

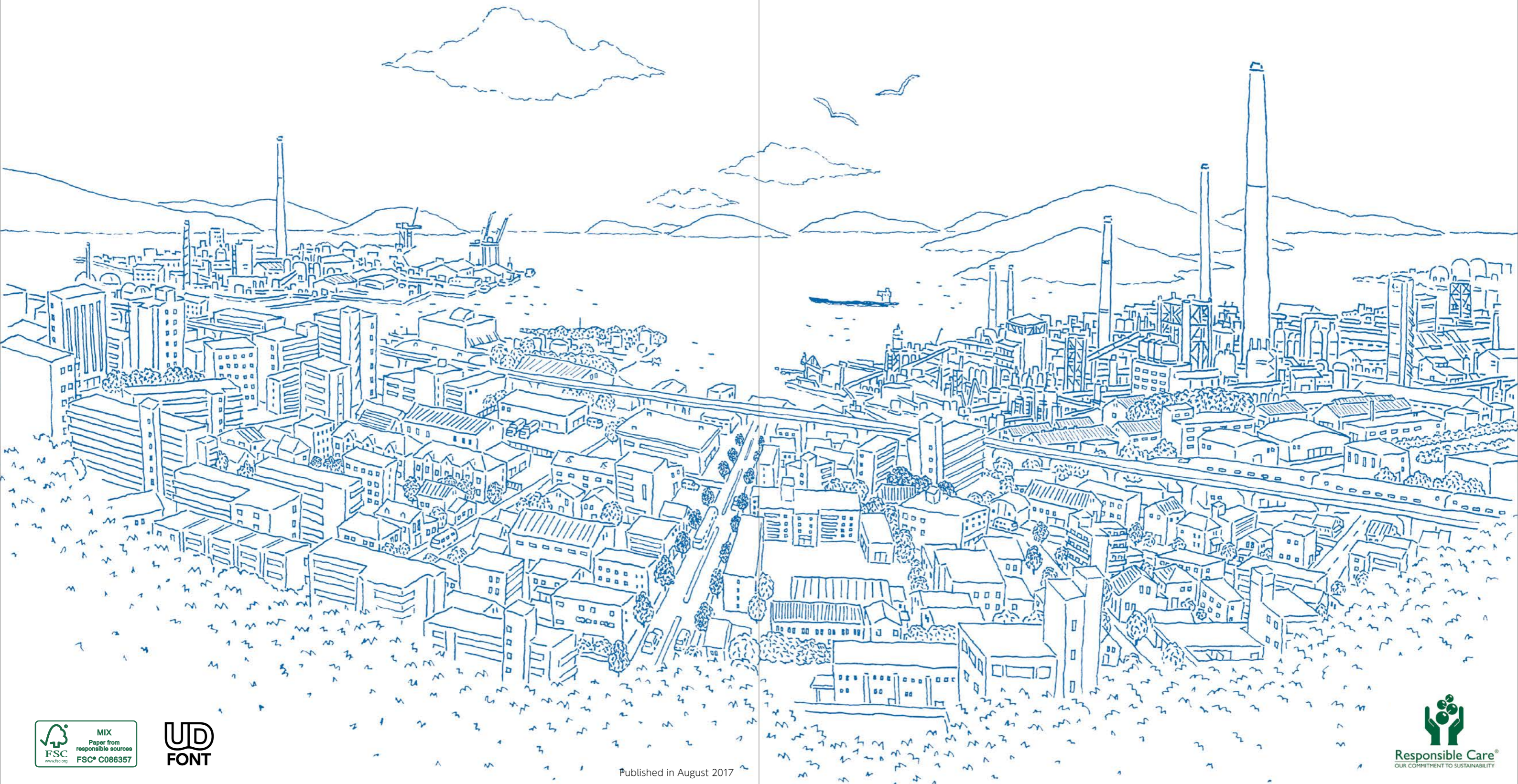
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CSR Report 2017



Published in August 2017



Harnessing the Potential of Chemistry to Support a Century of Service to Society

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 its technology and experience to serve a wide range of sectors including electronics, ICT, lifestyle, healthcare, environment, and energy. The Tokuyama Group is embarking on another 100 years in business and will continue to fulfill its mission; "Centered on the field of chemistry, the Tokuyama Group will continue to create value that enhances people's lives." Guided by the Tokuyama Vision, the Group is determined to create new value that drives sustainable growth as a corporate group valued by society.

VISION OF TOKUYAMA

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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Editorial Policy

● The CSR Report 2017 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.

www.tokuyama.cb.jp/eng/csr/report/

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

● The CSR Report 2017 has been produced based on the Environmental Reporting Guidelines (Fiscal 2007 edition) published by the Ministry of the Environment of Japan.

[Scope of the Report] - Period covered: Performance data is from fiscal 2016 (April 1, 2016 to March 31, 2017); certain activities carried out in fiscal 2017 are also included.

Companies covered: Tokuyama Corporation; environment-related data is for the Company's Tokuyama Factory and Kashima Factory; some performance data includes 10 main manufacturing subsidiaries in the Tokuyama Group.

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

Date of publication: August 31, 2017



On the cover

Illustration of the view from the top of Mt. Kongo in Yamaguchi Prefecture, overlooking Shunan City and the Tokuyama Factory. The illustration symbolizes the symbiosis between Tokuyama and the local community, and the abundant natural beauty that Tokuyama is committed to conserving.



Creating Value That Benefits People's Lives through Chemistry

Hiroshi Yokota
Hiroshi Yokota
President

Fiscal 2016 in Review

Fiscal 2016 was the first year of our latest medium-term management plan. We exceeded our targets by recording 10% or higher operating margins in each of our business divisions, while exceeding our projections for restoring equity capital. We realized more than ¥2 billion in cost reductions at the Tokuyama Factory by making changes to increase competitiveness. The biggest factors driving higher profits were lower prices for raw materials and fuels including coal and naphtha.

This represents a good start as we tackle the main goals outlined in our medium-term management plan: to change the organizational culture and

structure of the Tokuyama Group, rebuild our business strategies, strengthen Group management, and improve our financial position. Yet there is still much that we have to do.

Gearing Up for Further Growth in Fiscal 2017

Fiscal 2017 is the year the Tokuyama Group will complete the sale of Tokuyama Malaysia Sdn. Bhd. and gear up toward realizing further growth.

We are focusing on strengthening our business in the information and communication technologies (ICT) and healthcare sectors. In order to keep up with the latest technologies in the ICT sector, we

will comprehensively refine our strengths in purification technologies to rapidly meet the needs of our customers. In the healthcare sector, we are refining our technologies by integrating development, manufacturing, marketing, and quality assurance processes—aiming to live up to the confidence our customers have in us throughout the lengthy process from development, to approval, to market release.

In our traditional businesses, we are projecting growth in Asian markets. To stay competitive and secure growth, we are determined to keep comprehensively streamlining for cost competitiveness.

Strengthening Corporate Governance by Adopting an Audit and Supervisory Committee Governance System

Tokuyama has shifted to a system with an audit and supervisory committee in order to strengthen governance by further clarifying the distinction between and the functions of management execution and supervision. This change will accelerate business execution and facilitate in-depth discussion of business policy and other matters by the Board of Directors. It will also strengthen supervisory functions to ensure proper business execution.

Corporate Social Responsibility and Responsible Care

Customer satisfaction remains at the heart of everything we do. We will use this commitment to drive our initiatives to fulfill our corporate social responsibilities, positively contributing to communities and practicing environmentally responsible management.

The Tokuyama Group will continue to embrace and practice Responsible Care, responding to higher social expectations for environmental conservation and rigorous compliance with chemical safety regulations around the world.

To further secure safety, we are leveraging technology transfers to younger employees in a variety of ways. To this end, we will make use of various initiatives

and occasions, including the emergency drills on plant operations we conduct jointly with other companies in the Shunan industrial complex.

Additionally, we are comprehensively reviewing our capital investment, maintenance, and repair activities, while actively deploying technologies such as Internet of things (IoT) and artificial intelligence (AI), aiming to establish a competitive lead in Japan.

A Century in Business, and the Next 100 Years

In 2018, the Tokuyama Group will reach the landmark of 100 years in business, an achievement made possible through the efforts of past and present employees, and thanks to our business partners, customers, and the communities in which we do business. While the last few years have brought their share of challenges, our employees are ready with renewed confidence and pride to move forward and start the next 100-year chapter of our history.

Delivering Noticeable Transformation

The next 100 years will bring significant changes driven by new technologies such as AI. The Tokuyama Group will need to keep proving its value to society amid these changes.

I constantly remind our employees to question conventional ideas, since what we may think is conventional may not necessarily be so at other companies. By questioning conventional ideas and precedent, we will surely bring about change—both in our corporate culture and in our mindset.

We will keep questioning the value that we create, and ask ourselves who we are supplying value to and what satisfaction they derive from it. Instead of satisfying only ourselves, we will check with customers to reexamine our own work. Each of us will continue to practice these principles in order to transform the Tokuyama Group in ways that our customers will clearly see. This, in turn, will enable us to fulfill our ongoing mission to create value that enhances people's lives through chemistry, for the next century and beyond.

Corporate Social Responsibility

Pursuing Corporate Social Responsibility by Practicing Socially Responsive Management

Tokuyama practices corporate social responsibility in management, leveraging the chemical technology it has amassed to create and keep providing new value in order to bring joy to people and contribute to social progress.

Tokuyama's Approach to CSR

Tokuyama works to build positive relations with stakeholders in accordance with its mandate to practice corporate social responsibility (CSR). Under Japan's Corporate Governance Code, companies are directed to "achieve sustainable growth and increase corporate value over the mid- to long-term." Tokuyama believes that achieving these aims will help to ensure its social responsibilities are met. It also implements internal controls to anchor its CSR initiatives, focusing on risk management and compliance.

As a chemical manufacturer, Tokuyama gives utmost priority to exercising Responsible Care through the consistent operation and enhancement of management systems for safety, the environment, and quality.

To achieve sustainable growth while earning public trust and being the consistent choice of customers, the Tokuyama Group ensures that all employees and officers understand and adhere to the Group Code of Conduct and Five Conscience Clauses. Group companies also formulate their own action guidelines to guide their relations with various stakeholders.

Corporate Governance

Tokuyama earns the trust and cooperation of stakeholders by creating and continuously providing new value, which in turn helps to ensure sustainable growth and increase corporate value over the mid- to long-term. Tokuyama has made it a management priority to constantly enhance corporate governance. In keeping with the Corporate Governance Code, Tokuyama respects the rights and equality of stakeholders and is strengthening the monitoring functions and independence of the Board of Directors. At the

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 and practicing corporate conduct that is evaluated highly by its various stakeholders, namely, shareholders, customers, employees, trading partners, communities and society as a whole.



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.

same time, Tokuyama is 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.

Corporate Governance Framework

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 adopted an executive officer system in April 2011 and appointed four external directors for the purpose of strengthening the supervisory function of the Board of Directors.

Audit and Supervisory Committee

The Audit and Supervisory Committee discusses, reports on, and makes resolutions on important auditing and supervisory matters. Directors who sit on the committee attend meetings of the Board of Directors and other important internal meetings, supervising the business execution by executive officers.

