



Materials can change  
our lives.

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## Message from the President

President, Toray Industries, Inc

*Akihiro Nishikawa*



**Contributing to society through the creation of new value with innovative ideas, technologies and products**

### Supporting Society in Every Era

Humanity today faces a multitude of challenges when it comes to the natural environment. Problems like climate change, water scarcity, and resource depletion are becoming more and more severe. These and many other issues must be resolved if humanity is to build a sustainable world that can support future generations in an era of increasing populations and aging demographics. Companies are expected to take steps above and beyond national and regional frameworks, tackling the global issues addressed by the Paris Agreement on climate change and the Sustainable Development Goals (SDGs) adopted at the United Nations.

Since the very founding of the Toray Group, our fundamental mission has been to contribute to society, and we formalized this as our company principle in 1955. This same commitment is now captured by our corporate philosophy, “Contributing to society through the creation of new value with innovative ideas, technologies and products.” After all, every product people use is made from materials—and we believe materials can change lives. This conviction

underpins our commitment to being the kind of company that can support society in every changing era. We aim to do this by leveraging our core technologies to create innovative materials to help solve the challenges the world faces, and fulfilling our responsibilities as a public institution.

Since fiscal 2017, in line with our long-term corporate vision, AP-Growth TORAY 2020, we have been executing our medium-term management program, Project AP-G 2019. One of our key strategies is to expand businesses in growth fields. Under this strategy, the entire Toray Group is focusing on Green Innovation businesses, which contribute solutions for environmental, resource, and energy issues, and our Life Innovation businesses, which enhance the quality of medical care and contribute to health maintenance and longevity. In addition, in July 2018 we established the Toray Group Sustainability Vision, which includes specific initiatives to help create the world envisioned by the Toray Group by 2050 as well as quantitative targets for 2030. The Vision also lays out our long-term determination to provide innovative technologies and advanced materials to help address global issues.

At the Toray Group, we integrate corporate social responsibility into our management strategies, recognizing that the CSR perspective is essential to delivering a sustainable business and social growth. Social responsibility is a top priority for Toray Group management. Under our Sixth CSR Road Map, which covers the same period of time as Project AP-G 2019, we are carrying out initiatives in areas such as corporate ethics and legal compliance, human rights promotion and human resources development, and safety, accident prevention, and environmental preservation.

## **Reinforcing Product Quality Assurance Compliance**

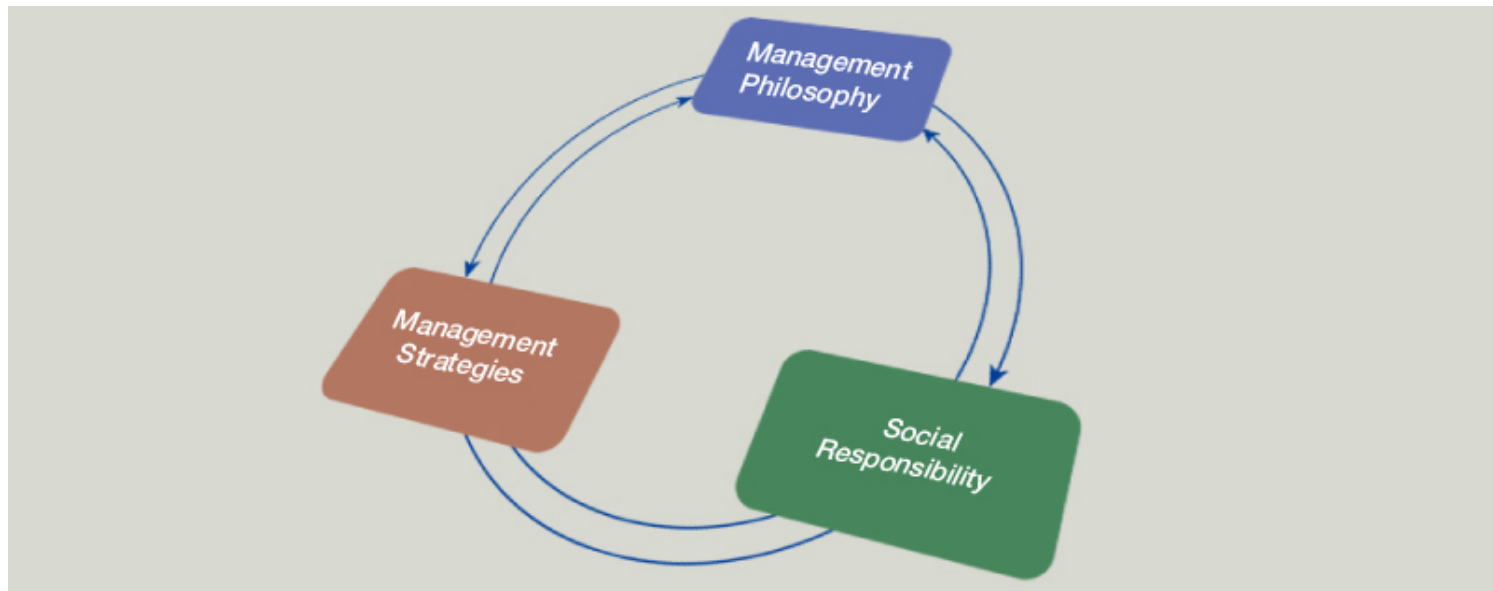
In November 2017, Toray announced with regret that Toray Hybrid Cord, Inc., a Toray subsidiary, had inappropriately overwritten product inspection report data. We sincerely apologize for the concern and inconvenience that this incident caused for our stakeholders. (For details on this incident and the Group's response, please see "[Reinforcing Compliance in Product Quality Assurance](#)" in this report.)

At the Toray Group, we expect all officers and employees to acquire right knowledge and constantly consider whether their subordinates, colleagues, supervisors—and most of all themselves—are behaving appropriately. Group-wide, we share the conviction that this practice raises not only personal and professional value, but also the value of the workplace, products and company; proper conduct is critical to our capacity to contribute to society. In our renewed effort to ensure compliance in quality assurance processes, we have asked our entire team to recommit themselves to having the integrity to do the right thing in the right way.

This report systematically presents our social responsibility initiatives and results for fiscal 2017 and is designed to engage all of our stakeholders. I invite you to spend some time with this report and get to know the Toray Group better.

September 2018

## Toray Group Corporate Social Responsibility



The Toray Group strategically practices social responsibility guided by its three-year CSR Road Map, aiming to achieve sustainable growth while helping to build a more sustainable world.

### Report from the Chief CSR Officer

#### Pursuing CSR Initiatives to Position the Toray Group as an Enterprise of High Value to All Stakeholders

The Toray Group has from the beginning pledged to have a positive impact on society through its business and has made corporate social responsibility one of its highest management priorities, as an integral part of management philosophy.

The Group has set targets based on its CSR Guidelines in its CSR Road Map designed to systematically drive group-wide initiatives in the areas of corporate ethics, legal compliance, environmental preservation, human rights, human resource development, and social contribution. Social issues have been diversifying in recent years. In response, the Toray Group aims to play an important role in securing sustainable growth and solving global challenges through its businesses, and it is committed to be an enterprise of high value to all stakeholders.

In November 2017, we disclosed the inappropriate overwriting of product quality data by a Toray subsidiary. In response to this incident, the Toray Group is redoubling its efforts to verify product safety and quality, which we see as one of the most critical of our social responsibilities. Every Toray Group executive and employee will act fairly and with a strong sense of ethics and responsibility to be worthy of the trust and meet the expectations of society.

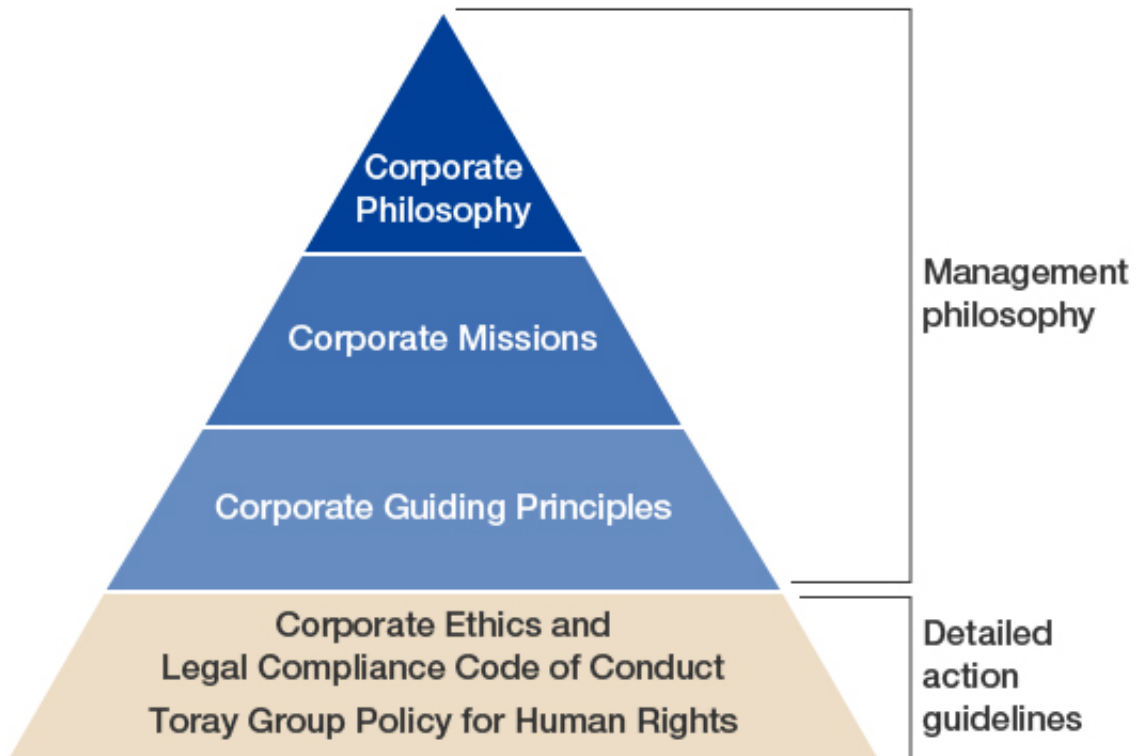


**Hideki Hirabayashi**  
Vice President, Chief CSR Officer, Toray Industries, Inc.

## Toray Group Corporate Social Responsibility Management Philosophy and CSR

Under a corporate philosophy of "contributing to society through the creation of new value with innovative ideas, technologies and products," the Toray Group has from the beginning pledged to have a positive impact on society through its business, realizing its corporate social responsibility and management philosophy at the same time.

### Management Philosophy and Code of Conduct



#### Related Information

- > [Corporate Philosophy](#)
- > [Corporate Missions](#)
- > [Corporate Guiding Principles](#)

## **Corporate Ethics and Legal Compliance Code of Conduct** (Adopted October 2003 and revised December 2015)

### **1. Contribute to society**

As a company aspiring to create new value, provide trustworthy products and services that satisfy our customers.

### **2. Communicate with society**

Communicate with the various parties associated with the company, including its customers and shareholders as well as members of the local community. Actively and fairly disclose pertinent information about the company.

### **3. Behave as a good corporate citizen**

Comply with laws and regulations, respect human rights, and actively contribute to society as a good corporate citizen.

### **4. Play an active role in preserving the global environment**

Recognize that playing an active role in preserving the global environment is an important management issue, and strive to coexist with the environment in all corporate activities by conserving energy, reducing emissions and waste, promoting recycling, and so forth.

### **5. Prioritize fairness and trust in corporate activities**

Engage in proper trade based on free, fair, and transparent market competition, and conduct corporate activities that earn the deep trust of society.

### **6. Comply with national laws and regulations**

Pursue management reform from a global perspective, comply with the respective national laws and regulations in overseas operations, and be self-disciplined with high ethical standards. Conduct corporate activities with respect to the culture and customs of each country and contribute to the advancement of local communities.

