environmental protection. The Group will produce environmentally conscious products, complying with environment-related laws and regulations.

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

- (1) The Group will comply with laws and regulations relating to cartels, bid rigging, the maintenance of resale prices and abuses of dominant position. In doing so, the Group will conduct reasonable transactions by engaging in fair, free and transparent competition.
- (2) The Group will establish and comply with basic purchasing policies in order to meet the fairness and transparency of its procurement activities, including work that is consigned or contracted out.
- (3) The Group will select its trading partners not only based on economic rationality, but also after taking into account the initiative shown by these trading partners to fulfill their social responsibilities.
- (4) The Group will comply with laws and regulations related to the protection of subcontractors.

3. Entertainment and Gift Giving

- (1) When any person in the Group's employ entertains or provides gifts to customers or trading partners or is the recipient of gifts or entertainment, the value and nature of such gifts and entertainment shall not be in excess or violation of social norms or of internationally accepted conventional wisdom.
- (2) With the desire to abolish empty formalities, all persons in the Group's employ should abstain from inter-Group gift-giving as well as exchanges of gifts or other items on the individual level, except in those cases that fall within acceptable business norms.

4. Other Companies' Trade Secrets

- (1) The Group shall not, directly or indirectly, acquire other companies' trade secrets in a dishonest manner. Also, in no case shall it, directly or indirectly, use such secrets in a dishonest manner.
- (2) The Group shall not use another company's trade secrets except for purposes permitted by the said company.

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

- (1) The Group will value the diversity, character and personality of each person in its employ and will not discriminate on the basis of race, ethnic origin, gender, creed, nationality, religion, disability, disease or educational background.
- (2) The Group will have no involvement with child labor or forced labor.
- (3) The Group will allow no person in its employ to degrade individual dignity in any manner, including by speaking or acting in ways that bring discomfort to others.

2. Respect for Privacy

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

3. Compliance with Labor-Related Laws and Regulations

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

4. Workplace Safety and the Promotion of Health

- (1) The Group will strive to maintain a safe and clean working environment.
- (2) The Group will steadily take steps to prevent work-related injuries or deaths.
- (3) The Group will always pay attention to the mental and physical health conditions of the persons in its employ.

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

- (1) The Group will implement proper accounting procedures in accordance with generally accepted accounting standards. Accordingly, the Group will accurately record all transactions related to business activities and properly maintain such records.
- (2) The Group will not make any false or fictitious statements or reports of financial information.

3. Management of Confidential Information

- (1) The Group will properly manage its own confidential information in accordance with its corporate rules.
- (2) In the event the Group needs to disclose such confidential information to the outside, the Group shall ensure that prior approval has been obtained in accordance with predetermined procedures set out in its corporate rules and work to prevent the unexpected leakage of information by taking such steps as concluding non-disclosure agreements.
- (3) The Group shall handle any personal information acquired in the course of business only within the scope of its purpose of use. In cases where the Group needs to use such personal information for purposes beyond said scope, it shall obtain prior consent from the individual concerned.