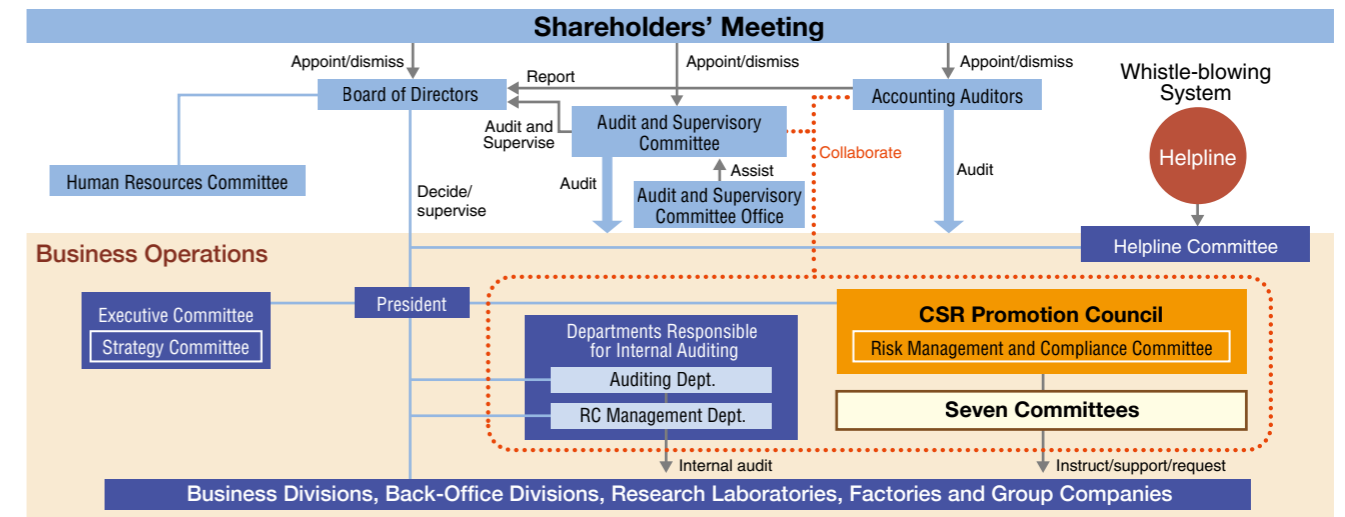
Human Resources Committee

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

Executive Committee and Strategy 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. 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.

Corporate Governance Structure



CSR Promotion Council

Chaired by the president, the membership of the CSR Promotion Council is composed of all executive officers working within Japan. The Council sets CSR-related policies and goals, and deliberates on important matters concerning internal control systems, which constitute the basis for CSR activities.

Risk Management and Compliance Committee

Operating under the CSR Promotion Council, the Risk Management and Compliance Committee is chaired by the director responsible for the Corporate Social Responsibility Division. The committee takes the initiative in promoting risk management and compliance, which are both core elements of internal control systems.

Seven Committees

Tokuyama operates committees focused on risk management and compliance in seven critical and

specialized areas, separately from the Risk Management and Compliance Committee. The committees operate under the CSR Promotion Council, overseeing the following areas: financial reporting, fair trade and competition, international trade, information security, environment, safety, and product safety and quality assurance.

Helpline Committee

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

Departments Responsible for Internal Auditing

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

Making Sure Our Business Contributes to Sustainable Development



Takeshi Nakahara

Director, Managing Executive Officer, General Manager, Corporate Social Responsibility Division

At Tokuyama we are implementing our "New Foundation" corporate vision by developing our global business with a commitment to corporate social responsibility.

Our mission is to continue creating value that enhances people's lives through chemistry. At the same time, we aim to build win-win relationships with all stakeholders by enhancing our compliance, risk management, and internal control systems and improving management efficiency.

Safety is our highest priority. Top management frequently underscores this commitment, and the teams on the production floor use utmost care. We

are also upgrading the level of our process safety, disaster prevention, and safety initiatives by incorporating new technologies such as the Internet of things (IoT).

In the area of Responsible Care, we have expanded our environmental management system with reference to the Sustainable Development Goals (SDGs) adopted at the United Nations Sustainable Development Summit in 2015. We aspire to build a more sustainable world by further reducing energy intensity and expanding resource recycling in our cement business.

Contributing to Society with Unique Technologies

Harnessing the Potential of Chemistry to Meet Customer Needs and Create a Safer, More Comfortable Society

Tokuyama has been developing its own technologies and products for nearly a century, providing customers with materials that trigger business innovation while working to reduce environmental impact and helping to maintain and improve people's health. The Group also leverages its unique technologies and original products to reduce environmental impact, improve lives, and contribute to society.

Taking the Customer's Point of View

Tokuyama's mission is to play a useful role in its customers' businesses and contribute to the development of society by supplying soda ash, a primary industrial product that is indispensable to the development of Japanese industry.

One of Tokuyama's mainstay products, caustic soda, is an important raw material for many products

that are indispensable to daily life. The process of caustic soda manufacturing yields chlorine as a co-product and hydrogen as a by-product, and these play a supportive role in industry as the raw materials for chloride, polycrystalline silicon, and urethane, and, with further processing, as chlorinated substances and other derivatives. Hydrogen is also in the spotlight lately as a source of energy for a more sustainable society.

Reducing Environmental Impact

Ensuring safety and reducing environmental impact are among the many responsibilities that a chemical manufacturer is expected to fulfill. Ever since its founding, Tokuyama has actively sought to recycle waste. The Tokuyama Factory is composed of three separate plants. The Tokuyama Plant manufactures inorganic chemicals. The Higashi Plant manufactures organic chemicals and polycrystalline silicon. The Nanyo Plant manufactures cement. Together, these

plants form a recycling-oriented manufacturing facility that relies on its technical prowess to achieve zero emissions in terms of both energy and materials. The most important key to this achievement is the Tokuyama Factory's in-house power generation equipment, which produces 550,000 kWh of electric power.

Solving Problems for Customers and Society

Outstanding original technologies and a unique ability to think and act from the customer's point of view constitute two of Tokuyama's special strengths. Moving forward, the Group intends to take full advantage of these strengths in the key sectors of ICT devices, healthcare, and environmental technologies. The Group will keep contributing to society, striving to remain essential to society and the choice of customers.

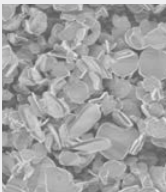
Unique technologies in cutting-edge fields

- High purification
- Reduction nitridization
- Sintering
- Sol-Gel
- Powder control
- Crystallization, deposition
- Electrode, membrane
- Photopolymerization
- Molecular design
- Organic synthesis, direct hydration


ICT

Supporting innovation


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




Boron nitride




Heat-dissipation materials



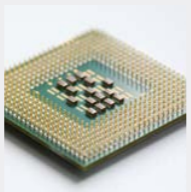
Polycrystalline silicon



Aluminum nitride substrate (Shapal®)



High-purity chemicals for electronics industry



Power semiconductors
Aluminum nitride
Boron nitride

Healthcare

Contributing to health and longevity

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



Dental materials
Composite resin



Radiation detector for tip medical care
LICAF



Diagnostic reagents, clinical analyzers, laboratory information systems, laboratory automation systems



Photochromic compounds



Microporous film (The back sheet film of paper diapers)



Bulk pharmaceuticals for generic drugs

Environment

Creating a low-carbon, recycling-oriented society

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




Plastic window sashes



Recycling sewage sludge as biomass energy



Liquid hydrogen (hydrogen car)



Recycling of waste gypsum board



Feature 1

Chemicals Business

Providing Essential Chemicals for Japanese Industry

Another Century of Progress Driven by Technology and Human Resources

Soda Ash (Sodium Carbonate) and Calcium Chloride

Tokuyama was originally established around the soda ash business, which remains the Company's traditional business. Soda ash is used in a variety of applications including glass, soap, detergents, food and beverage additives, and water treatment auxiliaries, while the production co-product, calcium chloride, is broadly used as an anti-freeze agent for roads and a moisture-absorption agent. Soda ash and calcium chloride are essential to Japanese industry and used often in everyday life. As the only manufacturer of soda ash in Japan, Tokuyama is working to enhance the security of its supply while raising global competitiveness for the future.

100 Years of Tradition Manufacturing Soda Ash

Tokuyama was founded in 1918 with the establishment of Nihon Soda Kogyo Co., Ltd. This company was created with the important mission of manufacturing soda ash in Japan using an ammonia-soda process, to remediate the reliance at the time on imported soda ash.

Tokuyama continues to manufacture soda ash, now as the sole manufacturer in Japan, with an estimated 40% share of the Japanese market. The Company has weathered numerous hurdles including trade liberalization, increased imports of natural soda ash from the United States, an oil crisis, and reduced

Milestones in Tokuyama's Soda Ash Business

- 1918 Nihon Soda Kogyo Co., Ltd. established
- 1927 First shipment of soda ash
- 1938 Started manufacturing cement by wet process using soda ash by-products
- 1940 Started manufacturing calcium chloride
- 1948 Restarted manufacturing of soda ash
- 1950 Started manufacturing of ammonium chloride fertilizer
- 1980 Switched to co-production of calcium chloride
- 2014 Tokuyama & Central Soda Inc. established

demand, as other Japanese companies have withdrawn from the business.

Changing Manufacturing Processes and Co-Products to Secure Business Continuity

Since Tokuyama imports all of the salt that it uses to make soda ash, the Company takes ongoing measures to adopt manufacturing process that keep costs down and works to market co-products to increase revenues. In the 1950s, the Company switched to a process that co-produces soda ash and ammonium chloride, in order to make the most of the raw material salt. Strong demand for ammonium chloride as a fertilizer drove revenues and contributed to increased post-war feed production.

Demand for ammonium chloride fertilizer later decreased, prompting the company to switch to a process

that co-produces soda ash and calcium chloride. With the switch, the Company conducted a comprehensive reassessment of its manufacturing facilities and processes, which boosted manufacturing efficiency and made it possible to make high-quality food additive grades with few impurities.

Tokuyama is also the sole manufacturer in Japan of granular calcium chloride, which is used as an anti-freeze agent in winter, having an estimated 70% share of the Japanese market. This product has contributed significantly to company revenues from the soda ash business.

Expertise Backed by a Century of Experience

Human resources play a major role in securing the continuity of the soda ash business. All employees who are involved in the soda ash business are proud to work for this founding business and motivated to ensure its continuity for future generations of employees. Tokuyama's soda ash plant, which supports the Company's century-old business in this field, requires advanced operating and maintenance skills by employees who draw on a century of experience. These skills are refined at the production site and via small group activities, whereby employees examine a wide range of issues to make improvements, which are then shared with other groups. These small groups present their activities to one another, which promotes the professional development of employees.

Fulfilling Supplier Responsibilities and Enhancing Global Competitiveness

In 2014, Tokuyama established Tokuyama & Central Soda Inc. in a joint venture with Central Glass Co., Ltd.,

to aggregate the marketing of soda ash and calcium chloride and enhance customer support.

The soda ash and granular calcium chloride manufacturing operations are currently running at full capacity to meet Tokuyama's responsibilities as a supplier and the sole manufacturer of these products in Japan. The Company is expanding its production capacity for granular calcium chloride by 25%, with this new capacity to be ready in the fall of 2017, to further stabilize the supply.

To withstand increased competition from manufacturers in countries such as the U.S. and China, Tokuyama will implement further streamlining and maximize the use of its facilities to increase cost competitiveness. At the same time, the Company will further build on its strengths in quality control to enhance global competitiveness.

Applications for Soda Ash

Glass (including for automotive, architectural, and LCD touchscreen applications); bottle glass; fiberglass (insulation); soap and detergents; food additives; organic synthesis for glutamic acid, amino acids, and soy sauce; water treatment agents; other



Applications for Calcium Chloride

Anti-freeze agent and snow-melting agent for roads, moisture-absorption agents, food and beverage additives, other

Voice >>>

Meeting Our Responsibilities as the Sole Manufacturer in Japan

Tokuyama has launched the sodium silicate cullet and precipitated silica businesses as a way to increase its internal consumption of soda ash. Adding these products has been an asset in terms of expanding our business range and contributing revenues.

The Tokuyama Factory supplies many customers, due in part to being the sole supplier of

soda ash manufactured in Japan. We invite our customers to tour the production site in person and share our initiatives for process safety, disaster mitigation, and occupational health and safety, to ease any supply concerns. We will continue to prepare against all possible risks, so that we can keep meeting our responsibilities as a supplier.

Hiroki Tanaka (right)

General Manager, Chemicals Manufacturing Department 1
Chemicals Business Division

Yoshimi Tamaki (left)
Manager, Manufacturing Section 1





Feature 2

Life & Amenity Business

Securing Growth in Fine Specialty Chemicals

Integrating Development, Manufacturing, Marketing, and Quality Assurance to Accelerate Expansion of APIs into New Fields

Tokuyama brought its first active pharmaceutical ingredients (APIs) to the generic market in 2006. The Company's business in this segment has been growing since then, with the Company bringing to market eight APIs for drugs treating conditions such as ulcers, diabetes, allergies, and hypertension. The Company is working to further raise added value and secure differentiation in the generic API business.

Ten Years of Experience Manufacturing APIs

Tokuyama began contract manufacturing APIs for customers in 1996 at the Kashima Factory. The Company expanded into the generic API market in 2003, in order to leverage its expertise in organic synthesis and take advantage of a policy shift by the Japanese government in favor of generic drugs.