### **7. Raise motivation and create a corporate culture that lets employees demonstrate their ability**

Strive to create a corporate environment that allows each and every employee to be motivated to demonstrate their ability, respect individual human rights, character, and personality, and maximize creativity and professionalism.

### **8. Break off relations with antisocial forces**

Always work for the good of society, break off relations with antisocial forces that threaten the order and safety of civil society, and take a resolute stand as a unified company.

## **Toray Group Policy for Human Rights** (Adopted December 2017)

We at Toray Group believe that respect for human rights is a mandatory principle for corporate management. Therefore, we respect international standards such as the United Nations Universal Declaration of Human Rights and the International Labor Organization's standards in compliance with the laws and regulations of countries

and regions where we operate, and will endeavor to fulfill our duty of respect for human rights as a good corporate citizen.

1. We will respect human rights, character and individuality of employees and eliminate harassment and discrimination in workplaces. Furthermore, we will prohibit child labor, forced labor and unfair low-wage labor.
2. We will strive to promote respect for human rights throughout the entire supply chain related to our business activities. In addition, we will not be complicit in infringing on the human rights.
3. We will endeavor to understand adverse human rights impacts associated with our business activities and to avoid or reduce such influences.
4. If it becomes evident that we have caused or contributed to adverse human rights impacts, we will promptly take appropriate actions.
5. We will promote educational activities about issues of human rights for every employee and foster a proper understanding of issues among them.

## **Ten Basic Environmental Rules** (Adopted January 2000 and revised June 2011)

### **1. Prioritize environmental preservation**

We shall comply with all laws, regulations, and agreements in all of our business activities. Taking into consideration biodiversity, we shall place the highest priority on environmental preservation in the manufacture, handling, use, sale, transport, and waste disposal of products.

### **2. Prevent global warming**

We shall promote energy conservation and work to reduce our unit energy consumption and our carbon dioxide emissions.

### **3. Achieve zero emissions of environmental pollutants**

We shall strive continuously to reduce our emissions with the ultimate goal of achieving zero emissions of hazardous chemical substances and waste materials into the environment.

### **4. Use safer chemical substances**

We shall collect, maintain, and provide information on the health and environmental effects of the chemical substances we handle while striving to use safer chemical substances.

### **5. Promoting Recycling**

We shall develop recycling technologies for products, containers, and packaging and cooperate with society in promoting the recovery and reuse of such items.

### **6. Improve the level of environmental management**

We shall work to maintain and improve the level of our environmental management while working to upgrade our environmental management technology and skills, performing self auditing, and taking other measures.

### **7. Contribute to society through environmental improvement technologies and products**



We shall meet the challenge of developing new technologies and shall contribute to society through environmental improvement technologies as well as products that place a low burden on the environment.

**8. Improve the environmental management of our overseas businesses**

In our overseas business activities, we shall place top priority on complying with local laws and regulations, and further, we shall manage those businesses in accordance with the management standards of the Toray Group.

**9. Improve employees' environmental awareness**

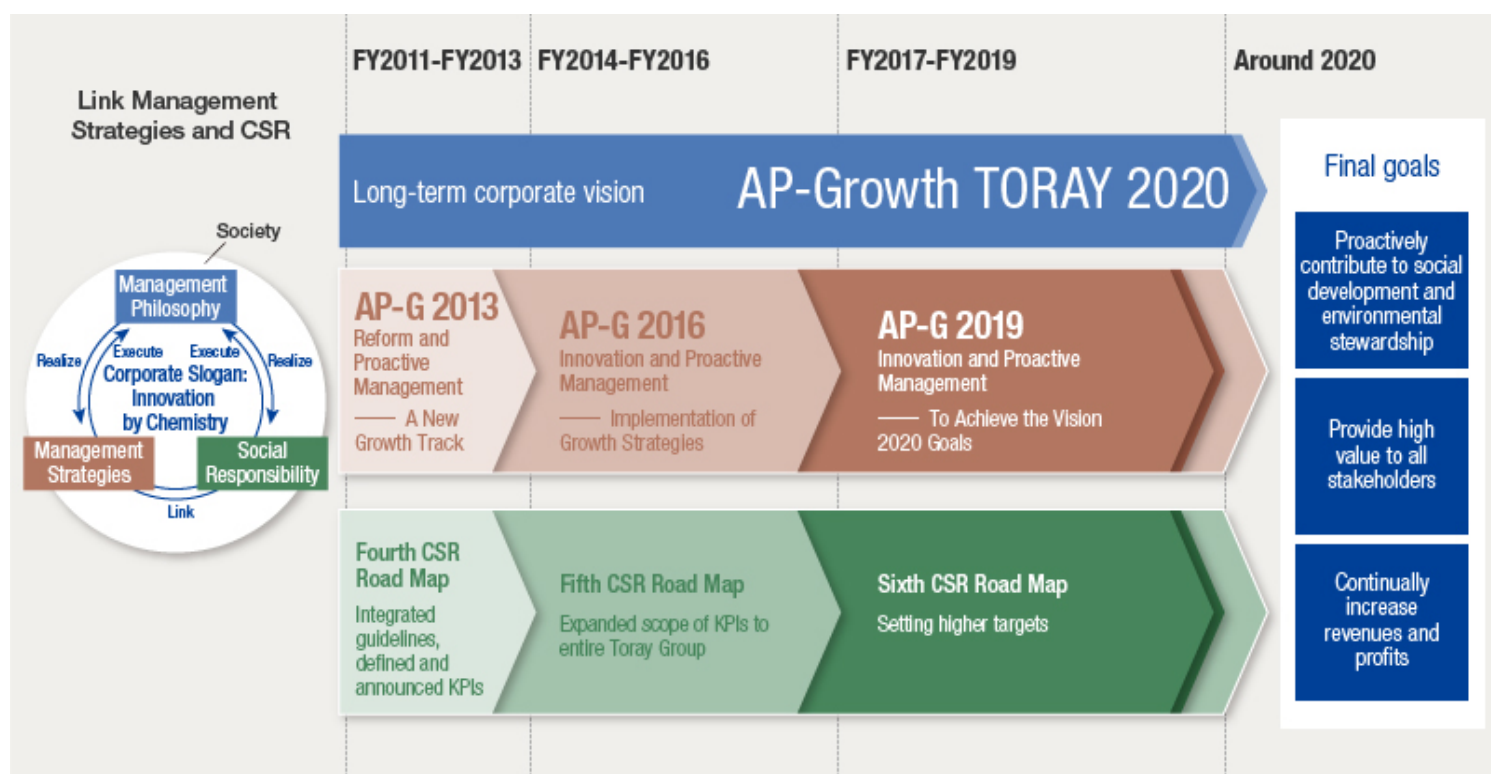
We shall strive to improve our employees' awareness of environmental issues through environmental education, social activities, internal communications activities, and other means.

**10. Share environmental information with society**

We shall deepen mutual understanding of Toray Group environmental policies and practices by widely publicizing our environmental preservation efforts and their results in environmental reports and other publications directed at local communities, investors, and the media.

## Toray Group Corporate Social Responsibility Management Strategies and CSR

In order to achieve sustainable growth, corporations must do business in a way that earns the broad trust of stakeholders. To live up to its philosophy, the Toray Group implements its management strategies hand-in-hand with its efforts to fulfill social responsibilities.



The Toray Group executes management strategies in order to remain a corporate group that continually expands its revenues and profits, guided by the long-term corporate vision, AP-Growth TORAY 2020, which was launched in April 2011. The Group began executing the medium-term management program, Project AP-G 2019, in April 2017, to pursue innovation and proactive management in order to deliver on the long-term corporate vision.

Project AP-G 2019 sets the three basic strategies along with five key initiatives to expand businesses, while stressing the importance of practicing social responsibility with a commitment to safety, accident prevention, environmental preservation, corporate ethics, and legal compliance. Meanwhile, the Group has set out the Sixth CSR Road Map, which covers the same time frame as Project AP-G 2019, based on its corporate philosophy to expand its efforts to realize value creation and ensure more robust environmental, social and governance (ESG) performance.

In July 2018, the Toray Group Sustainability Vision was established. It describes the world as envisioned by the Group and includes quantitative targets to achieve by fiscal 2030. The Group integrates its management strategies, the CSR Road Map, and the Sustainability Vision to drive the progress of its initiatives.

## Main Points of Project AP-G 2019

Three basic strategies	1. Business expansion in growth business fields	Specific measures 1. Make a strong, comprehensive push to create new demand and expand business as a group-wide project. 2. Capitalize on revenue opportunities in growth countries and regions. 3. Secure total cost reductions, strengthen the profit structure, and strengthen sales and marketing.
	2. Expansion and advancement of global business	
	3. Strengthening competitiveness	
Five key initiatives	1. New business creation	Specific measures 1. Develop sources of revenue for the next stage of growth. 2. Develop new technologies and materials. 3. Execute 500 billion yen in capital investments. 4. Amplify and supplement growth in existing businesses. 5. Develop future management candidates; secure and develop core human resources.
	2. R&D and intellectual property	
	3. Capital investment	
	4. M&A and business alliances	
	5. Human resources	

### Related Information

> [Long-Term Corporate Vision, Medium Term Management Program](#)

Toray Group Corporate Social Responsibility

# Organizational Structure for Social Responsibility

## Working Comprehensively on Social Responsibility, Management Philosophy and Management Strategy

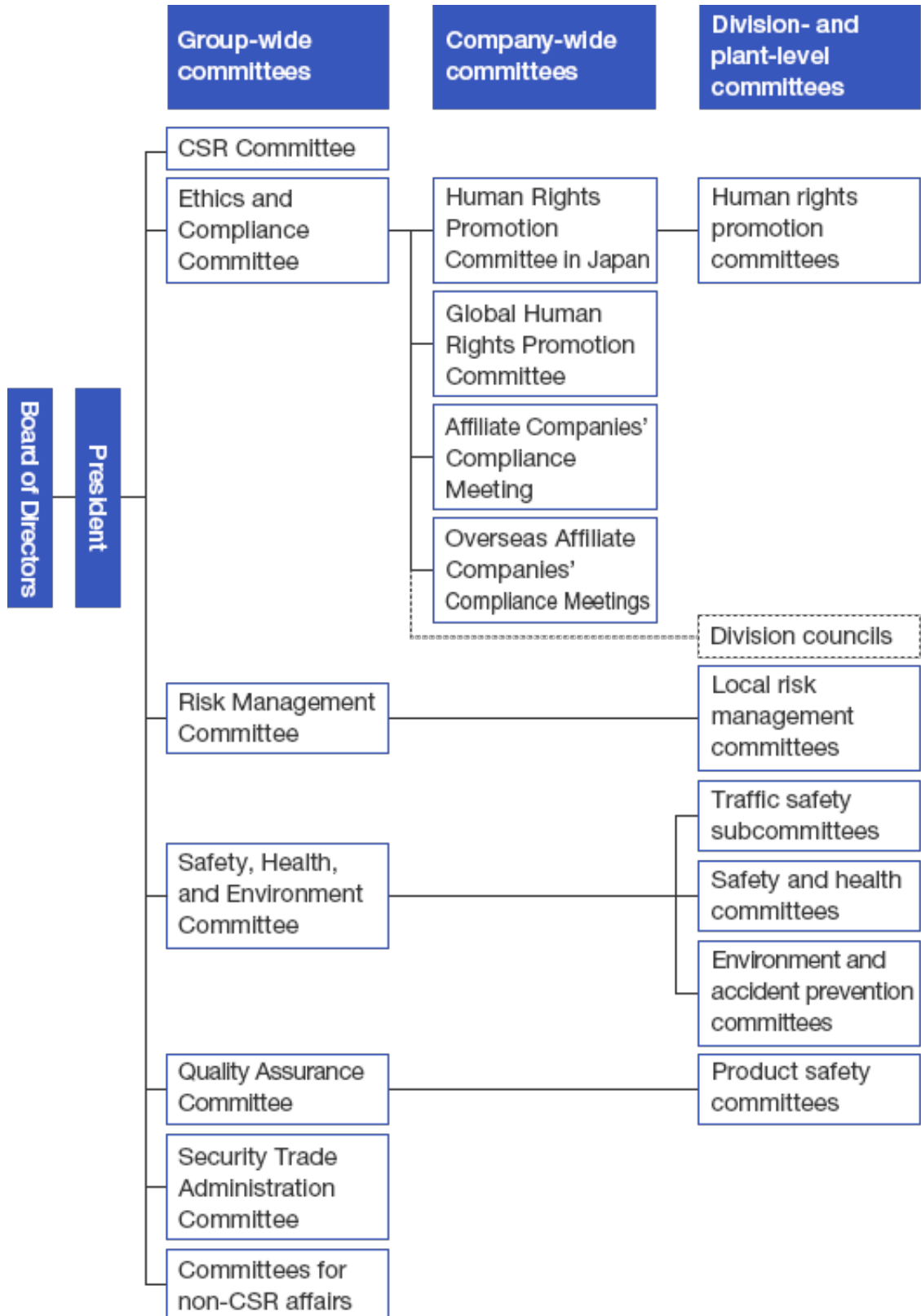
The Toray Group takes a comprehensive approach to practicing social responsibility and pursuing its management philosophy and management strategies, recognizing that fulfilling social responsibilities is integral to business growth.