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

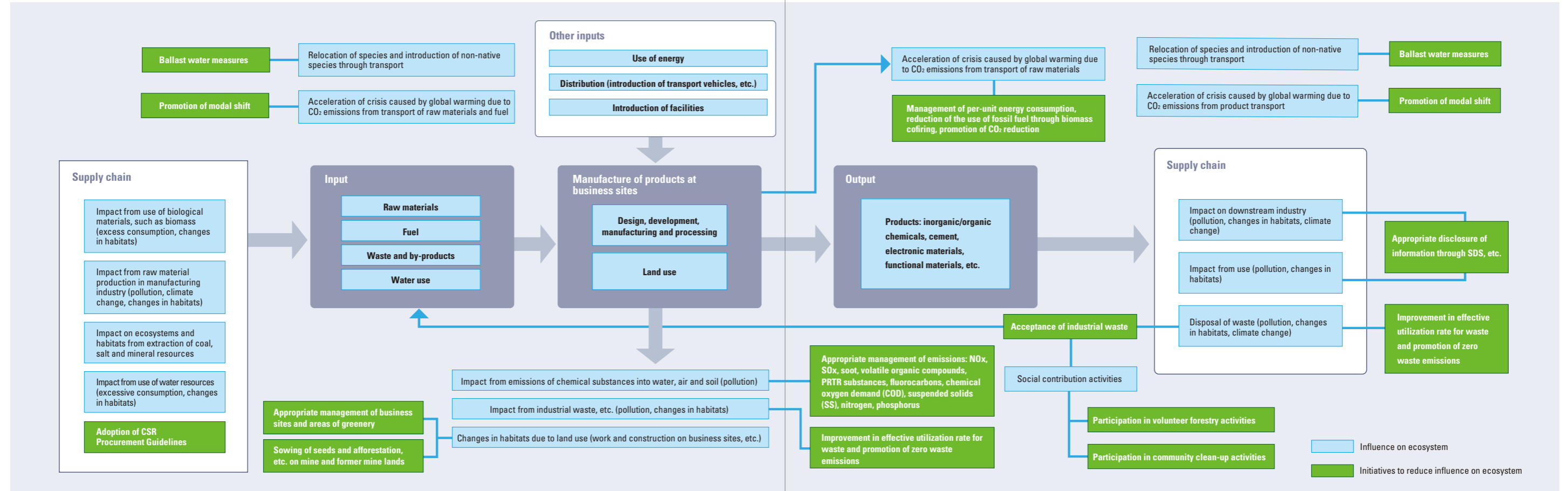
- (1) The Group will appropriately use its own intellectual property rights as important assets and work to protect and maintain such rights.
- (2) The Group will use the intellectual properties for which another party holds the rights only after concluding an appropriate agreement between the Group and said other party, and it shall not use such rights in a dishonest manner.

Supplement

Upon the prior consent of Tokuyama Corporation, Group member companies may partially amend the content of these Guidelines to reflect applicable laws and regulations as well as local cultural considerations.

Business Activities and Biodiversity / Detailed Data

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



Flow of Materials in Business Activities

Input (Unit: 1,000 metric tons)	FY2015	FY2016	FY2017	FY2018	FY2019	Comparison with previous fiscal year (%)
Waste and by-products	1,780	1,830	1,880	1,870	1,850	-1.1
Fuel	1,810	2,050	2,250	2,150	2,150	0.0
Raw materials	5,990	6,020	6,760	6,670	6,720	0.7
Industrial water	42,100	44,100	45,500	44,700	43,500	-2.7
Output (Unit: 1,000 metric tons)	FY2015	FY2016	FY2017	FY2018	FY2019	Comparison with previous fiscal year (%)
Carbon dioxide	5,910	6,000	6,300	6,500	6,600	1.5
Waste (incinerated and landfill)	22	22	21	23	20	-13.0
Substances with environmental impact	9.7	9.9	10.6	11.4	11.4	0.0
Process effluent	24,000	24,200	24,200	24,500	22,200	-9.4

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

Unit: %	Base year (FY2005)	FY2016	FY2017	FY2018	FY2019	Target (FY2020)
Per-unit energy consumption	100	93.6	90.5	91.2	91.0	97.0

Energy Consumption

Unit: 1,000 gigajoules	Base year (FY2005)	FY2015	FY2016	FY2017	FY2018	FY2019
Tokuyama Corporation	53,700	45,300	47,300	49,600	49,100	49,200
Group companies	3,500	2,700	2,500	2,700	2,600	2,700

Emissions of CO₂

Unit: 1,000 metric tons	Base year (FY2005)	FY2015	FY2016	FY2017	FY2018	FY2019
Originating from fuel	4,820	4,120	4,300	4,510	4,440	4,470
Originating from raw materials	2,110	1,590	1,720	1,820	1,800	1,850
Originating from waste matter	210	230	250	250	280	250
Group companies	250	200	190	190	180	190

Emissions of SO_x, NO_x, and Soot

Unit: Metric tons	FY2015	FY2016	FY2017	FY2018	FY2019	Comparison with previous fiscal year (%)
SO _x	680	750	780	800	810	1.3
NO _x	8,900	9,470	10,100	10,100	10,220	1.2
Soot	138	138	168	122	127	4.1

Emissions of PRTR Substances

Unit: Metric tons	FY2015	FY2016	FY2017	FY2018	FY2019	Comparison with previous fiscal year (%)
Tokuyama Corporation	37	30	30	34	25	-26.5
Group companies	40	34	37	34	35	2.9