The Company brought its first generic API to market in 2006 in the form of a glaucoma treatment drug, and currently offers eight APIs centering on cardiovascular and diabetes treatment drugs. These APIs have earned a strong reputation from drug manufacturers, enabling Tokuyama to capture a strong presence in the generic API market, which accounts for more than 60% of the pharmaceuticals market.

Advanced R&D Capabilities Needed for Generic APIs

Generic API manufacturers must develop their own manufacturing processes from the ground up, as expiring

manufacturing patents for brand-name drugs do not describe the manufacturing processes. Furthermore, all phases of the manufacturing process, from quality control and manufacturing to regulatory compliance, must meet or exceed the level required for brand-name drugs.

Tokuyama filed more than 100 patents in the ten years through 2015, a number that far exceeds that of the typical pharmaceutical company. Drug prices in Japan are set by the government, making it difficult for manufacturers to adjust prices to reflect drug performance and quality. Despite this challenge, Tokuyama is leveraging its strengths in process technology to enhance cost competitiveness.

Generic APIs Brought to Market by Tokuyama

Fiscal Year Released	Generic Name	Therapeutic Category
2006	Nipradilol	Antiglaucoma
2009	Voglibose	Antidiabetic
	Polaprezinc	Antiulcerative
2010	Pioglitazone hydrochloride	Antidiabetic
2012	Mosapride citrate hydrate	Prokinetic
2013	Valsartan	Antihypertensive
2014	Candesartan cilexetil	Antihypertensive
2015	Olanzapine	Antipsychotic

Working Closely with Customers to Meet Their Needs

Tokuyama works closely with customers to advance API development, with sales and development working in concert. Business development is pursued in unison between various departments, such as involving quality assurance personnel in the process development phase to ensure that the quality sought by customers is realized.

The generic API market is expected to become increasingly competitive over time, due to the large number of companies in and outside Japan competing. To stay competitive, Tokuyama will raise the performance of all related departments and increase the level of interdepartmental collaboration (see illustration).

In the development of the antihypertensive agent, Candesartan, which was released in 2014, Tokuyama had to satisfy the need for a highly stable API with a fine particle size for ease of dissolving and absorption. To meet these demands, Tokuyama studied and analyzed the particle state of the API in the brand-name drug, and set a target value for the manufacturing particle size, developing new crystallization and pulverizing technologies to achieve the target. Candesartan is now used by many pharmaceutical manufacturers as a highly dissolvable oral agent.

Leveraging the Control Functions of the Kashima Factory

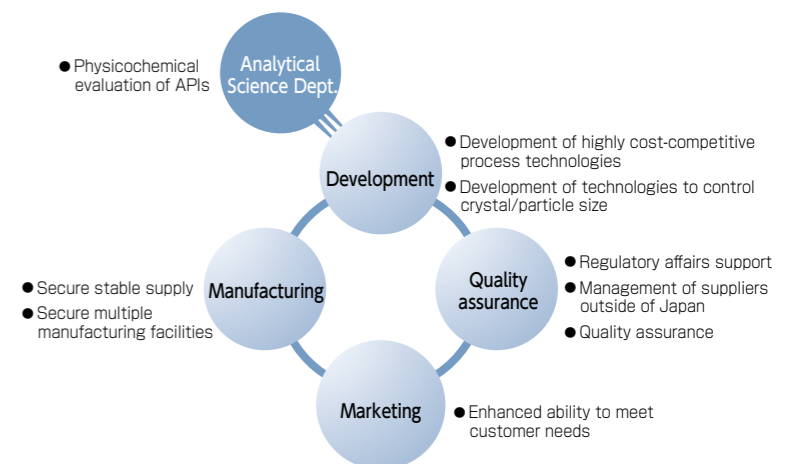
Generic APIs become progressively more commoditized over time as the market begins to demand low-cost imported APIs. To cope with this commoditization, Tokuyama is working to strengthen its cooperation

with overseas suppliers to manufacture the Company's APIs while maintaining quality.

The Company expanded its multi-plant Kashima Factory in 2016 and is strategically positioning the plant to cooperate with suppliers in countries such as China and India, to address commoditization of APIs. The Kashima Factory will leverage control by transferring its expertise in areas such as quality assurance and manufacturing process technology to suppliers in and outside of Japan, while working closely with the suppliers to generate steady revenues.

Tokuyama is presently developing new APIs that are projected for market by 2020, as the Company expands its API lineup to cover a broader range of treatments. Additionally, the Company is actively looking into pharmaceutical-related materials that will also benefit its engineering development. Tokuyama is committed to leveraging its own technologies and comprehensive strengths in the healthcare field to bring amenity and healthy living to people.

Business Development Integrating Development, Manufacturing, Quality Assurance, and Marketing



Voice))

Leveraging Our Development Expertise and Customer Support to Realize Further Growth

The strength of Tokuyama lies in the way business development is integrated across development, manufacturing, marketing, and quality assurance. One example is the training in Good Manufacturing Practices (GMP) that the Quality Assurance Department has conducted for over ten years. This training is implemented with the joint involvement of manufacturing, engineering, and quality assurance teams from the Kashima Factory, to learn about pharmaceuticals manufacturing practices and regulatory changes.

These ongoing efforts have earned the confidence of customers in our quality assurance. We will leverage this reputation for quality to advance production in countries such as China and India. Our customers tell us that they trust Tokuyama's quality, regardless of where a product is made. We will develop manufacturing processes that further raise our quality and cost competitiveness, as we make further inroads in the overall pharmaceuticals market.

Fumiaki Iwasaki

Executive Officer, Research and Development Division
General Manager, Tsukuba Research Laboratories
General Manager, Medical Associated Department



Responsible Care

Protecting the Environment, Ensuring Safety, and Promoting Good Health for People and Local Communities

Responsible Care activities are an essential component of Tokuyama's corporate social responsibility. Tokuyama has put in place company-wide infrastructure 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.



What Is Responsible Care?

Responsible Care is a voluntary management initiative through which companies that manufacture and handle chemical substances undertake measures for protecting the environment and ensuring the safety and health of society. It covers all operations, from the development of chemical substances to their manufacturing,

distribution, usage, final consumption and disposal. Responsible Care also encourages the public disclosure of these activities along with dialogue and communication with members of society. The Responsible Care initiative originated in Canada in 1985, and is currently used in 52 countries around the world. In Japan, a Responsible Care Committee has been set up under the Japan Chemical Industry Association (JCIA). As of April 1, 2017, the committee had 109 corporate members. As one of the original members of the organization,

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, 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

Tokuyama has been actively implementing Responsible Care activities since the committee's founding in 1995.

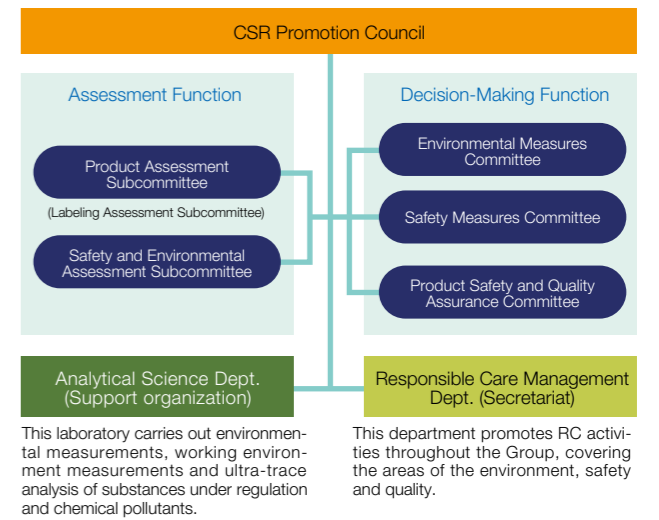
Framework for Promoting Responsible Care

Tokuyama has established a number of organizations that pursue concrete initiatives under its CSR Promotion Council, which is chaired by the company president. Specifically, it set up the Environmental Measures Committee, Safety Measures Committee, and Product Safety and Quality Assurance Committee as decision-making bodies, and the Product Assessment Subcommittee and several other subcommittees as assessment organizations.

Responsible Care Initiatives

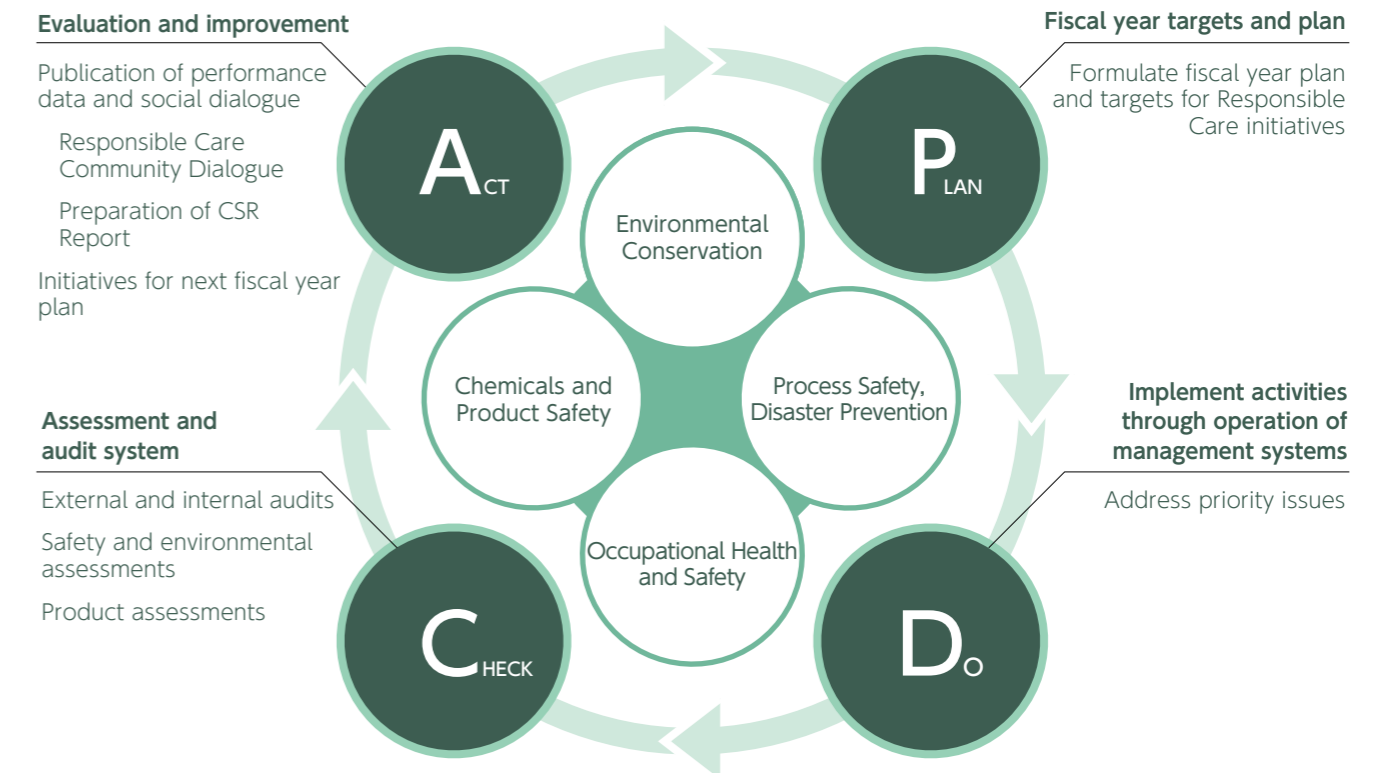
Tokuyama continually improves its Responsible Care initiatives by implementing plan-do-check-act (PDCA) cycles focusing on environmental conservation, process safety, disaster prevention, occupational health and safety, and chemicals and product safety.

Responsible Care Promotion Structure



Medium-term Responsible Care Activities: "Plan" Phase

Working on the basis of its medium-term plan for Responsible Care activities, Tokuyama sets policies and goals for each fiscal year. Individual departments then create and carry out specific plans based on these policies and goals. The results of initiatives are evaluated at the end of each fiscal year and incorporated in plans for the following fiscal year.