## Organizational Structure for Social Responsibility

The Toray Group's CSR Committee serves as a group-wide deliberative organization for important issues concerning social responsibility. The committee is aligned with five other group-wide committees and works to accomplish tasks based on the themes in the CSR Guidelines.

Committee and Implementation Organization (As of August 1, 2018)



## Toray Group Corporate Social Responsibility CSR Guidelines

The Toray Group's CSR Guidelines are organized into 10 items. Each item is grouped under one of four themes: Value Creation (based on the corporate philosophy), Governance, Social Initiatives, or Environment. The Group systematically pursues initiatives guided by these CSR Guidelines, viewing these efforts as an integral part of its management philosophy.

Value Creation	<p><b>7. Contributing Solutions to Social Issues through Business Activities</b> Leverage innovation to address global-scale environmental issues such as climate change and provide solutions for various social issues such as the need to improve the quality of medical care, the need to reduce the burden on medical staff, and health maintenance and longevity, thereby helping to build a more sustainable world.</p>
Governance	<p><b>1. Corporate Governance and Management Transparency</b> Continually revise management systems, strengthen internal controls and strive for timely and appropriate information disclosure as part of efforts to fulfill the company's social responsibilities</p>
	<p><b>2. Corporate Ethics and Legal Compliance</b> Ensure all executives and employees uphold a sense of responsibility, fairness and high ethical standards, and always act in accordance with the law to maintain the trust of society</p>
	<p><b>5. Risk Management</b> Enhance group-wide risk management systems including those pertaining to information security. Build systems capable of rapidly responding to unexpected circumstances and disclosing accurate information</p>
Social Initiatives	<p><b>8. Human Rights Promotion and Human Resources Development</b> Respect human rights, provide safe and healthy workplaces for employees, secure and train personnel, and diversify while striving to protect employment</p>
	<p><b>4. Product Safety and Quality</b> Provide safe, highly reliable products by striving to enhance management systems for product safety and quality assurance, and disclose appropriate information</p>
	<p><b>9. Facilitating CSR Initiatives Throughout the Supply Chain</b> Promote CSR initiatives in areas including environmental preservation and human rights throughout the entire supply chain by working closely with suppliers, processing vendors, customers and distribution companies</p>

### 6. Communication

Disclose corporate information in an active, fair and straightforward manner, and encourage dialogue and cooperation with stakeholders including employees, stockholders, investors, business partners, consumers, local communities, non-profit organizations, government and administrative agencies, mass media, analysts, and other parties

### 10. Social Contribution Activities

Proactively participate in local communities and the larger society in order to contribute to development in a way befitting a good corporate citizen

### Environment

### 3. Safety, Accident Prevention, and Environmental Preservation

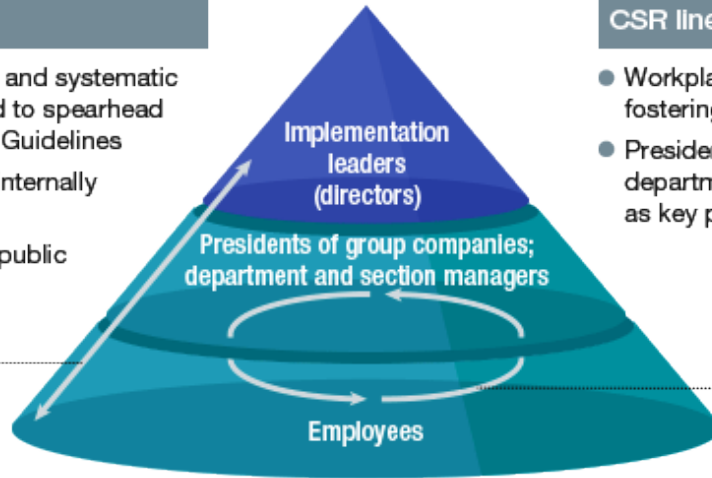
Ensure the safety and health of society and employees, and protect the environment in all business processes, from procuring raw materials and manufacturing to the supply and disposal of products

## "CSR Guideline Activities" and "CSR Line Activities"

The Toray Group implements "CSR Guideline activities" (group-wide CSR activities) and "CSR line activities" (workplace-driven CSR activities) in parallel. The former are driven by the entire organization based on the CSR Guidelines, while the latter are pursued by individual divisions in accordance with their own targets.

#### CSR Guideline activities

- Implemented on organizational and systematic basis, with a director appointed to spearhead each item in Toray Group CSR Guidelines
- Related activities are reported internally through the CSR Committee
- Information is disclosed to the public via CSR reports, websites, and other media



#### CSR line activities

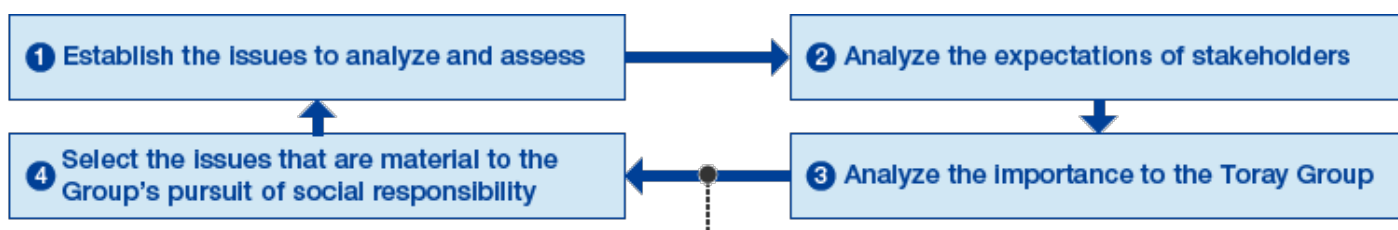
- Workplaces strive to solve problems while fostering a CSR mindset
- Presidents of group companies and department/section heads are appointed as key personnel

## Toray Group Corporate Social Responsibility Materiality

In fiscal 2015, the Toray Group conducted a materiality assessment to identify the issues that are most important to its pursuit of social responsibility (material issues for CSR). In fiscal 2016, the Group reevaluated the material issues when drafting its Sixth CSR Road Map, which started in fiscal 2017. This process incorporated input from thought leaders and resulted in revisions to the issues.

### Materiality Assessment Cycle

The Toray Group regularly implements the following process to reevaluate its material issues for CSR.



### Dialogue with Thought Leaders during the Reevaluation of Material Issues

In November 2016, the Group held a dialogue meeting with several thought leaders to share their valuable input on its material issues for CSR, seeking to benefit from their specialized knowledge. The Group incorporated the valuable advice received during the meeting into its reevaluation of material issues.





## Main Input from CSR Thought Leaders

Outside of Japan, the consideration of environmental, social and governance (ESG) factors by investors is gaining more and more mainstream traction. The Toray Group is responding to the trend toward ESG investment by pursuing forward-thinking, well-rounded CSR initiatives. However, it can be difficult at times to grasp the focus of these initiatives. For example, it would be advisable for the Group to disclose the global-scale issues that it believes are most material, and why it sees them that way. Furthermore, scrutiny will shift from the products the Group makes, to the raw materials the Group is using to make them. Addressing concerns like these can also create new business opportunities for the Group. The Group would do well to thoroughly discuss its choice of material issues and CSR Road Map, as well as to examine the Sustainable Development Goals (SDGs). I believe this will help the Group to expand its vision of the issues that the global community considers most pressing.

I have three suggestions. First, human resources and labor initiatives should be disclosed on a group-wide basis, rather than only for Toray Industries, Inc. Second, exercising responsibility for the supply chain is becoming more critical, so the Group needs to fully communicate its risks in the supply chain, including where in the supply chain those risks appear. Third, the Group needs to have a true long-term vision—longer than the next three or four years. Identifying material issues is a process that will help the Group to implement and strengthen its CSR initiatives. The Group should link the material issues to the implementation of specific initiatives.

The United Nations Sustainable Development Goals (SDGs) set specific targets for the international community to achieve by 2030. I hope that the Toray Group will present its own long-term vision and use backcasting to identify the steps it will take to achieve it. It is becoming increasingly important to engage stakeholders in dialogue. The Group must establish mechanisms for gaining input from stakeholders in the supply chain and identifying their expectations, even if the Group does not directly do business with or directly employ those stakeholders. I strongly suggest that the Group perform human rights due diligence and create grievance mechanisms that are accessible to the public.



Takejiro Sueyoshi  
Special Adviser,  
UNEP Finance  
Initiative



Professor  
Yoshinao Kozuma  
Faculty of Economics,  
Sophia University



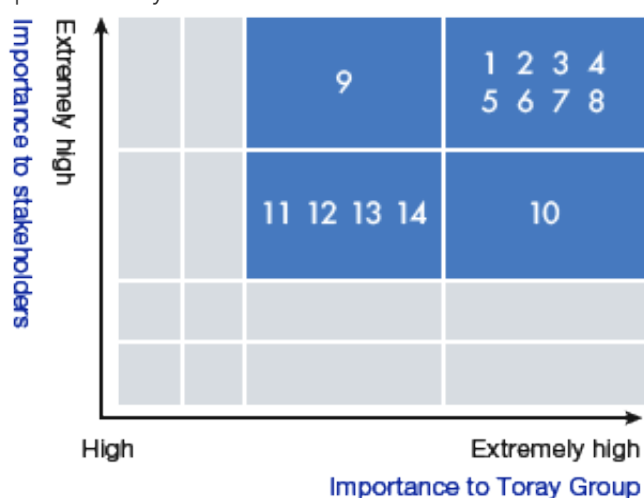
Kaori Kuroda  
Executive Director,  
CSO Network Japan

## Updated Material Issues and Key Performance Indicators Reflected in the CSR Road Map

Based on the dialogue with thought leaders, the Group engaged in internal discussions on the material issues. The issues were then revised following discussions at the 31st meeting of the CSR Committee, which took place on June 13, 2017. First, the Group revised the CSR Road Map to reflect the updated material issues. This will enable the Group to implement specific initiatives that clearly address the material issues identified, and report on them based on the *G4 Sustainability Reporting Guidelines* from GRI. Secondly, the Group defined how the material issues are connected to the CSR Guidelines and the goals of the CSR Road Map, and established new key performance indicators (KPIs) for the revised material issues, in order to guide the implementation of initiatives.