Emissions of Hazardous Air Pollutants

Unit: Metric tons	FY2015	FY2016	FY2017	FY2018	FY2019	Comparison with previous fiscal year (%)
Dichloromethane (methylene chloride)	1.7	2.3	1.8	1.4	1.4	0.0
Chloroform	1.1	1.7	1.6	1.2	1.2	0.0
1,2-Dichloroethane	10.6	6.4	6.3	10	6.2	-38.0
Chloroethylene (vinyl chloride)	7.7	5.4	7.6	6.8	5.2	-23.5

Discharge of Industrial Effluent

Unit: million metric tons	FY2015	FY2016	FY2017	FY2018	FY2019	Comparison with previous fiscal year (%)
Industrial effluent	24.2	24.2	24	24.5	22.2	-9.4

Water Pollutant Emissions

Unit: Metric tons	FY2015	FY2016	FY2017	FY2018	FY2019	Comparison with previous fiscal year (%)
COD	126	116	121	129	103	-20.2
Nitrogen	92	145	173	159	170	6.9
Phosphorous	2.2	2.1	2.1	2.3	1.5	-34.8

Landfilled and Recycled Waste

Unit: metric tons	Base year (FY1990)	FY2015	FY2016	FY2017	FY2018	FY2019
Landfilled waste	36,260	400	380	390	400	680
Effective utilization rate (%)	76.9	94.3	94.2	93.8	93.1	93.9
"Zero emissions" rate (%)	82.4	99.9	99.9	99.9	99.9	99.8

Breakdown of Waste Treatment Methods

Unit: 1,000 metric tons	FY2015	FY2016	FY2017	FY2018	FY2019	Comparison with previous fiscal year (%)
Waste recycled in-house	346	332	317	286	288	0.7
Waste recycled externally	21.4	23.1	26.7	30.2	26.6	-11.9
Incinerated waste	21.9	21.5	22.5	23	19.7	-14.3
Waste sent to landfills	0.4	0.4	0.4	0.4	0.7	75.0
Total waste generated	389	377	367	339	335	-1.2

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

Unit: Kg per metric ton of cement	Base year (FY1991)	FY2015	FY2016	FY2017	FY2018	FY2019
Amount used	227	459	441	430	425	417

Material and Thermal Recycling Amounts in Cement Production

Unit: 1,000 metric tons	Base year (FY1991)	FY2015	FY2016	FY2017	FY2018	FY2019
Material recycling	1,550	1,711	1,746	1,800	1,786	1,766
Thermal recycling	4	74	84	79	82	81

Site Reports

Tokuyama Factory

Location: 1-1, Mikage-cho, Shunan-shi, Yamaguchi, Japan
 Number of employees: 1,622
 Total site area: 1.91 million m²
 Main products: Cement, inorganic chemical products, organic chemical products, High-purity polycrystalline silicon, fumed silica, High-purity Aluminum Nitride (AlN), 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 2020, the factory is placing top priority on measures to comprehensively remove risks and increase safety awareness and risk sensitivity in an effort to ensure that no accidents or disasters occur. Reducing GHG emissions from the factory's coal-fired power plant is an urgent issue from the perspective of the SDGs. The factory is conducting various initiatives such as energy conservation activities, use of renewable energy, and development of CCUS* technology, with a target of achieving a 15% reduction of emissions from the BAU level by fiscal 2030, compared with fiscal 2013 levels. The Tokuyama Factory aims to continue to grow with the local community while striving for a balance between employee health and sustainable operations.