Operation of Management Systems: “Do” Phase

The Company’s Tokuyama Factory and Kashima Factory have acquired ISO 14001 certification. Each factory sets an environmental policy and goals in line with Tokuyama’s company-wide environmental policy, and undertakes related activities intended to alleviate environmental impact, conserve energy, reduce waste, and recycle resources. Tokuyama’s head office, branch offices and research laboratories also set policies and goals, and pursue such activities as energy conservation, resource recycling, and waste reduction.

Tokuyama has acquired ISO 9001 certification for its quality management system, which has been operating since fiscal 2002 as a company-wide system encompassing sales, development and all other operations.

In accordance with the New Occupational Health and Safety Guidelines issued by JCIA, Tokuyama operates occupational health and safety management systems at each of its workplaces. In fiscal 2005, the Tokuyama Factory expanded its safety management system by incorporating a broader range of safety-related activities.

Assessment and Audit System: “Check” Phase

Tokuyama has set up several assessment systems in an effort to reduce environmental- and safety-related risks.

» Safety and Environmental Assessments

Tokuyama conducts safety and environmental assessments before newly installing, expanding or modifying any of its facilities. Assessments are conducted at the three phases of basic planning, design, and preliminary operation. The assessments study whether facilities have been designed to incorporate safety and environ-

mental considerations, and that they are completed according to the design specifications. Furthermore, the preliminary operation is assessed to ensure that the performance is up to specification.

» Product and Labelling Assessments

Tokuyama confirms product safety at each stage of operations, from the initial research and development stage through to market release. The assessments confirm compliance with legal requirements and evaluate the level of various risks, including the safety of chemical substances used in the product, their potential impact on the environment, and their effect on human health. The Company also checks all labeling in documents such as product catalogs, safe handling manuals, and safety data sheets* in order to ensure that instructions and warnings are complete and accurate.

* 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.

» Safety and Environmental Audits

Tokuyama conducts safety and environmental audits on an annual basis in order to verify the applicability of its environmental conservation management and accident and disaster-prevention measures.

Auditing teams inspect each workplace, including the Logistics Group, Health Management Center, and all organizations subject to inspection under Japan’s High Pressure Gas Safety Act.

» Audits by Third Parties

Tokuyama undergoes ISO 9001 and ISO 14001 examinations. In April 2017, the examination for renewal of ISO 9001 certification identified three issues, and the Company is dealing with each accordingly. Likewise, examinations for renewal of ISO 14001 certifications were carried out in October 2016. Ten issues were identified, and the factories are now working on remedial measures.



Safety and environmental audit at Kashima Factory



Floor patrol

» Internal Audits

In accordance with its occupational health and safety management system as well as ISO 9001 and ISO 14001 standards, Tokuyama periodically conducts internal audits covering the progress of its action plans and the status of system operations. If problems are uncovered, they are reported, relevant personnel are notified, and remedial measures are taken.

Improvement and Assessment through Audits: “Act” Phase

Audits are used to verify that business sites are suitably carrying out activities in line with corporate policies. Audit results are reported to the relevant departments as well as the president, and continuous improvements are sought.

The results for the fiscal year are shared with stakeholders through Responsible Care Community Dialogue sessions and published in the CSR Report.

Priority Tasks and Results of Responsible Care Activities in Fiscal 2016

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

Category	Priority tasks	Results	Degree of target achievement
Management	Review of Responsible Care management by top managers	<ul style="list-style-type: none"> Held meetings on promoting CSR Conducted safety, environment, and quality audits 	A A
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 No environmental accidents Reduced or maintained levels of emissions of substances of concern Reduced per-unit energy consumption Maintained effective utilization of waste rate of 94% Maintained landfill to total waste rate of 0.1% Continued to improve environmental management systems through operation 	A A A A A A A
Safety and Accident Prevention Occupational Health and Safety	<ul style="list-style-type: none"> Ensure no accidents or disasters occur Enhance safety management systems Promote risk management and hazard management Promote physical and mental health 	<ul style="list-style-type: none"> Achieved another year free of facility accidents Employees: 1 accident requiring work absence, 2 accidents not requiring work absence Contractors: 2 accidents requiring work absence Enhanced safety management systems by assessing process risks Promoted risk and hazard management Conducted various kinds of drills Promoted Smart Life Activity Program 	A B B A A B
Chemical Product Safety	Ensure the safety of products	<ul style="list-style-type: none"> Conducted inspections of products and labeling Revised safety data sheets Actively participated in the JIPS* Addressed regulations on chemicals in countries outside Japan 	A 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	Expand the scope of Responsible Care activities	<ul style="list-style-type: none"> Conducted safety, environment, and quality audits Shared information related to Responsible Care via an online newsletter, etc. 	A A

* JIPS: The Japan Initiative of Product Stewardship is an initiative spearheaded by the Japan Chemical Industry Association with the aim of facilitating the independent management of chemicals. Its members collect and analyze information on the hazardous properties of chemical substances and products in order to carry out risk assessments incorporating data on their usage and applications, comparing levels of exposure and safety. The risk assessment results provide a basis for proper chemical substance management aimed at ensuring workers’ occupational safety, protecting consumers, and reducing environmental impact. The outcomes of such management activities are then disclosed to the general public and suppliers across the supply chain.

Accident Prevention and Occupational Health and Safety

Forging Strong Ties with Local Communities while Building a Positive, Safe, Accident-Free Workplace

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.

Tokuyama's Commitment to Safety and Accident Prevention

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 these basic safety principles, the Company carries out exhaustive measures for ensuring safety in manufacturing activities and at its facilities. Specifically, worksites conduct safety patrol operations and *kiken yochi* hazard prediction activities, practice the 5S principles, and use a point-and-call method for affirming onsite conditions. The Company is also working to improve its safety management system in order to prevent problems and accidents.



BCP drill at the Tokyo Head Office

Disaster Preparedness Drills

Tokuyama has also carried out various training activities. These include disaster drills for pipe leaks and fires caused by an earthquake, emergency drills at individual company divisions, joint drills involving affiliated companies and contractors, and workplace safety competitions. In 2016, to prepare against the possibility of a Tokyo inland earthquake, the Tokyo Head Office was designated as the disaster response headquarters and the Tokuyama Factory as the crisis response headquarters in the event an earthquake. The Company conducted drills for initiating its business continuity plan (BCP).

Maintaining Occupational Safety and Eliminating Accidents

Tokuyama experienced no accidents in fiscal 2016. In terms of occupational accidents, the Tokuyama Factory recorded one accident that required a work absence and two accidents without work absences, while the Kashima Factory and Tsukuba Research Laboratory recorded no accidents. Contractors at the Tokuyama Factory recorded two occupational accidents that required work absences. The Company will continue implementing safety initiatives in an effort to eliminate all accidents.

Tokuyama's Commitment to Occupational Health and Safety

Improving Safety Management Systems

All of Tokuyama's worksites conduct risk assessments covering operations, equipment, and processes, and continuously implement and make improvements in order to completely eliminate potential risks. In fiscal 2014, the Company improved safety management systems to ensure that every phase, from planning to result, is fully managed. The Company also strengthened its reporting on near-miss accidents and incorporated identified issues in its new risk assessments, and is now addressing these issues. In light of the serious accidents in recent years involving explosions and fires at chemical plants, Tokuyama has begun revising its risk assessment methods to take into consideration non-routine tasks (including unusual situations), since most of these accidents happened during irregular operations, such as facility maintenance work or emergency shutdowns and startups.

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 of operating procedures, and implementation of *kiken yochi* hazard prediction activities.

Promoting Sound Physical and Mental Health

At worksites where harmful substances are handled, Tokuyama ensures that local exhaust ventilation is kept



General disaster preparedness drill at the beginning of year

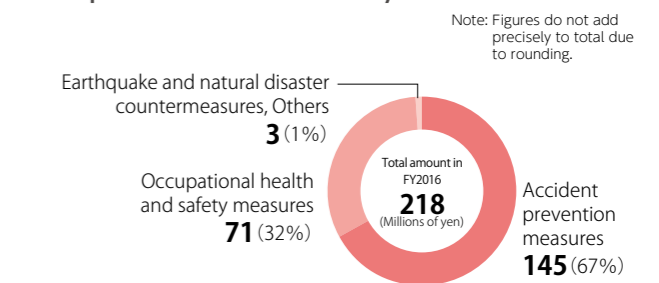
in proper working order, and has maintained its Working Environment Control Class I* certification.

To raise health awareness among employees, Tokuyama has its employees take part in a monthly Smart Life Program activity, which involves the filling out of a health improvement self-evaluation. In addition, Tokuyama provides its employees with one-on-one health counseling that incorporates the results of medical checkups.

As for mental health, the Company carries out Web-based diagnostic surveys of work-related stress for all employees, and provides support to employees who appear to need further attention.

* Control Class I: At almost all worksites (95% or more), the concentration of harmful airborne substances does not exceed the control concentration.

Expenditures for Accident Prevention and Occupational Health and Safety



Fiscal 2017 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 2017 Tokuyama Safety Management Objectives and Key Action Items

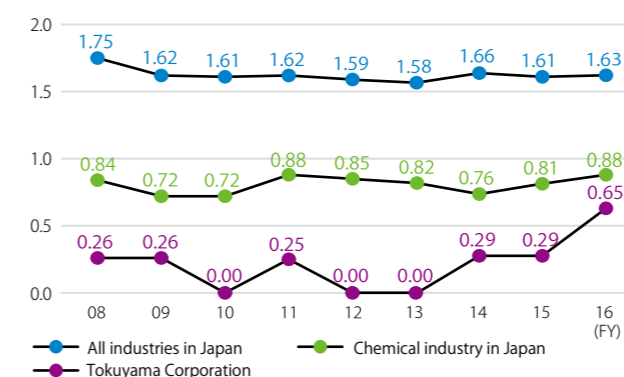
Policy Objectives

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

Key Action Items

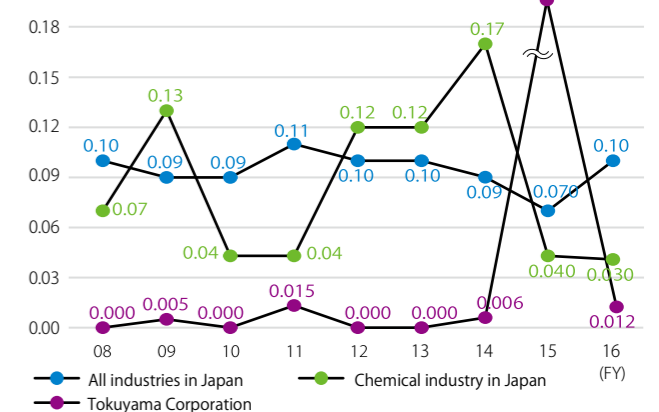
- Improve safety management
Conduct production floor patrols by upper management, raise hazard awareness, improve change management, comprehensively review the framework for safety education and training
- Identify sources of risks and resolve
Conduct risk assessments for irregular operations, respond to risk assessments for chemical substances and implement improvements
- Make progress in risk management and hazard management
Prepare for response to a potential major earthquake
- Promote facilities management
Enhance management of older facilities, expand efforts to identify facilities risks
- Promote physical and mental health