While the Group's CSR initiatives reflect local circumstances in countries and regions, it also has shared, group-wide initiatives that are advanced under group-wide targets. The Sixth CSR Road Map includes group-wide KPIs, and calls for CSR initiatives to be implemented using the Plan-Do-Check-Act (PDCA) cycle.

Toray Group Materiality Matrix



1. Contributing to the solution of environmental issues through business activities
2. Contributing to health maintenance and longevity through business activities
3. Addressing resource and energy issues
4. Reducing greenhouse gas emissions
5. Addressing substances with negative environmental impact
6. Corporate ethics and legal compliance
7. Ensuring safety and disaster preparedness
8. Ensuring product safety and quality
9. Initiatives for managing water resources
10. Managing social and environmental impact of suppliers
11. Respecting human rights
12. Creating a positive workplace
13. Securing and developing human resources
14. Conserving biodiversity

# CSR Road Map and Progress on Key Performance Indicators in Fiscal 2017

The Toray Group assembles a CSR Road Map based on its CSR Guidelines every three years. This serves as the Group's medium-term plan for executing CSR initiatives. The CSR Road Map designates implementation leaders for each item of the CSR Guidelines, and sets out specific action goals as well as key performance indicators (KPIs). The progress on achieving the KPIs is quantitatively managed each fiscal year.

## Sixth CSR Road Map

The Sixth CSR Road Map is being implemented from fiscal 2017 through fiscal 2019, the same period as the medium-term management program, Project AP-G 2019. The Sixth CSR Road Map sets out new CSR strategies and serves as the Group's guide for addressing the material issues that have been identified as critical to stakeholders and the Group, outlining concrete initiatives to address the material issues. Moving forward, the Group will focus its efforts on initiatives that address the material issues.

The road map includes group-wide KPIs in most areas, mandating group-wide efforts to meet CSR objectives. The Group will continue to disclose its progress in executing the Sixth CSR Road Map every year in its CSR report.

Sixth CSR Road Map (Fiscal 2017–2019)

(PDF:456KB) [PDF](#)

	CSR Guidelines	CSR Road Map goals	Key performance indicators
Value Creation	<p><b>7 Contributing Solutions to Social Issues through Business Activities</b></p> <p>Leverage innovation to address global-scale environmental issues such as climate change and provide solutions for various social issues such as the need to improve the quality of medical care, the need to reduce the burden on medical staff, and health maintenance and longevity, thereby helping to build a more sustainable world.</p>	<p>1 Help address social issues by developing innovative materials and new technologies, focusing on the fields of Green Innovation and Life Innovation</p> <p>[Related material issues for CSR]</p> <ul style="list-style-type: none"> <li>Contributing to the solution of environmental issues through business activities</li> <li>Contributing to health maintenance and longevity through business activities</li> <li>Initiatives for managing water resources</li> </ul>	<p>1 Sales of Green Innovation products (billion yen)</p> <p>2 Sales of Life Innovation products (billion yen)</p> <p>3 Contribution of Toray water treatment products (converted to treated water amount) (tons/day)</p>
Governance	<p><b>1 Corporate Governance and Management Transparency</b></p> <p>Continually revise management systems, strengthen internal controls and strive for timely and appropriate information disclosure as part of efforts to fulfill the company's social responsibilities</p>	<p>1 Enhance management transparency, continually reflect stakeholder feedback in management, and fulfill responsibilities to explain corporate activities</p>	<p>1 Number of dialogue meetings with stakeholders</p>
		<p>2 Perform monitoring based on the Basic Policy for Internal Control Systems, in accordance with Japan's Companies Act</p>	<p>2 Board of Directors' positive assessment of the implementation of the Basic Policy for Internal Control Systems (%)</p>
		<p>3 Expand CSR education throughout the Toray Group to facilitate CSR activities</p>	<p>3 Group companies implementing CSR education (%)</p>
	<p><b>2 Corporate Ethics and Legal Compliance</b></p> <p>Ensure all executives and employees uphold a sense of responsibility, fairness and high ethical standards, and always act in accordance with the law to maintain the trust of society.</p>	<p>1 No major cases throughout the Toray Group of non-compliance with or violation of bribery regulations, antitrust laws, etc.</p> <p>[Related material issue for CSR]</p> <ul style="list-style-type: none"> <li>Corporate ethics and legal compliance</li> </ul>	<p>1 Number of major violations of laws or ordinances</p>
		<p>2 Promote compliance activities in accordance with the conditions of each country or region</p>	<p>2 Implementing internal legal audits of group companies, group companies improving problems found in internal legal audits in the previous year (%)</p>
		<p>3 Enhance awareness-raising and educational activities relating to corporate ethics and legal compliance</p>	<p>3 Group companies providing information and implementing education on major laws and regulations (%)</p>
<p><b>5 Risk Management</b></p> <p>Under normal conditions, the Toray Group focuses on mitigating risk and preventing crises from occurring. In the event of a crisis, the Group strives to prevent damage from increasing, by bringing the situation quickly under control and normalizing conditions with a prompt and appropriate response.</p>	<p>1 Strengthen corporate risk management throughout the Toray Group and mitigate risks</p>	<p>1 Group companies implementing continuous review of risk management (%)</p>	
	<p>2 Instill greater risk management among employees by rolling out risk management education throughout the Toray Group</p>	<p>2 Group companies implementing risk management education (%)</p>	
Social Initiatives	<p><b>8 Human Rights Promotion and Human Resources Development</b></p> <p>Respect human rights, provide safe and healthy workplaces for employees, secure and train personnel, and diversify while striving to protect employment.</p>	<p>1 Respect for human rights and fair promotion based on ability throughout the Toray Group by eliminating discrimination based on race, gender, education, nationality, religion, and physical attributes</p> <p>[Related material issue for CSR]</p> <ul style="list-style-type: none"> <li>Respecting for human rights</li> </ul>	<p>1 Group companies in Japan implementing human rights education and training (%)</p> <p>2 Group companies that have achieved legally mandated employment rate of persons with disabilities (%)</p> <p>3 Women in management positions (%)</p>
		<p>2 Ensure work environments take into consideration employees' health and build a vibrant and rewarding workplace culture group-wide, working systematically to secure and train personnel</p> <p>[Related material issues for CSR]</p> <ul style="list-style-type: none"> <li>Creating a positive workplace</li> <li>Securing and developing human resources</li> </ul>	<p>4 Group companies that have adopted a medium-term human resource plan (%)</p> <p>5 Number of core staff outside Japan who participate in training courses</p> <p>6 Training expenditures per employee (yen)</p> <p>7 Available annual paid leave used by employees (%)</p>

Reporting scope <sup>1</sup>	Targets <sup>2</sup>			Results		Implementation leader <sup>4</sup>
	Fiscal 2017	Fiscal 2018	Fiscal 2019	Fiscal 2017	Degree of success <sup>3</sup>	
1 Toray Group	1 900 billion yen (fiscal 2019 target)			1 712.3 billion yen	1 N.A.	<b>Koichi Abe</b> Executive Vice President, General Manager of Intellectual Property Division, Automotive Material Strategic Planning Department, Global Environment Business Strategic Planning Department, Life Innovation Business Strategic Planning Department, Technology Center, Toray Human Resources Development Center, Toray Industries, Inc.
2 Toray Group	2 270 billion yen (fiscal 2019 target)			2 211.9 billion yen	2 N.A.	
3 Toray Group	3 59 million tons/day (fiscal 2019 target)			3 41.34 million tons/day	3 N.A.	
1 Toray Group	1 8 times	1 8 times	1 8 times	1 8 times	1 ○	<b>Yukichi Deguchi</b> Executive Vice President, General Manager of Corporate Strategic Planning Division, Quality Assurance Division, Legal & Compliance Division (Security Trade Administration Department), HS Business Development Department, Toray Industries, Inc.
2 Toray Group	2 90%	2 90%	2 90%	2 94.6%	2 ○	
3 Toray Group	3 100%	3 100%	3 100%	3 100%	3 ○	
1 Toray Group	1 0	1 0	1 0	1 1	1 ×	<b>Yoshio Yamamoto</b> Director, General Manager of Legal & Compliance Division, Compliance Department, Toray Industries, Inc.
2 Toray Group	2 Audits: In fiscal 2018 at Toray and its group companies in Japan; in fiscal 2017 and 2019 at group companies outside Japan Percent that improved: 100% for all audits by the following fiscal year			2 100%	2 ○	
3 Toray Group	3 100%	3 100%	3 100%	3 100%	3 ○	
1 Toray Group	3 100%	3 100%	3 100%	3 100%	1 ○	<b>Yukichi Deguchi</b> Executive Vice President, General Manager of Corporate Strategic Planning Division, Quality Assurance Division, Legal & Compliance Division (Security Trade Administration Department), HS Business Development Department, Toray Industries, Inc.
2 Toray Group	2 60%	2 80%	3 100%	3 100%	2 ○	
1 Toray Group	1 100%	1 100%	1 100%	1 100%	1 ○	<b>Shigeki Taniguchi</b> Vice President, General Manager of Personnel & Industrial Relations Division, Toray Industries, Inc.
2 Toray Group (Japan)	2 100%	2 100%	2 100%	2 60%	2 △	
3 Toray	3 N.A.	3 N.A.	3 N.A.	3 4.6%	3 N.A.	
4 Toray Group	4 100%	4 100%	4 100%	4 100%	4 ○	
5 Toray Group (Outside Japan)	5 N.A.	5 N.A.	5 N.A.	5 214	5 N.A.	
6 Toray	6 N.A.	6 N.A.	6 N.A.	6 99,069 yen	6 N.A.	
7 Toray	7 N.A.	7 N.A.	7 N.A.	7 88.4%	7 N.A.	

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2 For key performance indicators with no numerical targets, the results will not be categorized by degree of success but will be disclosed and monitored.

3 The degree of success is defined as follows: ○ means the target was fully met; △ means the target was 50% met or better; and × means the target was less than 50% met. "N.A." means no targets were specified for the fiscal year under review.