*CCUS: Carbon dioxide Capture, Utilization and Storage

Performance Data

	Unit	FY2015	FY2016	FY2017	FY2018	FY2019
SOx emissions	Metric tons	680	750	780	800	810
NOx emissions	Metric tons	8,900	9,500	10,100	10,100	10,220
Soot emissions	Metric tons	138	138	168	122	127
Industrial water consumption	Million metric tons	42.1	44.1	44.5	44.7	43.5
Effluent discharged	Million metric tons	24.2	24.2	24	24	22
COD level	Metric tons	124	114	119	127	101
Total nitrogen discharged	Metric tons	92	145	173	159	170
Total phosphorous discharged	Metric tons	2.2	2.1	2.1	2.3	1.5
PRTR-designated substance emissions	Metric tons	36	29	29	33	24
Waste generated	Thousand metric tons	389	376	366	339	335
Waste sent to landfills	Metric tons	383	368	382	397	631
Energy consumption	Thousand gigajoules	45,100	47,100	49,500	49,000	49,000
CO ₂ emissions (originating from fossil fuel)	Thousand metric tons	4,110	4,290	4,500	4,430	4,460
Complaints	Cases	1	0	0	3	0

Emissions and Transfer of Specific PRTR-Designated Substances in Fiscal 2019

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	6.1	0.0	0.0	6.2	0.9
Chloroethylene (vinyl chloride)	94	5.2	0.0	0.0	5.2	0.0
Chloromethane (methyl chloride)	128	3.7	0.0	0.0	3.7	0.0
Chlorodifluoromethane	104	1.8	0.0	0.0	1.8	0.0
Cresol	86	0.0	1.4	0.0	1.4	0.0
Toluene	300	1.9	0.0	0.0	1.9	1.4
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	0.0	0.0	0.0	0.0
Water-soluble compounds of zinc	1	0.0	0.6	0.0	0.6	0.0
1-Bromopropane	384	0.1	0.0	0.0	0.1	0.0
1,2-Dichloropropane	178	0.4	0.0	0.0	0.4	141.6
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	0.9
Dioxins	243	4.9	2.3	0.0	7.3	0.0
Total (excluding dioxins)		21.9	1.9	0.0	23.9	146.5

Substances are listed in descending order of emission 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

Results of Environmental Protection Initiatives by the Tokuyama Factory in Fiscal 2019

Degree of target achievement:
Achieved (○) Not achieved (X)

Category	Items	FY2019 Target	FY2019 Result	Rating	FY2020 Target	
Environmental Impact Reduction	Atmosphere	Soot	+4%	-	Maintain the current low-impact situation*	
	Water Quality	COD	△ 20%	-		
		Nitrogen	+7%	-		
		Phosphorus	△ 35%	-		
PRTR	PRTR	△ 29%	-			
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	△ 9.0%	○	3% reduction of per-unit energy consumption by fiscal 2020 compared to fiscal 2005
Waste Reduction	Recycling	Effective utilization rate	Maintain at 92%	94.0%	○	Achieve 94%
	Zero emissions	Zero emissions to landfills	Maintain 99.9% reuse/recycling rate	99.8%	X	Achieve 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 FY2018 results is shown.

Kashima Factory

Location: 26 Sunayama, Kamisu-shi, Ibaraki, Japan
 Number of employees: 121
 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)



Kazumasa Itonaga
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 2020, 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 2019, the factory achieved a 77% waste effective utilization rate, generating eleven 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	FY2015	FY2016	FY2017	FY2018	FY2019
Industrial water consumption	Thousand metric tons	43	36	39	25	27
Effluent discharged	Thousand metric tons	54	50	54	39	42
COD level	Metric tons	2	2	2	2	2
PRTR-designated substance emissions	Metric tons	2	2	2	1	1
Waste generated	Metric tons	735	775	761	831	896
Waste sent to landfills	Metric tons	20	9	9	8	11
Energy consumption	Thousand gigajoules	33	37	39	36	36
CO ₂ emissions (originating from fossil fuel)	Metric tons	2,246	2,670	2,697	2,594	2,659
Complaints	Cases	0	0	0	0	0

Emissions and Transfer of Specific PRTR-Designated Substances in Fiscal 2019

Unit: metric tons

Substance name	Regulatory number	Amount of emissions				Amount transferred
		Atmospheric	Water	Soil	Subtotal	
Dichloromethane	186	0.6	0.0	0.0	0.6	2.0
Chloroform	127	0.4	0.0	0.0	0.4	76.8
Toluene	300	0.1	0.0	0.0	0.1	22.2
Acetonitrile	13	0.0	0.0	0.0	0.0	3.2
1,4-dioxane	150	0.0	0.0	0.0	0.0	0.0
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	10.5
Water-soluble salts of bromic acid	235	0.0	0.0	0.0	0.0	0.0
2-Vinylpyridine	338	0.0	0.0	0.0	0.0	0.5
Boron compounds	405	0.0	0.0	0.0	0.0	0.1
Methyl methacrylate	420	0.0	0.0	0.0	0.0	0.0
Total		1.0	0.0	0.0	1.1	117.3