Comparison of Accident Frequency Rates *1



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

Comparison of Accident Severity Rates *2



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

Tokuyama's Environmental Management

Implementing Environmental Management to Reduce Environmental Impact

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 2016

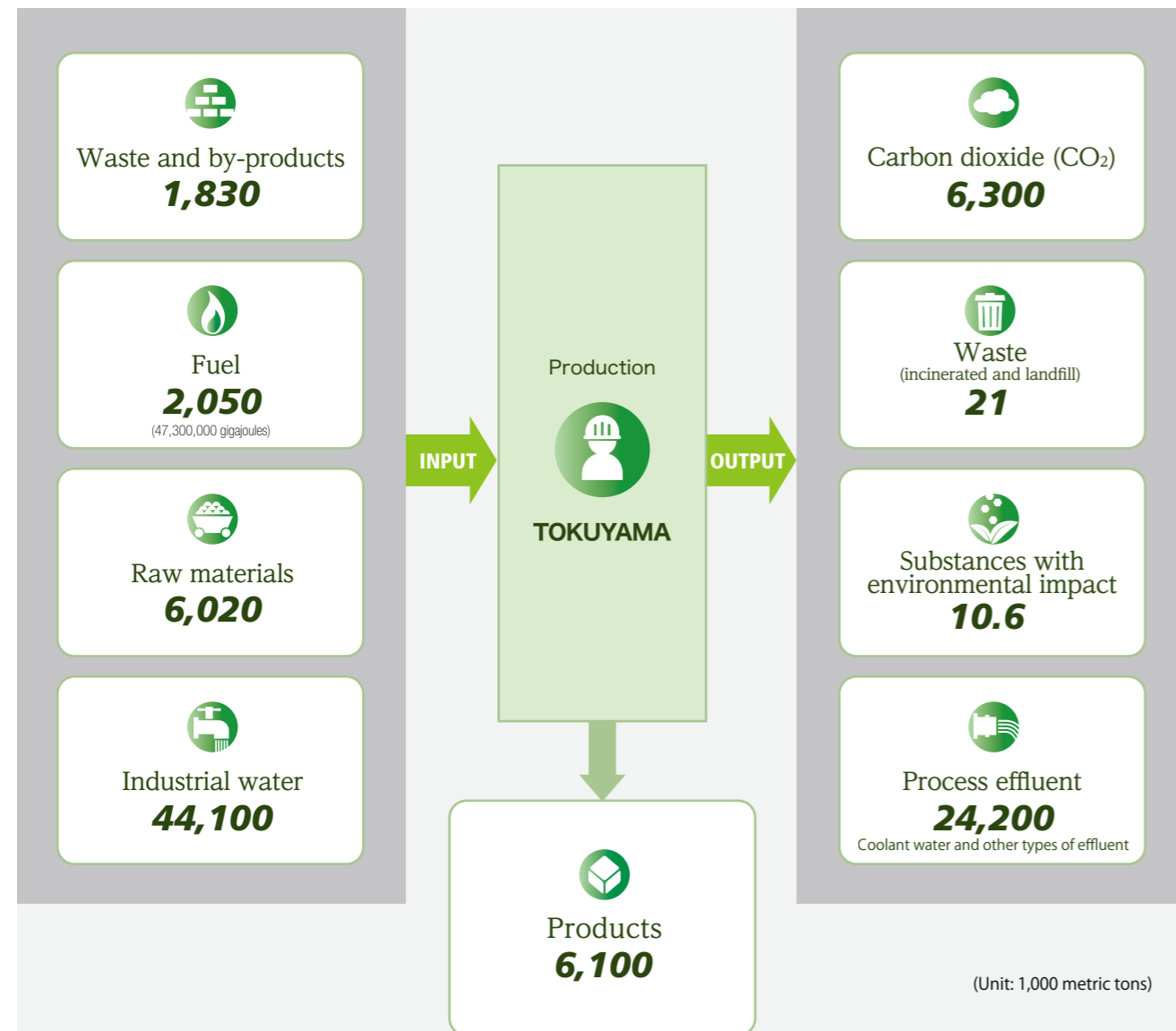
» Flow of Materials in Business Activities

Tokuyama works to accurately determine the input and output of materials for production, and regularly sets new targets aimed at reducing environmental impact. In fiscal 2016, Tokuyama achieved its per-unit energy consumption, waste recycling and zero emissions targets.

Regarding performance data for fiscal 2015 and beyond, Tokuyama has set a separate numerical management target for each department to maintain the current low-impact situation.

Flow of Materials in Business Activities

Note: All amounts are for Tokuyama Corporation on a non-consolidated basis in fiscal 2016



Results of Environmental Protection Initiatives by the Tokuyama Factory in Fiscal 2016

Symbols: ○ Goal achieved, × Goal not achieved

Category	Items	FY2016 Target	FY2016 Result	Rating	FY2017 Target	
Environmental Impact Reduction	Atmosphere	Soot	± 0	*	Maintain the current low-impact situation	
	Water Quality	COD	- 8%	*		
		Nitrogen	+ 57%	*		
		Phosphorus	- 7%	*		
	PRTR	PRTR	- 19%	*		
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	- 6.4%	○	0.8% reduction of per-unit energy consumption compared to fiscal 2005
Waste Reduction	Recycling	Effective utilization rate	Maintain at 94%	94.2%	○	Maintain at 92%
	Zero emissions	"Zero emissions" rate	Maintain at 99.9%	99.9%	○	Maintain at 99.9%

* 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 FY2015 results is shown.

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

Of Tokuyama's total environmental investment in fiscal 2016, 73% was for pollution control, followed by 12% intended for environment protection, and 10% for resource recycling. Meanwhile, in environmental costs in fiscal 2016, 67% of the total was generated by pollution control, 19% by resource recycling, and 6% by global environmental conservation. Major capital investment projects in fiscal 2016 included upgrading an electrostatic precipitator and the internal mechanisms of an organic plant reactor.

» Economic Benefits of Environmental Management

Economic benefits are determined by calculating only monetary gains on the reduction of energy consumption, the sale of valuable waste, the reduction in waste disposal costs through waste recycling, and the reduction in raw material and fuel costs through waste recycling. In fiscal 2016, the economic benefits remained flat year on year, at approximately ¥1.5 billion.

Measures to Help Combat Global Warming

Tokuyama participates in Keidanren's Voluntary Action Plan on the Environment, as a member of one of the

Environmental Preservation Costs

Category	Major Activities	Amount Invested (¥ million)	Costs (¥ million)	
Costs in Business Areas	Pollution Control	Installation of electrostatic precipitators and drainage conduits, replacement of tanks	1,032	3,804
	Global Environmental Conservation	Renewal of an air conditioner	173	360
	Resource Recycling	Upgrade of desalination equipment, PCB waste treatment expenditures, etc.	140	1,107
Upstream and Downstream Costs		0	0	
Management Activity Costs	Installation of environmental analysis equipment	45	241	
Research and Development Costs		15	0	
Social Activity Costs	Greenification and beautification measures Production of CSR report	0	73	
Costs for Environmental Damage	Imposition, management of a former mining site	0.4	101	
Total		1,405	5,688	

Economic Benefits in Fiscal 2016

Category	Material Benefit (1,000 metric tons)	Economic Benefit (¥ million)
Gains on Reduction in Energy Consumption	-	163
Gains on Sale of Valuable Waste	89	186
Gains on Reduction in Waste Disposal Costs through Waste Recycling	259	672
Gains on Reduction in Raw Material and Fuel Costs through Waste Recycling	260	469
Total	-	1,490

industries covered by the Action Plan. It is via this Action Plan that Tokuyama is working to achieve its 2020 emissions reduction target. Tokuyama is making steady progress in conserving energy throughout its business activities, and supporting efforts by employees to save energy at home.

» Promoting Energy Conservation

Tokuyama consumes a vast amount of energy to manufacture its core products such as caustic soda,

cement, and polycrystalline silicon. It also emits carbon dioxide (CO₂), one of the greenhouse gases, primarily in its burning of fossil fuels and decarboxylation of limestone, which is used as a raw material for cement production.

The Company is working to reduce CO₂ emissions by implementing energy conservation measures, including upgrading to more energy-efficient equipment. The Tokuyama Factory accounts for more than 99% of the Company's total energy consumption, and it has a target of reducing its per-unit energy consumption by 3.0% by fiscal 2020, from 2005 levels. The plant launched a project to study ways to reduce per-unit energy consumption in fiscal 2016. That same year, the plant's per-unit energy consumption was 6.4% below the 2005 level, continuing the declining trend from last year due in part to the high heating value of coal used in production.

» Addressing Global Warming through Initiatives at Offices

Tokuyama implements year-round, company-wide initiatives to conserve energy at offices, through strict application of temperature management for heating and cooling, lighting upgrades, and reduced computer energy consumption.

In March 2017, the Tokuyama Factory deployed an integrated system to collect, compress, transport, and use excess hydrogen, the first of its kind in Japan. The hydrogen is supplied to the Shunan Swimming Club facility, which is owned and operated by the Tokuyama Group, to operate pure hydrogen fuel cells that provide electricity and thermal energy to run the facility.



National and local government officials attend opening ceremony of factory's model system for local hydrogen production/use (Shunan City, Yamaguchi Prefecture).

» Amounts of Atmospheric Emissions

In order to reduce emissions of sulfur oxides (SOx), nitrogen oxides (NOx), and soot into the atmosphere, Tokuyama equips its boilers, cement kilns, and other facilities that generate these substances with emission control systems, including flue gas desulfurizers, denitration equipment, low-NOx burners, and high-performance dust collectors. In fiscal 2016, emissions of SOx and NOx

increased in accordance with higher operating rates for emitting facilities. Emissions of soot remained level year on year.

» Emissions of Pollutant Release and Transfer Register Substances

In fiscal 2016, Tokuyama and its group companies handled twenty-four substances that require mandatory registration under Japan's Pollutant Release and Transfer Register (PRTR)* system. The Company reduced emissions of PRTR substances through stable incineration and improvements at facilities, while also bringing down such emissions at group companies by paring the number of facilities that handled PRTR substances.

* 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 among the 12 substances subject to voluntary controls in Japan's Air Pollution Control Law. Accordingly, the Company has formulated a voluntary action plan and carries out ongoing measures for reducing the emissions of these substances.

» Measures to Reduce Dioxins

Tokuyama's waste oil incinerators and certain equipment in its vinyl chloride monomer manufacturing facilities are subject to regulations under Japan's Special Measures Law for Countermeasures against Dioxins. Accordingly, the Company measures the concentrations of dioxins in exhaust gases and wastewater emitted from these facilities to ensure that amounts are below regulatory limits.

» Amounts of Industrial Effluent and Wastewater

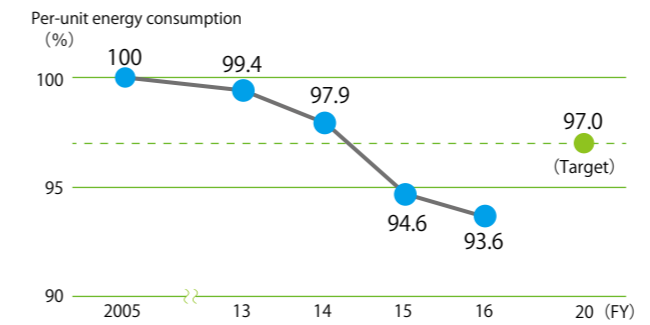
The Tokuyama Factory follows a stringent system for monitoring industrial effluent and purifying wastewater using treatment equipment in order to comply with regulatory standards and limits set by the local government, as well as the Company's own standards, which are even stricter. The factory also 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 2016, COD and phosphorus emissions remained level year-on-year. Nitrogen emissions

increased due to malfunctioning of wastewater treatment equipment.

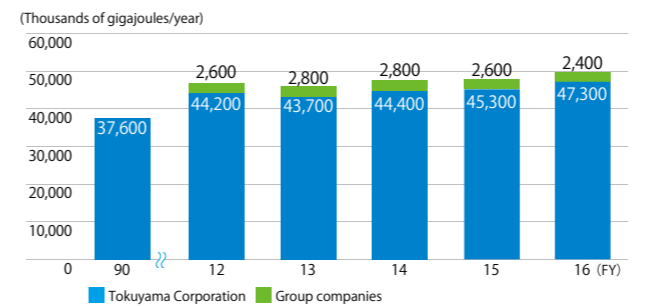
* Chemical oxygen demand is an indicator used to measure water quality, and refers to the amount of oxygen required to oxidize organic compounds in water.

Unit Energy Consumption Index* (Tokuyama Factory)

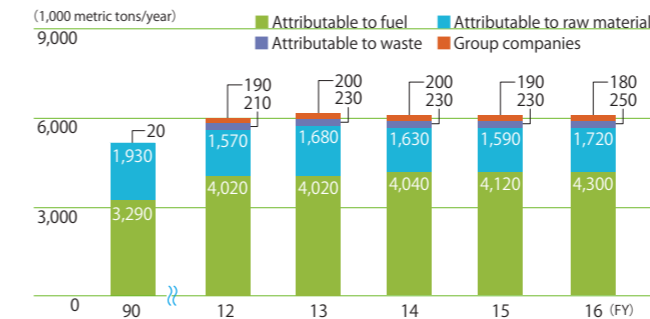


* The unit energy consumption index is calculated using a method recommended by the Japan Chemical Industry Association (JCIA).