4 Names and job titles of implementation leaders are current as of August 1 2018.

	CSR Guidelines	CSR Road Map goals	Key performance indicators
Social Initiatives	<p><b>4 Product Safety and Quality</b></p> <p>Provide safe, highly reliable products by striving to enhance management systems for product safety and quality assurance, and disclose appropriate information.</p>	<p><b>1</b> Achieve zero product accidents</p> <p>[Related material issue for CSR]</p> <ul style="list-style-type: none"> <li>• Ensuring product safety and quality</li> </ul>	<p><b>1</b> Number of product accidents</p>
		<p><b>2</b> Enhance the group-wide framework for product safety and quality assurance</p>	<p><b>2</b> Group companies implementing product safety and quality assurance education (%)</p>
	<p><b>9 Facilitating CSR Initiatives Throughout the Supply Chain</b></p> <p>Promote CSR initiatives in areas including environmental preservation and human rights throughout the entire supply chain by working closely with suppliers, processing vendors, customers and distribution companies.</p>	<p><b>1</b> To ensure socially responsible procurement by the Toray Group, request major suppliers and business partners to practice CSR and work with suppliers to promote greater awareness of human rights, social, and environmental issues</p> <p>[Related material issue for CSR]</p> <ul style="list-style-type: none"> <li>• Managing social and environmental impact of suppliers</li> </ul>	<p><b>1</b> Number of group companies that have requested their suppliers to practice CSR</p> <p><b>2</b> Number of business partners that Toray Group companies have requested to practice CSR (cumulative)</p> <p><b>3</b> Reduction in CO<sub>2</sub> emissions per unit of sales from distribution activities (year-on-year)</p> <p><b>4</b> Modal shift to sea or rail for transport across distances for 500 km or more (%)</p>
	<p><b>6 Communication</b></p> <p>Disclose corporate information in an active, fair and straightforward manner, and encourage dialogue and cooperation with stakeholders including employees, stockholders, investors, business partners, consumers, local communities, non-profit organizations, government and administrative agencies, mass media, analysts, and other parties.</p>	<p><b>1</b> Promote dialogue and collaboration with stakeholders in accordance with the Basic Policies to Promote Dialogue with Stakeholders</p> <p><b>2</b> Reflect results of dialogue and collaboration with each stakeholder group in management activities in a timely and appropriate manner</p>	<p><b>1</b> Number of corporate website page views (per month)</p> <p><b>2</b> Group companies that have their own websites (%)</p> <p><b>3</b> Number of news releases</p> <p><b>4</b> Number of responses to investor inquiries</p> <p><b>5</b> Number of meetings with employees or labor unions</p>
	<p><b>10 Social Contribution Activities</b></p> <p>Proactively participate in local communities and the larger society in order to contribute to development in a way befitting a good corporate citizen.</p>	<p><b>1</b> Pursue ongoing social initiatives throughout the Toray Group in the priority areas of “science and technology promotion,” “environment and communities,” and “health and welfare.”</p>	<p><b>1</b> Social contribution expenditure (% compared with fiscal 2011–2016 average)</p> <p><b>2</b> Number of persons reached through educational initiatives in these key fields</p>
Environment	<p><b>3 Safety, Accident Prevention, and Environmental Preservation</b></p> <p>Ensure the safety and health of society and employees, and protect the environment in all business processes, from procuring raw materials and manufacturing to the supply and disposal of products</p>	<p><b>1</b> Clarify and fully comply with essential safety guidelines, and encourage employees to think carefully before taking action to prevent accidents</p> <p>[Related material issue for CSR]</p> <ul style="list-style-type: none"> <li>• Ensuring safety and disaster preparedness</li> </ul>	<p><b>1</b> Number of major accidents</p> <p><b>2</b> Achieve world’s best standard for safety management (not exceeding 0.05 frequency rate for occupational accidents resulting in lost work time)</p> <p><b>3</b> Number of fire and explosion accidents</p> <p><b>4</b> Number of environmental accidents</p>
		<p><b>2</b> Reduce environmental impact by working to fulfill the Fifth Medium-Term Environmental Plan (achieve targets by fiscal 2020)</p> <p>[Related material issues for CSR]</p> <ul style="list-style-type: none"> <li>• Addressing substances with negative environmental impact</li> <li>• Addressing resource and energy issues</li> <li>• Reducing greenhouse gas emissions</li> </ul>	<p><b>5</b> Reduction of atmospheric VOC emissions (%)</p> <p><b>6</b> Waste recycling rate (%)</p> <p><b>7</b> Reduction of greenhouse gas emissions per unit of sales (%)</p>
		<p><b>3</b> Pursue environmental preservation on the basis of policies on water resources and biodiversity</p> <p>[Related material issues for CSR]</p> <ul style="list-style-type: none"> <li>• Initiatives for managing water resources</li> <li>• Conserving biodiversity</li> </ul>	<p><b>8</b> Water usage per unit of sales (%)</p> <p><b>9</b> Number of companies and plants developing greenery policy and plan</p>

Reporting scope <sup>1</sup>	Targets <sup>2</sup>			Results		Implementation leader <sup>4</sup>
	Fiscal 2017	Fiscal 2018	Fiscal 2019	Fiscal 2017	Degree of success <sup>3</sup>	
1 Toray Group	1 0	1 0	1 0	1 0	1 ○	<b>Yukichi Deguchi</b> Executive Vice President, General Manager of Corporate Strategic Planning Division, Quality Assurance Division, Legal & Compliance Division (Security Trade Administration Department), HS Business Development Department, Toray Industries, Inc.
2 Toray Group	2 100%	2 100%	2 100%	2 100%	2 ○	
1 Toray Group	1 40 or more (fiscal 2019 target)			1 127	1 ○	<b>Osamu Tsuneki</b> General Manager, Purchasing & Logistics Division, Toray Industries, Inc.
2 Toray Group	2 N.A.	2 N.A.	2 N.A.	2 3,170	2 N.A.	
3 Toray Group (Only specified consigners in Japan)	3 1%	3 1%	3 1%	3 1%	3 ○	
4 Toray	4 40% (fiscal 2019 target)			3 28%	4 △	
1 Toray Group	1 1.5 million page views	1 1.5 million page views	1 1.5 million page views	1 1.55 million page views	1 ○	<b>Hideki Hirabayashi</b> Vice President, Chief CSR Officer, Chief Legal & Compliance Officer, Director, General Administration & Communications Division; and General Manager, Tokyo Head Office, Toray Industries, Inc.
2 Toray Group	2 Japan: 70%, outside Japan: 100%	2 Japan: 80%, outside Japan: 100%	2 Japan: 90%, outside Japan: 100%	2 Japan: 80%, outside Japan: 100%	2 ○	
3 Toray Group	3 200	3 200	3 200	3 187	3 △	
4 Toray Group	4 N.A.	4 N.A.	4 N.A.	4 676	4 N.A.	
5 Toray Group	5 N.A.	5 N.A.	5 N.A.	5 14	5 N.A.	
1 Toray Group	1 At least as much as fiscal 2011-2016 average	1 At least as much as fiscal 2011-2016 average	1 At least as much as fiscal 2011-2016 average	1 126%	1 ○	<b>Hideki Hirabayashi</b> Vice President, Chief CSR Officer, Chief Legal & Compliance Officer, Director, General Administration & Communications Division; and General Manager, Tokyo Head Office, Toray Industries, Inc.
2 Toray Group	2 15,000 or more	2 15,000 or more	2 15,000 or more	2 16,709	2 ○	
1 Toray Group	1 0	1 0	1 0	1 1	1 ×	<b>Kazuyuki Adachi</b> Senior Vice President, General Manager of Manufacturing Division, Textile Technology & Production Division, Toray Industries, Inc.
2 Toray Group	2 No more than 0.05	2 No more than 0.05	2 No more than 0.05	2 0.39	2 ×	
3 Toray Group	3 0	3 0	3 0	3 3	3 ×	
4 Toray Group	4 0	4 0	4 0	4 2	4 ×	
5 Toray Group	5 At least 70% lower than fiscal 2000	5 At least 70% lower than fiscal 2000	5 At least 70% lower than fiscal 2000	5 72%	5 ○	
6 Toray Group	6 At least 86%	6 At least 86%	6 At least 86%	6 85.8%	6 △	
7 Toray Group (Japan)	7 At least 15% lower than fiscal 1990	7 At least 15% lower than fiscal 1990	7 At least 15% lower than fiscal 1990	7 24%	7 ○	
8 Toray Group	8 No more than 61% of 2001 level	8 No more than 61% of 2001 level	8 No more than 61% of 2001 level	8 54%	8 ○	
9 Toray Group	9 At least 45	9 At least 50	9 At least 55	9 49	9 ○	

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## Toray Group Sustainability Vision

**Providing Innovative Technologies  
and Advanced Materials  
to Help Address Global Issues**



At the Toray Group, we consider sustainability to be the most important global issue of the 21st century.

Today, climate change, water scarcity, and resource depletion are just some of the mounting environmental challenges facing the planet. With the global population expected to increase to some ten billion people by 2050 and aging demographics on the increase worldwide, an interlinked web of global issues are posing ever-graver problems.

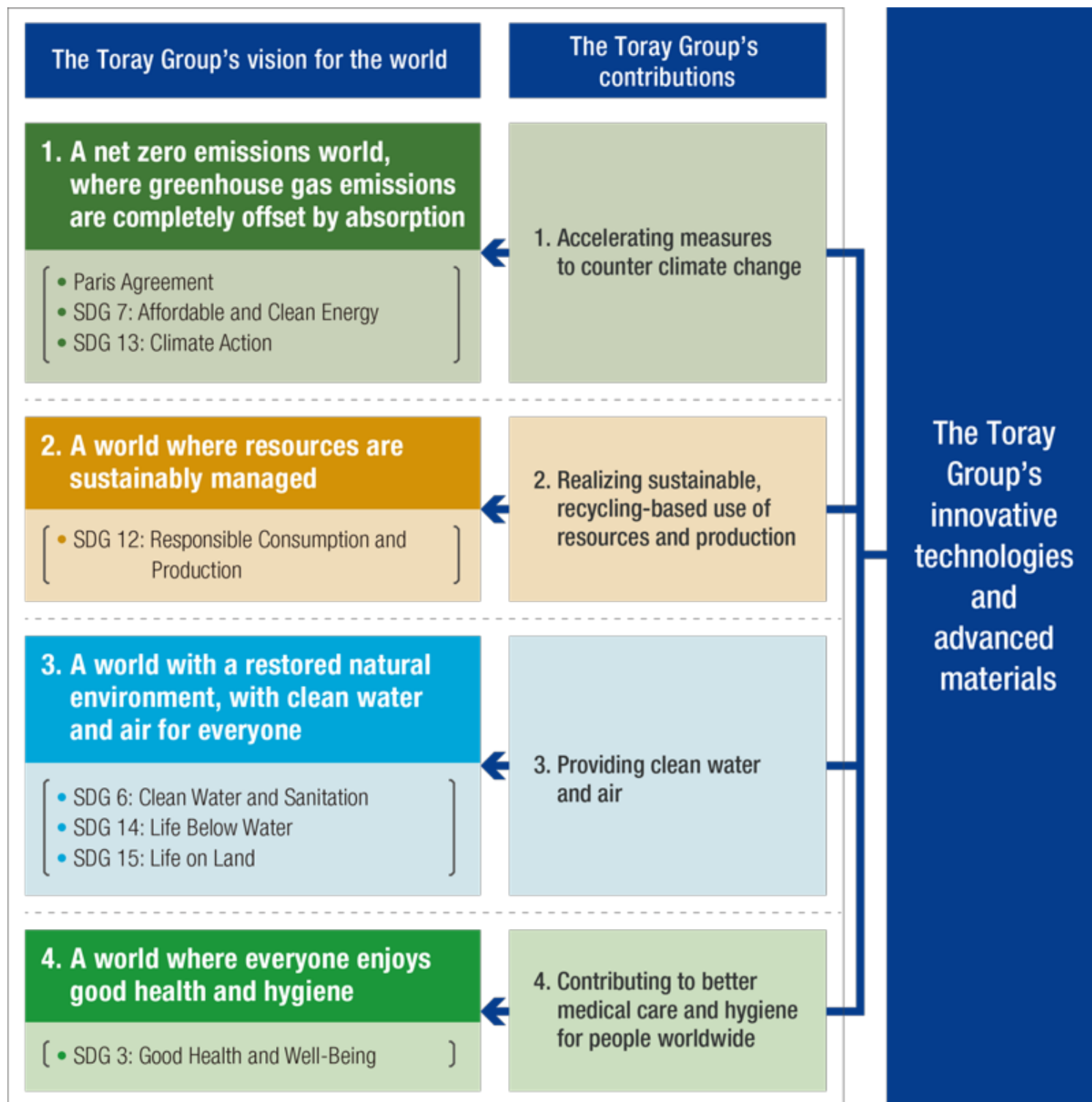
Since Toray's founding in 1926, we have always believed that materials can change lives, true to our fundamental corporate principle of contributing to society. At the Toray Group, we make it our mission to deliver innovative technologies and advanced materials that provide real solutions to the challenges the world faces with balancing development and sustainability.

We are convinced that Toray can continue to grow without negatively impacting global sustainability. By delivering on our corporate philosophy of “contributing to society through the creation of new value with innovative ideas, technologies and products,” we will do our utmost to address global issues, including the goals of the Paris Agreement and the United Nations Sustainable Development Goals (SDGs), while working closely with our business partners worldwide.



## The World as Envisioned by the Toray Group in 2050

At the Toray Group, we are focusing our efforts on the four priorities shown below, as we supply innovative technologies and advanced materials to help achieve our future vision for the world.



## Toray Group Initiatives

The Toray Group is hard at work on specific initiatives in the following four areas.