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

Substances are listed in descending order of emission 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

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: 223
 Total site area: 89,800m²



Nobuhiko Nakayama
Plant Manager



Location: 7-7, Harumi-cho, Shunan-shi, Yamaguchi, Japan
 Number of employees: 141
 Total site area: 24,100m²

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	FY2015	FY2016	FY2017	FY2018	FY2019
Waste generated	Metric tons	15	23	38	44	47
Waste sent to landfills	Metric tons	5	10	17	44	15
Energy consumption	Thousand gigajoules	356	403	467	514	529
CO ₂ emissions	Thousand metric tons	21	23	23	25	26
SOx emissions	Metric tons	0.3	0.1	—	—	—
NOx emissions	Metric tons	0.7	0.4	1.0	1.3	1.5
Soot emissions	Metric tons	0.04	0.02	0.01	0.04	0.05

Tokuyama Plant

Sun-Tox's Tokuyama Plant manufactures biaxial-oriented polypropylene films, which are mainly used for food and beverage packaging. As part of its environmental initiatives, the plant is actively working to reduce per-unit energy consumption and increase recycling rates. The plant further ensures health and safety management activities as an OSHMS-certified workplace. Under the slogan, "Strictly following safety procedures, making manufacturing enjoyable, and never compromising quality," the plant continues to keep its facilities operating safely so it can be depended upon by the community, customers and employees.

Performance Data

	Unit	FY2015	FY2016	FY2017	FY2018	FY2019
Waste generated	Metric tons	74	84	68	86	88
Waste sent to landfills	Metric tons	1	1	1	1	1
Energy consumption	Thousand gigajoules	471	463	422	368	349
CO ₂ emissions	Thousand metric tons	27	28	25	20	19
PRTR-designated substance emissions	Metric tons	0.0	0.0	0.0	0.0	0.0
Complaints	Cases	0	0	0	0	0

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: 28
 Total site area: 3,280m

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 21 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	FY2015	FY2016	FY2017	FY2018	FY2019
Power consumption	Thousand kilowatt hours	2,659	2,490	2,533	2,631	2,633
Waste plastic produced	Metric tons	141	135	128	171	152
Waste plastic effectively used	Metric tons	141	135	128	171	152
Waste sent to landfills/offsite for disposal	Metric tons	6	0	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 Corporation (50%), Prime Polymer Co., Ltd. (50%)
 Head office: 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: 70,997m

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 for 44 years since the time it was operated as Tokuyama's polypropylene film business. In fiscal 2020, the plant continues to pursue Responsible Care activities with the goals of achieving its accident- and disaster-free record, reducing its environmental impact, and eliminating customer complaints related to quality.

Performance Data

	Unit	FY2015	FY2016	FY2017	FY2018	FY2019
Industrial water consumption	Thousand metric tons	370	333	378	343	352
Waste generated	Metric tons	35	77	35	66	40
Waste sent to landfills	Metric tons	0	1.8*	0	1.6*	0
Unit energy consumption index (fiscal 2002=100)	%	71	73	69	70	78

* Year with periodic maintenance

Company Outline

Overview of Business Fields

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
- ▶ High-purity trichlorosilane

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

- ▶ Processing of waste into cement raw material
- ▶ Recycling of waste gypsum boards
- ▶ Utilization of waste plastic for fuel

Life & Amenity Business Division



MA Business

- ▶ Bulk pharmaceutical ingredients/intermediates



TS Business

- ▶ Plastic lens-related materials



NF Business

- ▶ Microporous film



Group Companies

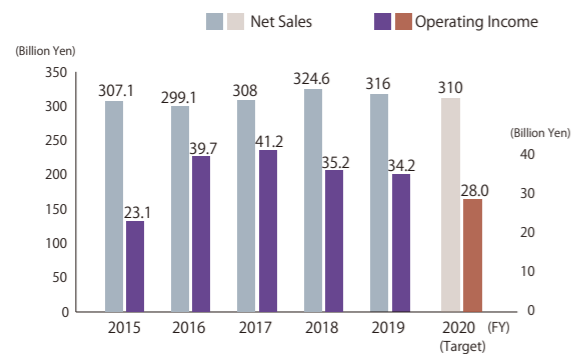
- ▶ Polyolefin film ▶ PVC window
- ▶ Dental materials
- ▶ Medical diagnosis systems
- ▶ Ion exchange membranes and systems
- ▶ Plastics processing