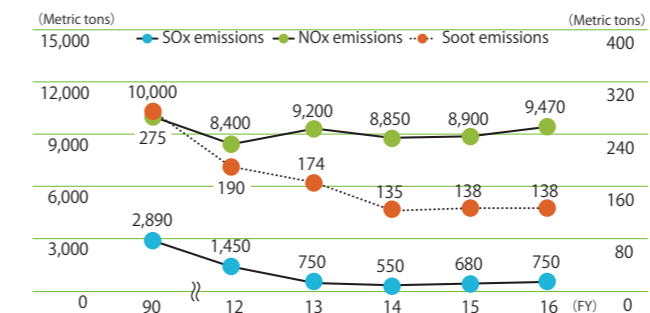
Energy Consumption



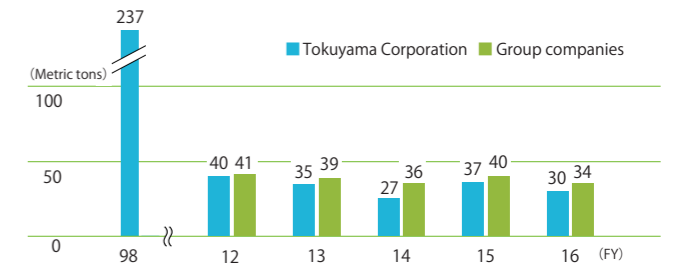
CO₂ Emissions



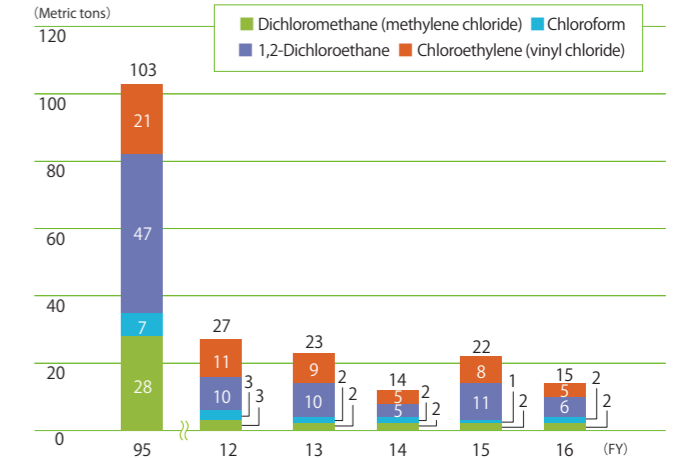
SOx, NOx and Soot Emissions



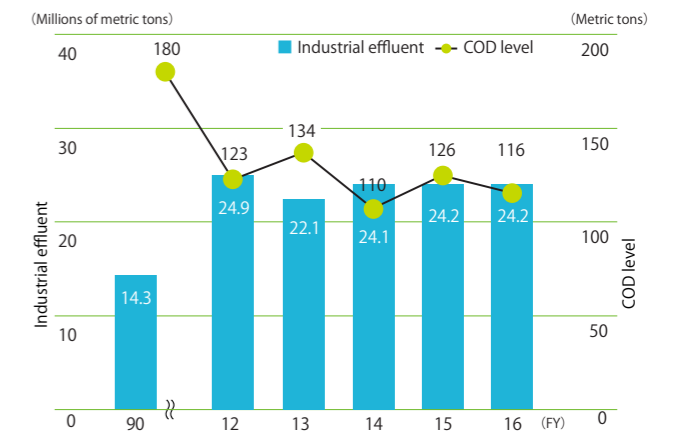
PRTR Substance Emissions



Hazardous Air Pollutant Emissions



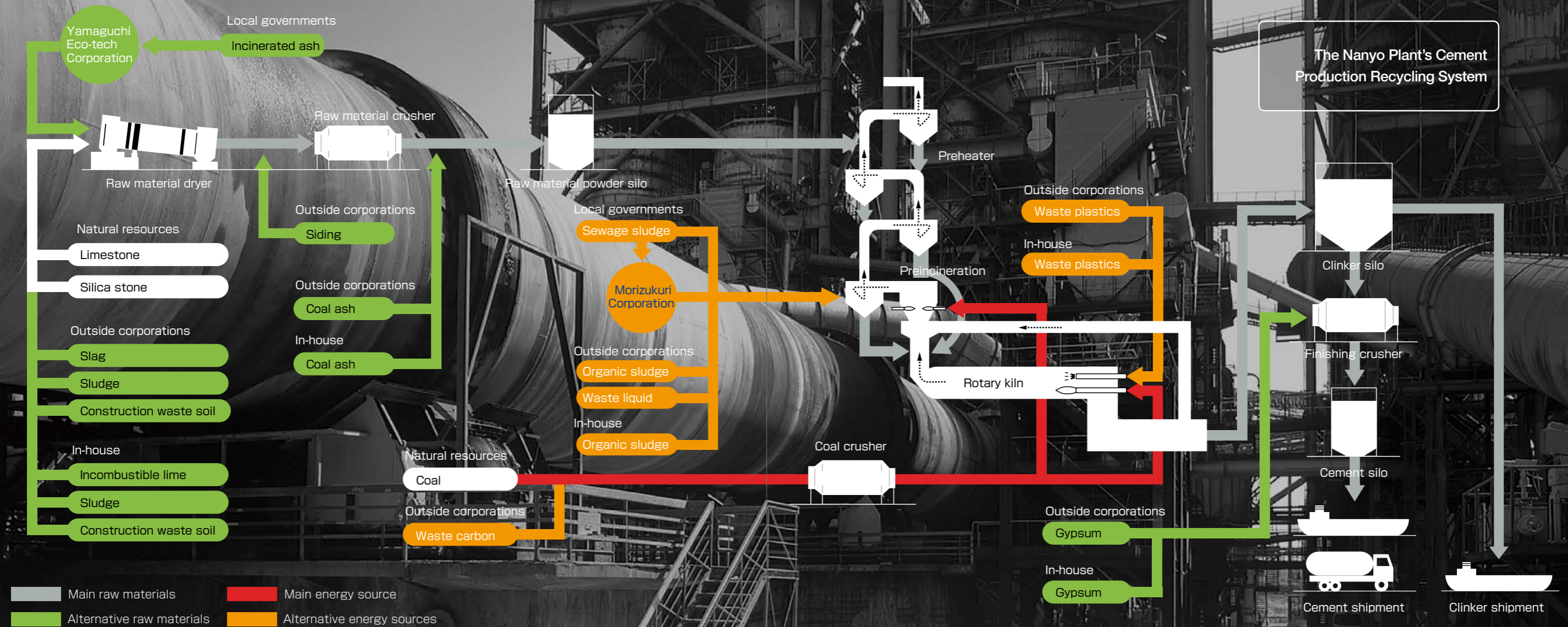
Industrial Effluent Amounts and COD Levels



Nitrogen and Phosphorus Emissions

	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Nitrogen	94	70	89	92	145
Phosphorus	2.7	2.4	2.6	2.2	2.1

Environment / Safety



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

Recycling and Reducing Waste

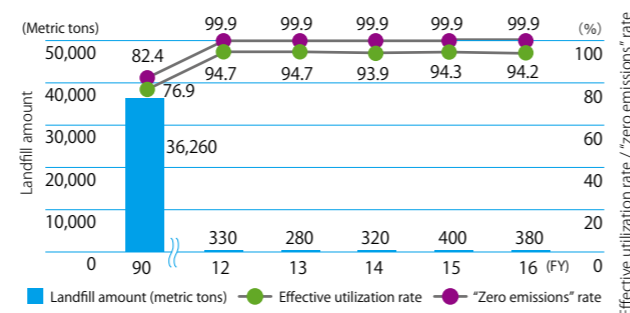
Tokuyama makes exhaustive efforts to reduce and recycle the waste it generates. As a result, the Company maintained a 94% effective utilization rate of waste and again hit its “zero emissions” target of 99.9% in fiscal 2016.

Waste Management

Tokuyama generated a total of 377,000 metric tons of waste in fiscal 2016. It actively worked to recycle this waste both in and outside the Company, mainly by re-using waste matter as raw materials and fuel for cement at the Tokuyama Factory. In addition, packing materials, pallets and other wood waste were crushed and then used as fuel for power plants. Through its

diligent efforts to recycle waste as raw material for cement, Tokuyama achieved an effective utilization rate of 94%, on par with the previous fiscal year. Moreover, owing to progress made in reusing waste and reducing the amount generated, the Company again achieved its “zero emissions” target of 99.9% in fiscal 2015.

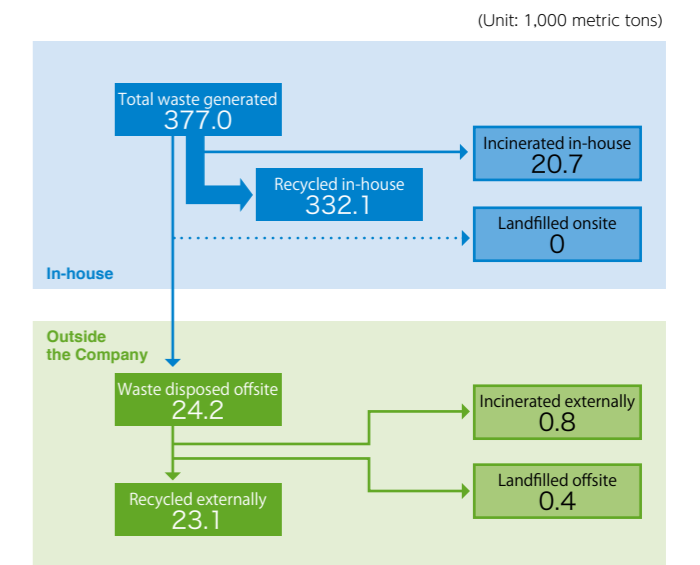
Amount of Waste Sent to Landfills and Rate of Effective Utilization



Breakdown of Industrial Waste Treatment in Fiscal 2016



Flow of Industrial Waste Treatment



Working with Employees

Embracing Diversity to Build Workplaces with Equal Opportunities

Tokuyama embraces diversity and strives to enable employees to realize their full potential. This allows the Company to adapt to the constantly changing business landscape and meet the needs of customers. At the core of Tokuyama's commitment to diversity is supporting equal opportunities for women to make the most of their potential, which, in turn, will enhance corporate value.

Action Plan to Promote Opportunities for Women

Tokuyama is implementing an action plan to promote equal opportunities for women, working to achieving four specific goals by the end of fiscal 2020.

The Company has set specific targets for the percentage of women employed among its new university graduate hires. It met the targets in both fiscal 2016 and 2017. Moving forward, the Company is looking to hire more women to work as operators on the production floor. To increase the percentage of managerial positions held by women, the Company offered career planning sessions for all female employees up to age 35. In these sessions, employees reviewed their careers and each formulated a career vision and goals for the next three years. These

Building a Corporate Culture That Helps Employees Reach Their Full Potential

Manager, Human Resources Group Naoki Fujiwara



In our DIM initiatives in fiscal 2017, we set several goals: to build a corporate culture that embraces diversity; to encourage process innovation in our departments; and to establish a platform to enhance corporate value. Meanwhile, we always strive to support employees' efforts to realize their full potential.

A key aspect of our programs is supporting equal opportunities for women, so that every employee—woman or man—can thrive and contribute.



*Diversity & Inclusion Management (DIM): Tokuyama seeks to create an environment where all employees can fully utilize their talents and achieve growth, which in turn will make the organization as a whole more vital and creative.

women also received letters stating the expectations of their direct supervisors, in an effort to involve these managers more closely in women's career development.