## 1. Accelerating measures to counter climate change



### Curbing CO<sub>2</sub> emissions throughout the life cycle of products

Toray provides lightweight and strong carbon fiber that can reduce the weight of aircraft and automobiles, to improve fuel economy and reduce CO<sub>2</sub> emissions.



### Building a renewable energy economy

Toray supplies materials for use in renewable energy technologies including wind and solar energy, and in hydrogen conversion, storage, and fuel cells.



### Reducing CO<sub>2</sub> emissions in manufacturing

Toray actively strives to reduce CO<sub>2</sub> emissions in manufacturing, through process improvements that conserve energy, use renewable energy and reduce the use of coal.

## 2. Realizing sustainable, recycling-based use of resources and production



### Using non-fossil resources (bioresources)

Toray works to reduce the world's dependency on fossil fuel resources by manufacturing non-edible plant-based fibers and developing materials and fuels using biotechnologies and membrane separation technology.



### Promoting product recycling

Toray facilitates recycling of its diverse products including fibers, resins, films, and carbon fiber.



### Reducing waste at production sites

Toray implements measures to use resources more effectively, practices recycling, and works to reduce waste.

### 3. Providing clean water and air



#### Providing safe water using membrane technologies

Toray supplies water treatment technologies for the desalination, purification, and reuse of water to address water scarcity and reduce environmental impacts.



#### Providing ultrafine filter fibers for cleaner air

Toray supplies proprietary ultrafine fiber non-woven fabrics that remove particulates from the air, delivering cleaner air around the world.



#### Managing water usage at plants and preventing air and water pollution

Toray pursues greater reuse of water, purification of exhaust ventilation and wastewater, and appropriate management of chemical substances at its plants. In areas where water resources are particularly scarce, Toray takes additional steps to curb water intake.



#### Inspiring interest in the environment

Toray supports education to raise awareness of environmental issues such as water scarcity.

## 4. Contributing to better medical care and hygiene for people worldwide



### Contributing to better public health by preventing infection, and more

Toray supplies advanced material products such as protective clothing to help secure human health.



### Improving the quality of medical care with innovative technologies and advanced materials

Toray supplies DNA microarrays for early diagnosis of diseases and innovative drugs that support people's health.



### Contributing to longevity

Toray manufactures advanced clothing that can monitor biological information and aging assistive products that support longevity and enhance the quality of life.

## Quantitative Targets for Fiscal 2030

The Toray Group is striving to achieve the following quantitative targets.<sup>1</sup>

- Supply four times more Green Innovation products (products that help to solve issues related to the global environment, resources, and energy) (This will avoid eight times more CO<sub>2</sub> emissions in the value chain<sup>2</sup>)
- Supply six times more Life Innovation products (products that enhance public health, improve the quality of medical care, and contribute to health maintenance and longevity)
- Triple the total annual volume of water treated using Toray's water treatment membranes<sup>3</sup>
- Reduce greenhouse gas emissions in production activities by 30% per unit of sales across the entire Toray Group by introducing renewable energy or taking other initiatives<sup>4</sup>
- Reduce water usage in production activities by 30% per unit of sales across the entire Toray Group

1. The baseline year for quantitative targets is fiscal 2013.
2. For CO<sub>2</sub> emissions avoided in the value chain, Toray calculates the CO<sub>2</sub> emissions reduced throughout the value chain of products in accordance with the chemical sector guidelines of the Japan Chemical Industry Association, the International Council of Chemical Associations (ICCA), and the World Business Council For Sustainable Development (WBCSD).
3. Toray calculates water treated with Toray's water treatment membranes by multiplying the amount of fresh water that its ultrafiltration water treatment membranes can produce per day, including reverse osmosis (RO), ultrafiltration (UF) and membrane separation bioreactors (MBR), by the number of membrane elements sold.
4. In Japan, Toray works to surpass the reduction target set for the industrial sector by the Japanese government (absolute emissions reduced by 7%), which is based on the Paris Agreement. With the use of renewable energies and other zero emission power sources rising worldwide, the Toray Group aims to employ zero-emission power sources at a rate equivalent to or better than the targets in each country by 2030.



Toray Group Sustainability Vision PDF 1.01MB

## Dialogue with Thought Leaders

# Fulfilling the Corporate Philosophy with a Focus on the SDGs

## Contributing to the Resolution of Global Issues with Innovative Technologies and Advanced Materials

With a history stretching back to 1926, the Toray Group has come a long way thanks to its spirit of contributing to society through its business.

In 2015, the Sustainable Development Goals (SDGs) were adopted at a United Nations Summit, designating 17 global social issues as targets that the entire world should work on together.

With this background, in 2018 we again invited some important thinkers to exchange views on Toray's corporate philosophy and the SDGs with members of Toray's Board of Directors and other Toray leaders.

## Milestones in the Toray Group's philosophy

- 1926 · · · Toray was launched to manufacture rayon (rayon made of wood pulp was the world's first chemical fiber).  
Yunosuke Yasukawa, who founded the company, stated his hopes that the company would generate "major benefits for the national economy."
- 1955 · · · Company principle of contributing to society established.
- 1986 · · · Corporate philosophy, "Contributing to society through the creation of new value with innovative ideas, technologies and products," established.



Thought leaders

Front row

**Kaori Kuroda**, Executive Director, CSO Network Japan

**Tetsuo Kondo**, Director, UNDP Representation Office in Tokyo

Toray Industries, Inc.

Rear row

**Yukichi Deguchi**, Executive Vice President and Representative Member of the Board, General Manager, Corporate Strategic Planning Division (center left)

**Hideki Hirabayashi**, Vice President, Chief CSR Officer, Director, General Administration & Communications Division (center right)

**Shigeki Taniguchi**, Vice President, General Manager, Personnel & Industrial Relations Division (second from the left)

**Toshiyuki Nonaka**, General Manager, Global Environment Business Strategic Planning Department (left)

**Toshinori Hara**, former General Manager on Special Assignment, Life Innovation Business Strategic Planning Department (right)

**Naohiko Yamasaka**, General Manager, Environment & Safety Department (second from the right)







**Hirabayashi** : We believe that companies must take the expectations of diverse stakeholders seriously and manage operations accordingly in order to be essential to society in the medium to long term. At the same time, it is not enough for us to simply see society's expectations for the perspective of our daily operations. This is a truly important opportunity to hear the views of these two thought leaders, who are so familiar with the global social issues which Toray is expected to help resolve going forward, especially when it comes to living up to our corporate philosophy, "Contributing to society through the creation of new value with innovative ideas, technologies and products."

In last year's dialogue, the thought leaders we invited stated that Toray should articulate its long-term vision with reference to the SDGs, recognize the importance of human rights due diligence, and pursue initiatives encompassing the supply chain. In the year since then, we have put in place the Toray Group Sustainability Vision, which includes quantitative targets for 2030, and established the Toray Group Policy for Human Rights.

I hope that this time you will give us recommendations on the points related to the SDGs that we should strengthen as we work to resolve global issues.

SDGs and Toray Initiatives		
	SDGs	Toray Initiatives
	End hunger, achieve food security and improved nutrition and promote sustainable agriculture	<ul style="list-style-type: none"> <li>Green Innovation businesses (Roll Planter™ pilot project)</li> </ul>
	Ensure healthy lives and promote well-being for all at all ages	<ul style="list-style-type: none"> <li>Life Innovation businesses</li> <li>Preventing air pollution at plants (Reducing atmospheric emissions of chemical substances)</li> </ul>
	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	<ul style="list-style-type: none"> <li>Supporting science education at schools</li> <li>Holding workshops at the Science Museum, etc.</li> <li>Providing awards for science teachers via the Toray Science Foundation and Toray science foundations in three Southeast Asian countries and South Korea</li> </ul>
	Achieve gender equality and empower all women and girls	<ul style="list-style-type: none"> <li>Initiatives for advancement of women (Toray Industries, Inc.)</li> <li>Supporting events to develop female students in science and engineering majors</li> </ul>
	Ensure availability and sustainable management of water and sanitation for all	<ul style="list-style-type: none"> <li>Green Innovation businesses (Securing drinking water using water treatment membranes)</li> <li>Water usage management at plants</li> </ul>
	Ensure access to affordable, reliable, sustainable and modern energy for all	<ul style="list-style-type: none"> <li>Green Innovation businesses (Supporting the widespread use of renewable energy)</li> </ul>
	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	<ul style="list-style-type: none"> <li>Helping employees maintain work-life balance</li> <li>Promoting employment of persons with disabilities and the elderly</li> <li>Respecting human rights through the Toray Group's CSR Procurement Guidelines, etc.</li> <li>Establishment of Toray Group Policy for Human Rights</li> </ul>



	<p>Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation</p>	<ul style="list-style-type: none"> <li>• Providing grants for young researchers via the Toray Science Foundation and Toray science foundations in three Southeast Asian countries and South Korea</li> </ul>
	<p>Make cities and human settlements inclusive, safe, resilient and sustainable</p>	<ul style="list-style-type: none"> <li>• Green Innovation businesses (Wooden roof reinforcement with aramid fiber Kevlar®, etc.)</li> </ul>
	<p>Ensure sustainable consumption and production patterns</p>	<ul style="list-style-type: none"> <li>• Green Innovation businesses (Bio-resource utilization / promotion of product recycling)</li> <li>• Reducing wastes at manufacturing sites</li> </ul>
	<p>Take urgent action to combat climate change and its impacts</p>	<ul style="list-style-type: none"> <li>• Green Innovation businesses (Curbing CO<sub>2</sub> throughout product life cycles)</li> <li>• Reducing CO<sub>2</sub> at manufacturing stage</li> </ul>
	<p>Conserve and sustainably use the oceans, seas and marine resources for sustainable development</p>	<ul style="list-style-type: none"> <li>• Preventing water pollution at plants</li> <li>• Green Innovation businesses (waterless printing technology)</li> </ul>
	<p>Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels</p>	<ul style="list-style-type: none"> <li>• Initiatives under the Toray Group Biodiversity Basic Policy</li> <li>• Survey on bio-based raw materials in procurement</li> <li>• Initiatives under the Toray Group Basic Policy for Increasing Green Areas (Greening at plant sites, etc)</li> <li>• Environmental preservation activities at head office and plants</li> </ul>

Note: Roll Planter™ is a registered trademark of Mitsukawa Co., Ltd. Kevlar® is a registered trademark of E.I. du Pont de Nemours and Company.

## The Toray Group Sustainability Vision—Helping to Achieve the SDGs

**Kuroda** : It is very significant that you have now set out your vision for 2050 and setting specific quantitative targets for 2030. Even when the future outlook is not completely certain, establishing aspirational targets has a great deal of impact due to your position as a leading company.



**Kondo** : Speaking as someone who is involved at the UN in promoting private-sector partnerships to achieve the SDGs, Toray's corporate philosophy has long reflected your aim to give back to society through the creation of new value. I truly feel that Toray is constantly striving to identify the value it can offer the world. I believe it is extremely important that you make sure that your efforts to raise business revenue in your main operations naturally lead to contributions to the SDGs.

It is estimated that the effort to achieve the SDGs will create US\$12 trillion (about 1,300 trillion yen) annually in corporate business opportunities by 2030.

**Deguchi** : Right now, Toray is determining the major new business themes for the future that will support the Toray Group going forward and is engaged in a variety of related group-wide projects. The majority of these themes, such as resolving global environmental issues and contributing to health and longevity, are directly related to the SDGs.



In this sense, although the SDGs are a recent development, Toray has actually been working to resolve the global issues the SDGs target since much earlier, as part of its efforts to achieve its corporate philosophy. I think this means that Toray is well positioned to help achieve many of the goals. However, I would like to see Toray go beyond its current achievements. With the SDGs as the global agenda of the international community, Toray ought to strive to make even greater contributions in order to more completely fulfill its corporate philosophy.