Financial Highlights

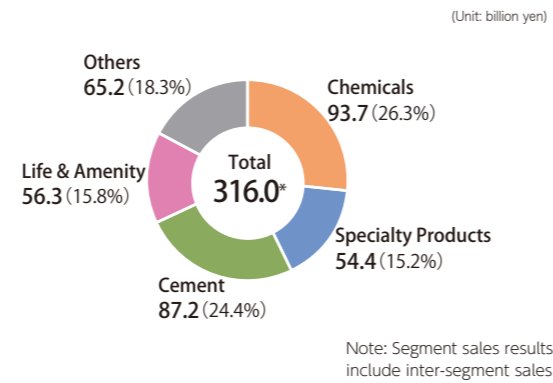
Implementing the Medium-Term Management Plan (April 2016–March 2021)

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

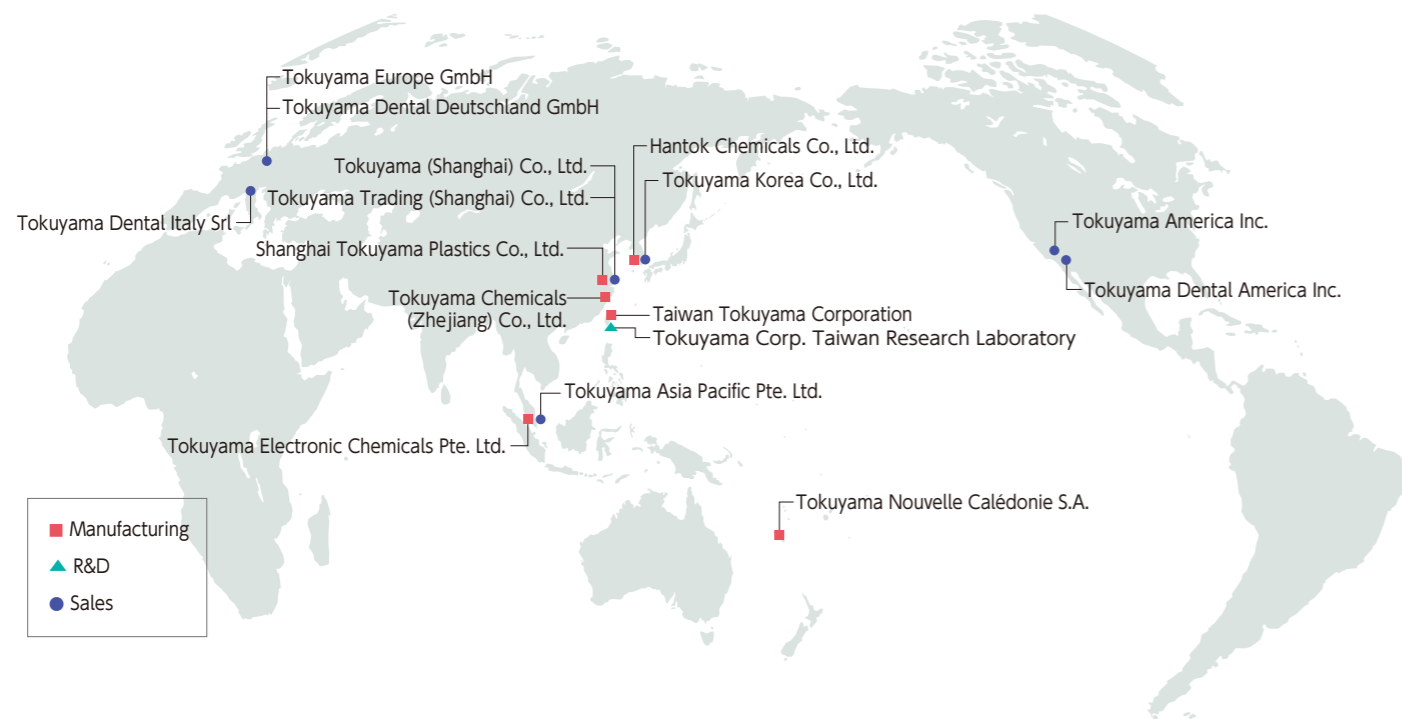


Fiscal 2019 Sales by Business Segment



Global Network

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



Third-Party Review

A Review of Tokuyama's CSR Report

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



From a Century in Business, into a New Era

With the global COVID-19 pandemic, 2020 is shaping up to be a major turning point in history. In addition to changing how we work and what we do, it is changing our views of the connections between people, and of society and culture. The level of interest in the SDGs has risen, and we have a clearer idea of what needs to be done and the issues that need to be resolved. Tokuyama has already started tackling these issues. This report embraces the paradigm of the SDGs and describes the social issues that Tokuyama is addressing using its technologies and innovations, and the value it is supplying to society. This suggests that we can depend on Tokuyama to meet the demands of society.

At the same time, Tokuyama has been meeting social expectations throughout its 100-year history, long before the SDGs were born. This commitment justifies its existence as a corporation. I hope that Tokuyama will succeed in making more people aware of its initiatives and gain more admirers.

Response to Third-Party Review

Kazuo Matsuya

Executive Officer
General Manager,
Corporate Social Responsibility Division



2020 is indeed turning out to be an inflection point due to the COVID-19 pandemic, which requires that we change our processes for taking action on socially responsible management. While we have now identified the SDGs Tokuyama will focus on, we have always addressed social issues across our various businesses. This commitment is ingrained in our corporate culture and is something that we will carefully perpetuate. Additionally, we will

CSR Initiatives Using Materiality Assessments

In March 2019, Tokuyama identified its material issues and this year has disclosed its progress in achieving targets. Having achieved many of the items, the company considered its next steps and identified environmental issues as a material issue, subsequently launching the CO₂ Project Group in January 2020. Tokuyama also deserves praise for taking steps to adhere to the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD),* and taking action on the issue of coal-fired power plants.