Tokuyama Corporation Action Plan to Promote Opportunities for Women

Duration: April 1, 2016–March 31, 2020

Target and Strategies	Performance
<p>① Ensure that women account for no less than 20% of all persons with at least a university undergraduate degree who are hired for career-track positions.</p> <p>(3-year moving average)</p> <p>Since April 2016</p> <ul style="list-style-type: none"> Strengthen recruitment of women among university graduates Increase awareness of workforce reentry program* 	<p>50% (FY2015) 25% (FY2016) 25% (FY2017)</p> <p>Program participants: 6 employees</p>
<p>② Ensure that women account by 2020 for no less than 6% of all assistant managers.</p> <p>Since April 2016</p> <ul style="list-style-type: none"> Implement career planning education (raise awareness) <p>Since April 2017</p> <ul style="list-style-type: none"> Encourage participation in skills development training 	<p>5.6% (April 2017)</p> <p>Implemented in Tokyo and Tokuyama in October and November 2016 (for 47 employees)</p>
<p>③ Ensure that women account by 2020 for no less than 2% of all managers.</p> <p>Since April 2017</p> <ul style="list-style-type: none"> Implement skills development training for future managers Study the adoption of a mentor program 	<p>1.3% (April 2017)</p>
<p>④ Ensure that women by 2020 hold at least 10 sales positions and 20 positions in manufacturing departments.</p> <p>Since April 2016</p> <ul style="list-style-type: none"> Interview general managers in sales and manufacturing to identify issues that impede equal opportunities for women, and address the issues Communicate information concerning equal opportunities for women and implement initiatives to raise awareness <p>Since April 2017</p> <ul style="list-style-type: none"> Use management training to change attitudes among male managers 	<p>Implemented</p> <p>Implemented</p>

* The workforce reentry program is designed to support women who wish to reenter the workforce and continue their careers.

Tokuyama is also taking steps to remove cultural obstacles to women holding certain job positions, for instance, by surveying general managers in sales and manufacturing operations and asking them to identify issues that could impede equal opportunities for women. The surveys confirmed that managers were receptive to having more women work in sales and manufacturing

departments. The Company also conducts seminars almost every month to provide employees who have only worked in one department with exposure to the broad range of careers available within the Company, while also working with departments to expand women's involvement in more job positions.

Working with Colleagues to Build a Workplace with Equal Opportunities for Men and Women

Megumi Nomura

Assistant Manager, Chemicals Quality Assurance Department

I started my career at Tokuyama as a non-management track employee at the Osaka Branch, working in sales administration. I was traveling on company business half the month and working just as much as management track employees. It made sense to become a management track employee to further develop my abilities.

Then, as a management track employee, I worked in the same sales department, dealing with the same products and customers, which enabled me to leverage my skills.

Subsequently, I requested a transfer to a new workplace. I had become more knowledgeable about our products and manufacturing processes via my sales work, so I thought that I could use my experience to be of benefit on the production floor.

Today, my main duty is implementing quality assurance for chemical products, including technical studies to meet customer requests. When a customer asks us to investigate the traceability of a product, I am able to use the systems



knowledge I gained working in sales to track the manufacturing history using our product management system and identify causes.

As part of the Chemicals Quality Assurance Department, I will keep taking on new challenges and work to help build a company where both women and men can make the most of their potential.

Community Service Activities

Over 30 Years of Employee Volunteering

Tokuyama employees go beyond corporate-level initiatives to give their own time to community engagement.

Some Tokuyama employees formed a volunteer group in 1983 in order to engage with residents around the Company's workplace. After 33 years, this group is still working closely with the community.

In 2016, the group donated rice and arranged a *mochi* (rice cake) pounding event for the Shirohato Gakuen facility for persons with disabilities, where they shared rice cake soup with the residents. Employees were also involved in a Christmas party at the Nozomi no Ie facility for persons with disabilities,



Tokuyama employees pound *mochi* with residents of the Shirohato Gakuen facility for persons with disabilities

where they delivered a donation and gave presents to the residents. The group also performed a theatrical play and enjoyed various performances and games with their families.

The volunteer group will continue working to expand its activities in order to bring even more smiles to Tokuyama's local friends and neighbors.

Third-Party Review

A Review of Tokuyama's CSR Report 2017



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

» 100 Years in Business, Adding Value to Society

In 2018, the Tokuyama Group will reach a landmark of 100 years in business. The lead feature in this report describes the soda ash business that has sustained the Company since its founding, communicating the Company's pride as the sole manufacturer of soda ash in Japan with human resources drawing on a century of expertise. This is followed by another feature on the generic API business, where the Company is leveraging technologies it has developed over the last century to expand into new areas that have a positive impact on society. The Tokuyama Group is generating balanced sales from its four existing business segments and aims to leverage its strengths in the fields of ICT, healthcare, and environment.

In the Vision of Tokuyama announced in fiscal 2016, the Company outlined the following mission over the next century: "Centered on the field of chemistry, the Tokuyama Group will continue to create value that enhances people's lives." This report does a good job of communicating how the Company has been realizing this mission.

» Creating Value to Address Social Issues

It is critical for the Tokuyama Group to define who it is creating value for. In today's globalized society, the Company must define the ways in which it can address the massive issues facing the international community. Based on the Sustainable Development Goals (SDGs), which include 17 goals and 169 targets, the Tokuyama Group should identify specific items to address and communicate the progress it is making to the public. Wherever possible, the Company should quantify the value it is creating and share the figures with the public, thus fostering dialogue with investors and other stakeholders.

» Disseminating Information

In the Vision of Tokuyama, the Company has ambitiously defined the fields in which it will create value for society. However, the report could be clearer about the Company's strengths and the value it is creating by using less technical terms. Explaining the terminology and improving the readability would enable readers to better understand what the Tokuyama Group is doing. It would also foster a better connection with the public and enhance public understanding of the Company.

Group will continue to create value that enhances people's lives." The feature articles in the report focus on the soda ash and generic API businesses, the former having sustained the Company for the last 100 years, with the latter positioned for the next century. We highlighted these contrasting businesses to communicate the Company's value to society.

Regarding our efforts to create value to realize sustainable growth, we will take seriously the advice to examine the SDGs and consider specific future actions.

Responding to the feedback that the report was overly technical and difficult to understand, we will strive to make next year's report even more customer-focused and accessible to stakeholders.

Response to Third-Party Review

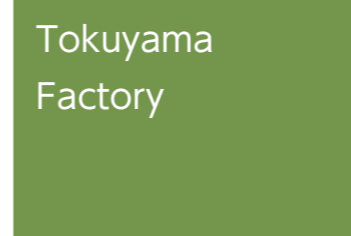


Takeshi Nakahara

Director, Managing Executive Officer Corporate Social Responsibility Division

The Tokuyama Group created the CSR Report 2017 to describe its efforts to fulfill its corporate mission: "Centered on the field of chemistry, the Tokuyama

Site Reports



Location: 1-1, Mikage-cho, Shunan-shi, Yamaguchi 745-8648, Japan
 Number of employees: 1,521
 Total site area: 1.91 million m²
 Main products: Cement, inorganic chemical products, organic chemical products, polycrystalline silicon, fumed silica, polyvinyl chloride, and other products



Hideki Adachi
Tokuyama Factory General Manager

Still situated at the Company's first business site, the Tokuyama Factory is the Group's main manufacturing facility, and its products account for about 90% of non-consolidated sales. The factory operates with the motto, "Go to work healthy and return home happy." Aiming to achieve 6.0 million accident-free hours at the factory and 9 million accident-free hours at its contractors, the factory is working hard to keep everyone on site happy and safe at work. In fiscal 2017, the factory's top priorities are to; (1) Identify and eliminate risks in the handling of hazardous substances and relating to falling accidents; (2) conduct active dialogue on safety in order to remove the root causes of continued risks on the production floor; (3) recognize changes in facilities and operations to identify and eliminate risks through hazard prediction on the production floor; and (4) conduct hands-on hazard training for all employees and comprehensively implement pointing and calling for safety at crosswalks in facilities.



* In line with revisions to the Act on the Rational Use of Energy, calorific and other values from 1990 to the present have been recalculated.

Performance Data

	Unit	FY2012	FY2013	FY2014	2FY015	2FY016
SOx emissions	Metric tons	1,450	750	550	680	750
NOx emissions	Metric tons	8,400	9,200	8,850	8,900	9,500
Soot emissions	Metric tons	190	174	135	138	138
Industrial water consumption	Million metric tons	41.3	42.2	41.7	42.1	44.1
Effluent discharged	Million metric tons	24.8	22.1	23.9	24.2	24.2
COD level	Metric tons	119	132	110	124	114
Total nitrogen discharged	Metric tons	94	70	89	92	145
Total phosphorous discharged	Metric tons	2.7	2.4	2.6	2.2	2.1
PRTR-designated substance emissions	Metric tons	39	33	25	36	29
Waste generated	Thousand metric tons	381	395	354	389	376
Waste sent to landfills	Metric tons	320	277	313	383	368
Energy consumption	Thousand gigajoules	44,100	43,700	44,200	45,100	47,100
CO ₂ emissions (originating from fossil fuel)	Thousand metric tons	4,020	4,020	4,040	4,110	4,290
Complaints	Cases	0	1	0	1	0

Emissions and Transfer of Specific PRTR-Designated Substances in Fiscal 2016

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	6.4	0.0	0.0	6.4	1.3
Chloroethylene (vinyl chloride)	94	5.4	0.0	0.0	5.4	0.0
Chlorodifluoromethane	104	2.4	0.0	0.0	2.4	0.0
Chloromethane (methyl chloride)	128	2.4	0.0	0.0	2.4	0.0
Toluene	300	2.2	0.0	0.0	2.2	8.0
Cresol	86	0.0	2.2	0.0	2.2	0.0
Dichloromethane (methylene chloride)	186	1.9	0.0	0.0	1.9	0.0
Water-soluble compounds of zinc	1	0.0	1.2	0.0	1.2	0.0
1-Bromopropane	384	1.1	0.0	0.0	1.1	0.0
Chloroform	127	0.9	0.0	0.0	0.9	0.0
1,2-Epoxypropane (propylene oxide)	68	0.6	0.0	0.0	0.6	2.7
1,2-Dichloropropane	178	0.4	0.0	0.0	0.4	217.7
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
Hydrazine	333	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	0.2
Dioxins	243	3.0	1.4	0.0	4.5	0.0
Total (excluding dioxins)		23.7	3.4	0.0	27.1	229.9

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

Water refers to public waters

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

Total figures have been rounded to the first decimal place

Site Reports

Kashima Factory

Location: 26 Sunayama, Kamisu-shi, Ibaraki 314-0255, Japan
 Number of employees: 81
 Total site area: 101,000m²
 Main products: Produced by Tokuyama Corporation
 Bulk pharmaceuticals for stomach and duodenal ulcer treatment drugs, and diabetes drugs; optical materials (plastic lens monomer, light modulating materials, and hard coating solutions); raw materials for electronic materials; metal cleaners
 Produced by Tokuyama Dental Corporation
 Dental materials (restorative materials, adhesives, relining materials, impression materials and investment materials)



Yoshiyuki Kitajima
Kashima Factory General Manager



The Kashima Factory strives to recycle waste matter while placing the utmost importance on the proper management and handling of chemical substances. As a result of this approach, the factory achieved an 78% effective utilization rate of waste in fiscal 2016. Waste sent to landfills for final disposal amounted to 9 metric tons. "Zero emissions" amounted to 99%. Looking ahead, the Kashima Factory is examining the feasibility of material and thermal recycling as it works to increase its effective utilization rate for all types of waste matter.

Performance Data

	Unit	FY2012	FY2013	FY2014	FY2015	FY2016
Industrial water consumption	Thousand metric tons	76	51	48	43	36
Effluent discharged	Thousand metric tons	96	66	63	54	50
COD level	Metric tons	4	3	3	2	2
PRTR-designated substance emissions	Metric tons	1	2	2	2	2
Waste generated	Metric tons	930	919	1,020	735	775
Waste sent to landfills	Metric tons	7	7	11	20	9
Energy consumption*	Thousand gigajoules	59	36	36	33	37
CO ₂ emissions (originating from fossil fuel)*	Metric tons	2,399	2,476	2,465	2,246	2,670
Complaints	Cases	0	0	0	0	0

* In accordance with a revision of Japan's Act on the Rational Use of Energy, figures based on calorific values and other factors have been recalculated retrospectively to 1990.