**Kuroda** : The Toray Group has been involved in addressing global issues for many years in line with its corporate philosophy, and it has already made substantial contributions to the areas targeted under the 17 SDGs. To take it higher, you would be well served by enhancing the integration between your identified material issues and the SDGs. Moreover, one of the most important features of the SDGs is inclusivity, emphasizing that no one should be left behind. I hope that Toray will grow its business with all people in mind, including the populations of developing countries.

**Yamasaka** Setting targets for the reduction of greenhouse gas emissions was an extremely important and difficult task in formulating the Toray Group Sustainability Vision. Since Toray is a materials manufacturer, our energy consumption is very high at chemical plants and other sites, so our greenhouse gas emissions are inevitably substantial. We have grappled with this troubling situation by repeatedly trying different solutions.

**Hirabayashi** : Toray has a corporate culture that embraces repeated and serious discussion of the conditions we face and examines and sets targets with the conviction that we can achieve them. Given that climate change is a truly grave global issue, we set challenging quantitative targets to express our commitment to really making a difference.



**Kondo** : It is extremely difficult to grow a business while reducing CO<sub>2</sub> emissions, but in Toray's case, the fight against climate change has become a business opportunity. I think that Toray is in the midst of a paradigm shift, reexamining its existing values while working on its initiatives.

## Aiming for True Innovation

**Nonaka** : Using innovation to grow our business while fulfilling our responsibilities to the environment definitely helps to achieve the SDGs and also represents a business opportunity. It gives employees a sense that they are participating on the job in the SDGs effort, which makes them even more motivated and encourages them to keep working hard.

**Hara** : In other sectors such as healthcare, medical costs inevitably rise as healthcare advances are made; yet as demands that medical costs be reined in mount up, these advancements themselves become an issue. We sense these contradictions in business quite often, but true innovation is able to resolve these kinds of contradictions. We want to create breakthroughs with truly innovative solutions, while obtaining the cooperation of people in the public sector.

## Initiatives to Promote Respect for Human Rights Worldwide

**Kuroda** : The world expects global companies to fight climate change and ensure respect for human rights along the supply chain. In such circumstances, it is also very significant that the Toray Group Policy for Human Rights was established in fiscal 2017. Respecting human rights in the overall supply chain means formulating and then publicizing a solid policy, the initiatives you will take for suppliers, and how you will handle any negative human rights impacts.

**Taniguchi** : Several of the 17 SDGs are related to employment issues. We have traditionally valued hiring, and we have very much emphasized our dialogue with labor unions in the process.



Taking action on the comments made by the thought leaders at last year's dialogue, in December 2017 we established the Toray Group Policy for Human Rights. Our business stretches across Asia, including China, India and Southeast Asia, as well as countries in the Middle East, Europe, North America and South America—and must

therefore be sensitive to an extremely broad range of human rights approaches and cultures. We intend to ensure that our human rights policy is incorporated into our operations in all of the countries in which we do business.

Our supply chain is very broad in the fiber/textile and other businesses, so we will start nearby and work outward from there.

## Securing Enough Revenue to Provide New Value for Society

**Kondo** : If I could share a metaphor, I would describe a company's goal of raising revenue as not simply to provide dividends, but to climb the "mountain" of offering value to society. Making this climb requires energy, and I think that revenues represent this energy.



Imagine a double-decker bus climbing this mountain of offering value to society. On the second deck of the bus sit the people who take a long-term view, craft overall strategies, and give instructions. On the first desk, we have people who monitor what lies right in front of them and steer safely, people who collect fares from the passengers, and other team members who play various roles. The strengths of all are required to get the bus up the mountain.

I have high hopes that everyone at Toray will further accelerate efforts to boost business earnings, while strengthening contributions to social issues, so that we can make major contributions to the achievement of the SDGs.

**Hirabayashi** : Thank you very much for all of your thoughtful observations.

Toray will use these valuable insights to run the company in a way that directly responds to social expectations.

# Contributing to Society by Creating Innovative Technologies and Advanced Materials

## Message from the CTO: The Passion That Drives Toray R&D



**Koichi Abe**

Executive Vice President and Representative Member of the Board, Chief Technology Officer, Toray Industries, Inc.

## Toray R&D—Creating New Value and Changing Society

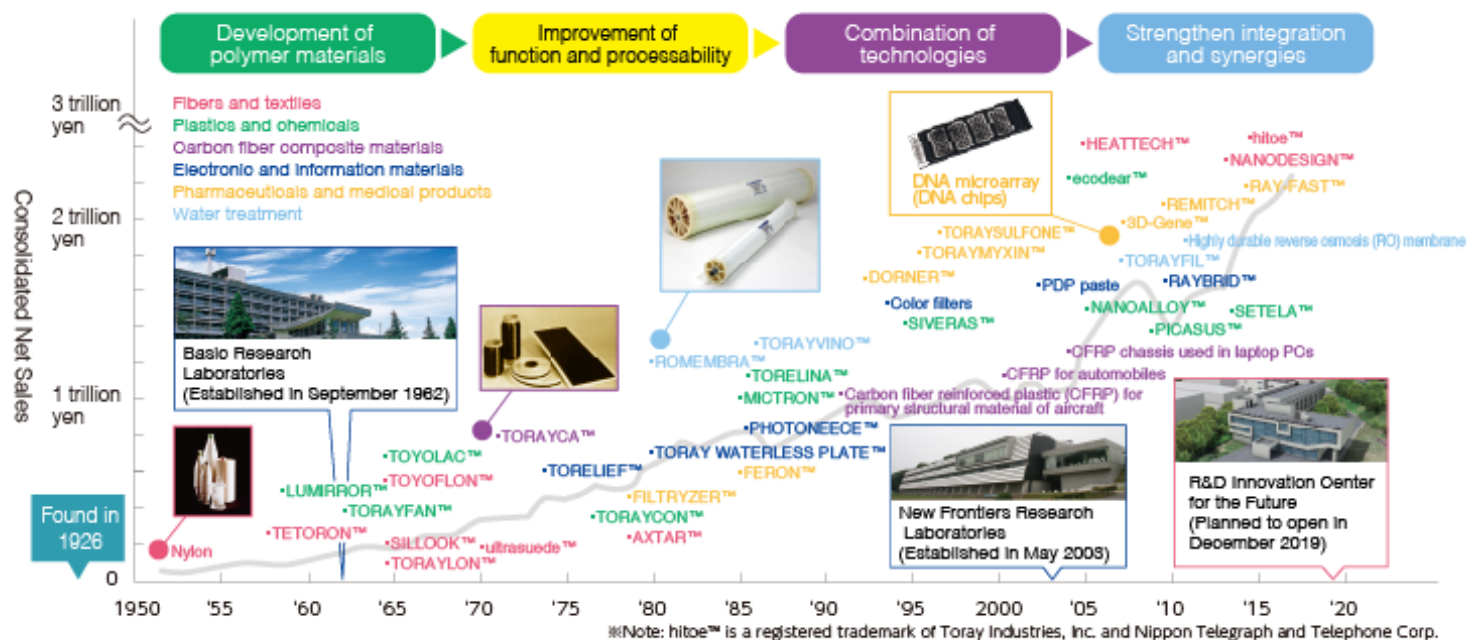
Looking back on the history of Toray's growth, it is clear that R&D has played a critical role. The innovative technologies and advanced materials Toray has created have made new businesses possible and truly impacted society for the better.

The advanced materials that we create may not be conspicuous—they often go unseen inside automobiles, computers, and other products for end-users. Despite being hidden, Toray materials are an integral support for today's IT industry. The invention of synthetic polymers gave rise to synthetic fibers; the invention of semiconductors led to transistors and integrated circuits. History shows that the creation of advanced materials leads to new industries, and that this in turn changes people's lives and entire societies.

Toray got its start in 1926 as a producer of rayon. Made from wood pulp, rayon is the first chemical fiber in human history. The Company was founded as part of the effort to establish domestic rayon production in Japan. This same entrepreneurial and pioneering spirit continues to be part of the very fabric of Toray R&D.

Since those early days, we have gone on to create many innovative technologies and advanced materials. Over the last 90-plus years, Toray has expanded into five business segments: fibers & textiles, performance chemicals (resins, chemicals, film, electronic & information materials), carbon fiber composite materials, environment & engineering, and life science and other businesses. Today, the company turns in a total of more than 2 trillion yen in annual sales in these five business segments.

## History of Toray Business Expansion & Technology Development



## All Derived from Toray's Four Core Technologies

At first glance, Toray may seem to be diversifying into a variety of different business segments. The fact, however, is that all of our diverse businesses grew out of the same four core technologies. The innovative technologies and advanced materials derived from these core technologies are utilized in sectors varying from fibers and textiles to life science. Toray's current business development model is, as you can see, based on these four core technologies.

### Sources of Toray's R&D Strengths

#### 1. Management

##### Continuously Planting Seeds of New Value

When managers think only of immediate gains and invest management resources solely in R&D projects designed to bring products to market quickly, operating profits may rise in the short-term, but the company will inevitably run out of seeds to grow future business.

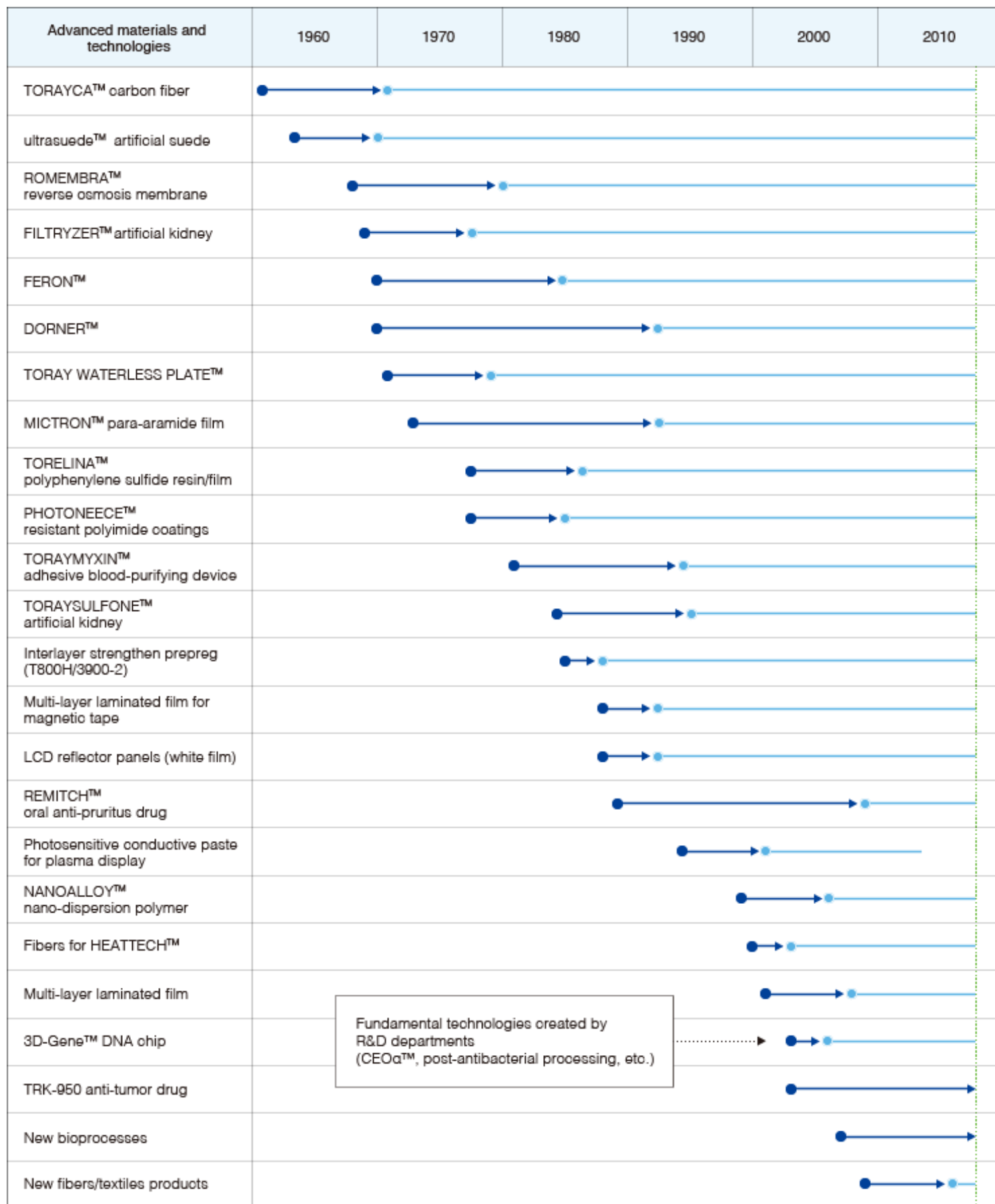
It can take decades from R&D to product launch and then building up a significant market. For example, it took nearly 50 years from the start of research to the establishment of a substantial market for TORAYCA™ carbon fiber composite material, one of Toray's mainstays today. The ROMEMBRA™ reverse osmosis membrane for water treatment took about the same amount of time.