Tokuyama is pursuing maintenance targets for many of its current material issues, which leaves relatively few items where it has made numerical progress. In its next review, I hope that Tokuyama will add more items that are connected to its value creation model, and visually quantify the value it is newly creating.

Information Disclosure and Communication

This report gives a detailed description of the Shin-Taketori Monogatari event and contains a dialogue with individuals involved in the event. The report and dialogue manages to convey how Tokuyama works with and contributes to the community, focusing on the local issue of invasive bamboo. Going forward, Tokuyama should engage in a dialogue with remote stakeholders such as investors and students, as well as with employees close to home. The company should also actively disseminate information for that purpose.

*TCFD is an initiative launched by the Financial Stability Board to recommend information disclosure of the strategic and financial impact of climate change risks and opportunities.

further disseminate information in an effort to better communicate Tokuyama's activities to even more stakeholders.

With regard to material issues, the KPIs for this fiscal year indicate that we have achieved nearly all the targets. We will endeavor to clarify where we stand in terms of achieving the targets, and rapidly execute PDCA cycles.

We will begin implementing a new medium-term management plan in 2021. In addition to further enhancing our socially responsible management, we will clearly convey the future vision for our businesses with an emphasis on the SDGs and ESG. Furthermore, the entire Tokuyama Group will work together to accelerate its initiatives to address the chief material issue of reducing CO₂ emissions.

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 (As of March 31, 2020)

Number of employees: 5,679 (consolidated basis; including 540 working overseas);
2,063 (non-consolidated basis)(As of March 31, 2020)

Number of group companies: Consolidated subsidiaries 54
Equity-method affiliates 10
(As of April 1, 2020)

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 2020* 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 2020 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 2019 (April 1, 2019 to March 31, 2020); certain activities carried out in fiscal 2020 are also covered.

Companies covered:

Tokuyama Group; environment-related data is for the Company's Tokuyama Factory, Tsukuba Research Laboratory and Kashima Factory; some performance data includes the sum of the data from 23 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, 2020

Next issue (tentative):

September 2021

(previous issue was in September 2019)