Emissions and Transfer of Specific PRTR-Designated Substances in Fiscal

Unit: metric tons

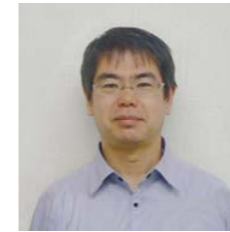
Substance Name	Regulatory Number	Amount of Emissions				Amount Transferred
		Atmospheric	Water	Soil	Subtotal	
Chloroform	127	0.8	0.0	0.0	0.8	14.5
Toluene	300	0.5	0.0	0.0	0.5	23.2
Dichloromethane	186	0.4	0.0	0.0	0.4	2.0
Acetonitrile	13	0.0	0.0	0.0	0.0	0.5
1,4-Dioxane	150	0.0	0.0	0.0	0.0	0.0
N,N-Dimethylacetamide	213	0.0	0.0	0.0	0.0	2.0
N,N-Dimethylformamide	232	0.0	0.0	0.0	0.0	5.7
2-Vinylpyridine	338	0.0	0.0	0.0	0.0	0.5
Methyl methacrylate	420	0.0	0.0	0.0	0.0	0.0
Total		1.7	0.0	0.0	1.7	48.4

Notes: All figures are the numerical sum for Tokuyama Corporation and Tokuyama Dental Corporation. Substances are listed in descending order of emissions levels; substances with no emissions are listed in order of the regulatory number

Water refers to public waters
 Amount transferred indicates the sum of the quantity transferred to sewage systems and the quantity subject to intermediate treatment
 Total figures have been rounded to the first decimal place

Sun · Tox Co., Ltd.

Established: February 14, 1992
 Shareholder: Tokuyama Corporation (80%), Rengo Co., Ltd.(20%)
 Head office: Akasaka Enoki-zaka Mori Building, 1-7-1 Akasaka, Minato-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: 197
 Total site area: 89,800m²

Kanto Plant

Sun · Tox's Kanto Plant manufactures biaxial-oriented polypropylene films and cast polypropylene films, which are used for food packaging and other applications, totaling about 29,000 metric tons annually. As a Type 1 Designated Energy Management Factory under the Japan's Act on the Rational Use of Energy, the Kanto Plant strives to cut down on its overall energy consumption on a per-unit basis.

Sun · Tox upgraded its gas cogeneration facilities with a higher-efficiency system. Moving forward, the company will further reduce energy consumption and environmental impacts. As it continues to implement three management systems, namely Japan's Occupational Safety and Health Management System (OSHMS), ISO 14001, and ISO 9001, the Kanto Plant is building on its achievements with the aim to be a community-based factory.

Performance Data

	Unit	FY2012	FY2013	FY2014	FY2015	FY2016
Waste generated	Metric tons	26	15	20	15	23
Waste sent to landfills	Metric tons	7	4	10	5	10
Energy consumption	Thousand gigajoules	340	360	351	356	356
CO ₂ emissions	Thousand metric tons	19	20	20	21	21
SOx emissions	Metric tons	0.3	0.2	0.3	0.3	0.1
NOx emissions	Metric tons	0.6	0.7	0.6	0.7	0.4
Soot emissions	Metric tons	0.03	0.06	0.05	0.04	0.02

Tokuyama Plant

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

Performance Data

	Unit	FY2012	FY2013	FY2014	FY2015	FY2016
Waste generated	Metric tons	67	66	76	74	84
Waste sent to landfills	Metric tons	2	2	1	1	1
Energy consumption	Thousand gigajoules	445	463	458	471	463
CO ₂ emissions	Thousand metric tons	26	27	27	27	28
PRTR-designated substance emissions	Metric tons	0.0	0.0	0.0	0.0	0.0
Complaints	Cases	0	0	0	0	0



Nobuhiko Nakayama
Plant Manager



Location: 7-7, Harumi-cho, Shunan-shi, Yamaguchi, Japan
 Number of employees: 147
 Total site area: 24,100m²

Site Reports

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

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 resin window frames, which are highly effective for saving energy. The plant practices ISO 14001 environmental management, and ensures safety and prevents accidents by having all employees participate in activities designed to eliminate problems, identify near-miss situations, and practice the 5S principles. Owing to this approach, the plant has maintained an accident- and disaster-free record for 17 years since its establishment. In fiscal 2017, the plant intends to strictly enforce internal controls while carrying out Responsible Care activities based on a safety-first policy for all operations.



Location: 1-2 Harumi-cho, Shunan-shi, Yamaguchi, Japan
 Number of employees: 27 / Total site area: 3,280m²

Performance Data

	Unit	FY2012	FY2013	FY2014	FY2015	FY2016
Power consumption	Thousand kilowatt hours	2,455	2,562	2,473	2,659	2,490
Waste plastic produced	Metric tons	107	125	108	141	135
Waste plastic effectively used	Metric tons	107	124	105	141	135
Waste sent to landfills offsite for disposal	Metric tons	15	7	8	6	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
 Shareholder: Tokuyama (50%), Prime Polymer Co., Ltd. (50%)
 Location: 1-1 Harumi-cho, Shunan-shi, Yamaguchi, Japan
 Business activities: Manufacture and sale of polypropylene resin and flexible polypropylene resin



Yuichi Taguchi
Plant Manager

Tokuyama Plant

Tokuyama Polypropylene's Tokuyama Plant conducts risk assessments of processes, facilities, and operations, and takes measures to identify near-miss situations and points of concern, in order to enhance the plant's safety culture. The result has been a perfect accident- and disaster-free record since the time it was first established as Tokuyama's polypropylene film business 41 years ago. The plant is scheduled to obtain recertification in 2017 under the High Pressure Gas Safety Act and the Ordinance on Safety of Boilers and Pressure Vessels, and is pursuing Responsible Care activities with the goals of extending its accident- and disaster-free record, reducing its environmental impact, and eliminating customer complaints related to quality.



Location: 1-1 Harumi-cho, Shunan-shi, Yamaguchi, Japan
 Number of employees: 62 / Total site area: 70,997m²

Performance Data

	Unit	FY2012	FY2013	FY2014	FY2015	FY2016
Industrial water consumption	Thousand metric tons	343	411	308	370	333
Waste generated	Metric tons	160	116	89	35	77
Waste sent to landfills	Metric tons	1.9*	15	2.4*	0	1.8*
Unit energy consumption index (fiscal 2002=100)	%	88	84	76	71	73

* Year with periodic maintenance

Detailed Data

Environmental Data for Tokuyama

Input (Unit: 1,000 metric tons)	FY2012	FY2013	FY2014	FY2015	FY2016	Comparison with the previous fiscal year (%)
Waste and by-products	1,780	1,945	1,790	1,780	1,830	+1.0
Fuel	2,150	1,760	1,820	1,810	2,050	+13.3
Raw materials	5,650	6,080	5,900	5,990	6,020	+0.5
Industrial water	41,300	42,200	41,700	42,100	44,100	+4.8
Output (Unit: 1,000 metric tons)	FY2012	FY2013	FY2014	FY2015	FY2016	Comparison with the previous fiscal year (%)
Carbon dioxide	5,800	5,930	5,910	6,000	6,300	+5.0
Waste (incinerated and landfill)	20	21	22	22	21	-4.5
Substances with environmental impact	10	10	9.7	9.9	10.6	+7.0
Process effluent	24,900	22,100	24,000	24,200	24,200	0.0

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

Unit: %	Base year (FY2005)	FY2013	FY2014	FY2015	FY2016	Target (FY2020)
Per-unit energy consumption	100.0	99.4	97.9	94.6	93.6	97.0

* The factory has been working since 2014 to reduce per-unit energy consumption in fiscal 2020 by 3.0% compared to the fiscal 2005 level.

Energy Consumption

Unit: 1,000 gigajoules	Base year (1990)	FY2012	FY2013	FY2014	FY2015	FY2016
Tokuyama Corporation	37,600	44,200	43,700	44,400	45,300	47,300
Group companies	—	2,600	2,800	2,800	2,600	2,400

Emissions of CO₂

Unit: 1,000 metric tons	Base year (1990)	FY2012	FY2013	FY2014	FY2015	FY2016
Originating from fuel	3,290	4,020	4,020	4,040	4,120	4,300
Originating from raw materials	1,930	1,570	1,680	1,630	1,590	1,720
Originating from waste matter	20	210	230	230	230	250
Group companies	—	190	200	200	190	180

Emissions of SO_x, NO_x, and Soot

Unit: Metric tons	FY2012	FY2013	FY2014	FY2015	FY2016	Comparison with the previous fiscal year (%)
SO _x	1,446	749	554	677	751	+10.9
NO _x	8,400	9,200	8,850	8,900	9,470	+6.4
Soot	190	174	135	138	138	0.0

Emissions of PRTR-Designated Substances

Unit: Metric tons	Base year (1998)	FY2012	FY2013	FY2014	FY2015	FY2016
Tokuyama Corporation	237	40	35	27	37	30
Group companies	—	41	39	36	40	34

Detailed Data

Emissions of Hazardous Air Pollutants

Unit: Metric tons	Base year (1995)	FY2012	FY2013	FY2014	FY2015	FY2016
Dichloromethane (methylene chloride)	28	3	2	1.5	1.7	2.3
Chloroform	7	3	2	2.1	1.1	1.7
1,2-Dichloroethane	47	10	10	4.9	10.6	6.4
Chloroethylene (vinyl chloride)	21	11	9	5	7.7	5.4

Discharge of Industrial Effluent and Levels of COD

	Base year (1990)	FY2012	FY2013	FY2014	FY2015	FY2016
Industrial effluent (million metric tons)	14.3	24.9	22.1	24.1	24.2	24.2
COD (metric tons)	180	123	134	112	126	116

Discharge of Nitrogen and Phosphorous

Unit: Metric tons	FY2012	FY2013	FY2014	FY2015	FY2016	Comparison with the previous fiscal year (%)
Nitrogen	94	70	89	92	145	+57.6
Phosphorous	2.7	2.4	2.6	2.2	2.1	-4.5

Landfilled and Recycled Waste

	Base year (1990)	FY2012	FY2013	FY2014	FY2015	FY2016
Landfilled waste (metric tons)	36,260	330	280	320	400	380
Effective utilization rate (%)	76.9	94.7	94.7	93.9	94.3	94.2
"Zero emissions" rate (%)	82.4	99.9	99.9	99.9	99.9	99.9

Breakdown of Waste Treatment Methods

Unit: 1,000 metric tons	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016
Waste recycled in-house	331	337	350	312	346	332
Waste recycled externally	27.3	25	24.5	21.9	21.4	23.1
Incinerated waste	21	19.7	20.5	21.3	21.9	21.5
Waste sent to landfills	0.5	0.3	0.3	0.3	0.4	0.4
Total waste generated	380	382	396	355	389	377

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

Unit: Kg per metric ton of cement	Base year (FY1991)	FY2012	FY2013	FY2014	FY2015	FY2016
Amount used	227	458	461	448	459	441

Material and Thermal Recycling Amounts in Cement Production

Unit: 1,000 metric tons	Base year (FY1991)	FY2012	FY2013	FY2014	FY2015	FY2016
Material recycling	1,550	1,730	1,879	1,702	1,711	1,746
Thermal recycling	4	54	66	86	74	84

Aerial View of the Tokuyama Factory



Company Outline

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, Nagoya Branch, Shunan Sales Branch

President: Hiroshi Yokota

Established: February 16, 1918

Capital: ¥10 billion (as of June 30, 2017)

Number of employees: 5,406 (consolidated basis; including 1,141 working overseas); 1,869 (non-consolidated basis) (as of March 31, 2017)

Number of group companies: 79 (as of March 31, 2017)

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: Fine chemicals, microporous films, synthetic resins, ion exchange membranes and dental materials

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

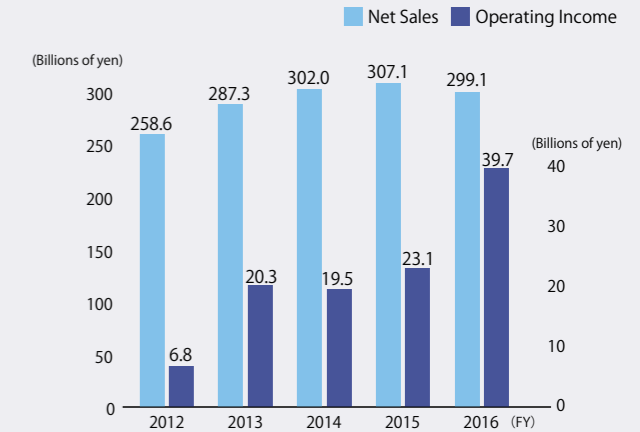
Global Network

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

■ ... Manufacture and sales ● ... Sales

Financial Highlights

Net Sales and Operating Income [Consolidated]



Fiscal 2016 Sales by Business Segment

Note: Segment sales results include inter-segment sales