This is why it is vital that management resources be allocated properly to the R&D activities needed for the next new product, the product after that, and the one after that. Building a solid R&D pipeline is crucial.

Toray has steadily focused on building a solid pipeline over many years, cultivating a wealth of seeds for future businesses. One after another, as these seeds sprout and grow, we will continue to help solve the issues the world faces, and this, in turn, will ensure that Toray itself continues to grow.

# History of Toray Advanced Materials Development

● : Research begins    ● : Product brought to market



## **Investing in R&D in both Easy and Difficult Times**

Research and technology development are not costs; they are investments. Toray has also faced difficult periods in the past that have shaken its financial footing. Even so, we have consistently increased our R&D investments since the late 1980s, in line with growth. Toray currently employs some 4,000 researchers and engineers with an annual budget of approximately 70 billion yen.

Our approach has been to continuously invest in R&D regardless of economic conditions in the moment. This approach is a foundational principle of Toray management, one which has never changed since the beginning. Since we stick to this approach even amid tough business conditions, nearly all of our researchers and engineers stayed with Toray during the period when the best engineers were leaving Japanese companies for firms in emerging countries. I believe our researchers and engineers stayed thanks to the mutual trust developed over many years. It is the Company's steady R&D investment that creates new value for the next generation and leads to sustainable growth, and this value has become deeply embedded in the organization through our history of successes.

## **Meeting the Demands of the Times, Above All**

Since its founding, the Toray Group has continuously carried out R&D on advanced materials, based on the firm conviction that R&D is the key to the Toray of tomorrow. Our most important criterion for selecting R&D themes is whether it meets the demands of the times.

Take carbon fiber as an example. Toray began R&D on this material in 1961 when passenger jets had first begun to appear. Having to overcome gravity, airplanes had to be, above all, light and strong. We had a strong conviction early on that light, strong carbon fiber could meet this social demand.

Moreover, when we steered R&D toward water treatment membranes that make desalination possible, the population was projected to grow on a global scale, and demand for food and water would naturally increase dramatically. Fresh water makes up only 2.5% of the earth's water, and this would not be enough to meet demand. It was clear that demand for technology to desalinate seawater, which accounts for 97.5% of water on earth, would emerge. In the nearly 50 years since, we have persistently pursued R&D, delivering Toray water treatment membranes that have provided water to 420 million people.

The second criterion is whether the technology we develop is inherently competitive and whether that competitiveness will be sustainable over the long term. To that end, it is important to know whether there are substantial barriers such as intellectual property. These are the two criteria Toray uses to select R&D themes that will support future generations.



Toray was selected as one of the 2017 Top 100 Global Innovators by Clarivate Analytics, a global information services company formed in a spin-off of the intellectual property business division of Thomson Reuters). This is the second time that Toray has been chosen for the list, following the first year in 2015.

Clarivate Analytics analyzes trends in intellectual property and recognizes the most innovative companies and institutions in the world. The ranking is based on four axes of evaluation: volume, success (approximately equivalent to the success of applications), globalization, and influence. It primarily looks at data on patents held by companies, reviewing records for more than 50 million patents issued by 50 patent authorities around the world.

The Toray Group was selected for the list in 2017 in recognition of the improved quality of its patents, as well as its efforts to strengthen patents outside Japan.



## **Top-Level Commitment to Accelerating Global Collaboration**

To maximize the new value we create and deliver it around the world, we seek to strengthen and accelerate collaboration with stakeholders across the value chain.

For example, the Toray Group supplies carbon fiber and other innovative technologies to Boeing for its 777 and 787 aircraft. The CTOs from the two companies meet regularly to drive the creation of next-generation aircraft, and this top-level commitment has been accelerating joint efforts from material development to processing for the aircraft.

Another example is the development of TRK-950, a potential new treatment for cancer. We regularly hold top-level talks with leading experts in cancer treatment in Europe and the U.S. The strong support of these experts is helping with the progress of clinical trials.

## **2. Organization**

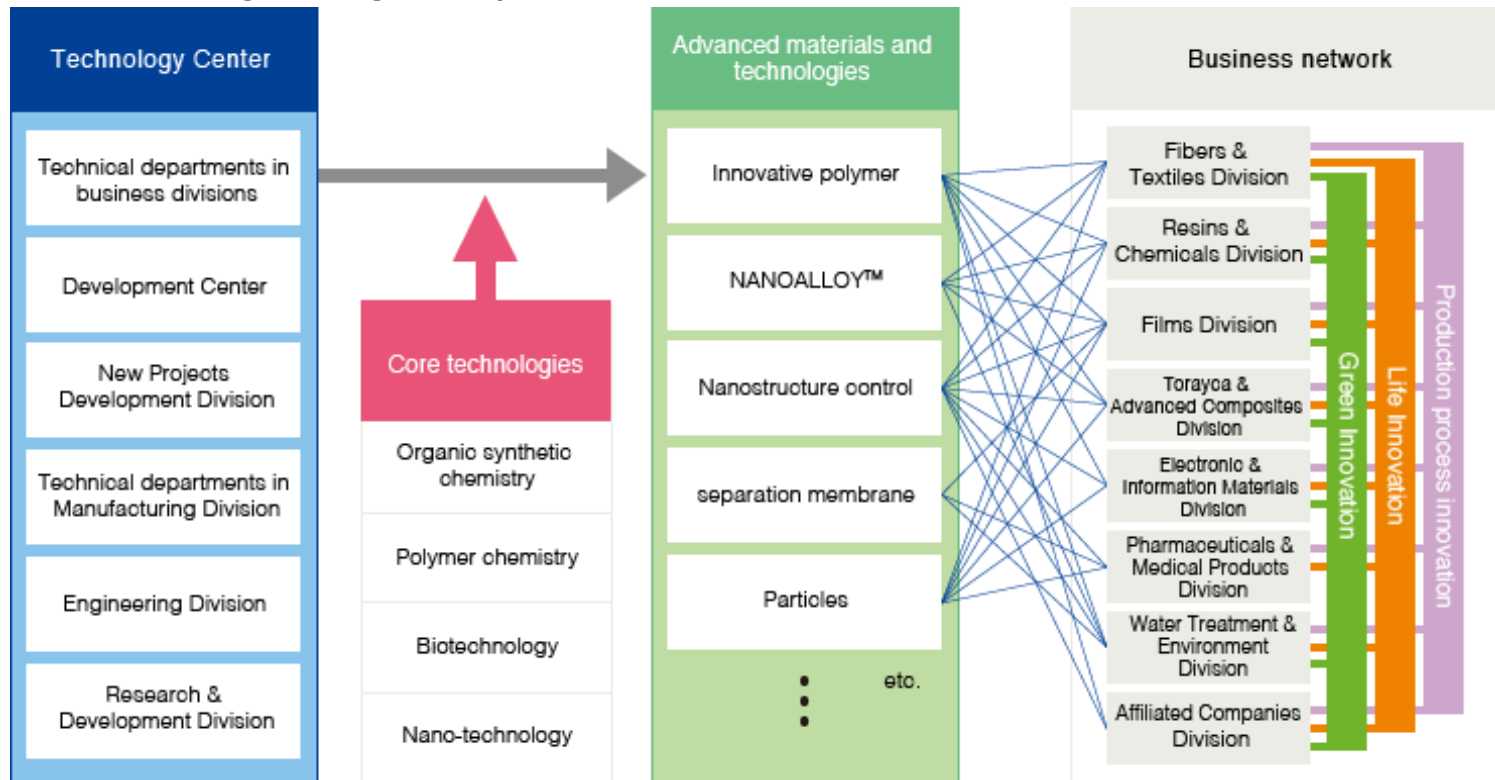
### **Undivided Single-Package R&D System**

The most salient feature of Toray's research and technology development is its undivided single-package R&D system. Although generally lumped together as R&D, this system covers a variety of worksites. The Research & Development Division drills the wells of discovery in vast fields. The New Projects Development Division and the Development Center blaze the trail to market. Technical departments belong to the business divisions and the Manufacturing Division. The Engineering Division provides facility support for technology development and formulates the manufacturing system.

Thus, rather than positioning those R&D functions entirely within business divisions such as Fibers & Textiles or Films, we centralized them into an undivided, single-package R&D system called the Technology Center, which I oversee as CTO. This system is a feature unique to Toray R&D.

This single-package system has three significant impacts.

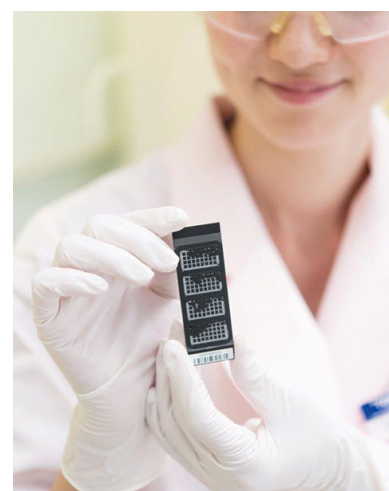
### An Undivided Single-Package R&D System



## Accelerating the Integration of Technologies

The first impact is that such a system makes it extremely easy to integrate technologies. Considerable progress has recently been made in specific fields of research and technology, and it is becoming difficult to produce major innovation using only a single innovative technology. Moving forward, integrating technologies will be increasingly vital to achieving innovation. This is unlike structures that divide R&D by individual business segments, which make it difficult to integrate technologies.

DNA chips, for example, are expected to make early detection of various types of cancer possible by detecting trace amounts of microRNA that each type of cancer cell specifically releases, using only small amounts of blood. We are currently accelerating the development of these chips for practical application. In addition to the biotechnology itself, we integrated nanotechnology. Our nanotechnology made it possible to align the DNA for detection in a structure of fine columns of 100- $\mu\text{m}$  precision and fix it at high density. This allows these chips to detect microRNA with an



DNA chips

extremely high degree of sensitivity, 100 times better than conventional chips. It is said that cancer will strike one in two people in Japan. As the populations age in many countries—not only in the developed world, but across the globe—highly sensitive DNA chips hold exceptional promise for early detection. Without technology integration, tools like these would not exist.

Looking to accelerate technology integration even further, Toray is currently constructing its R&D Innovation Center for the Future, scheduled for completion in 2019.



R&D Innovation Center for the Future (architectural drawing)  
Scheduled for completion in December 2019

## **Multiplying Business Applications of Each Innovative Technology/Advanced Material**

The second benefit of a single-package system is that it makes it possible to multiply the applications of a single innovative technology or advanced material across several businesses.

With businesses in fields ranging from fibers, textiles, and resins to life science, some observers have said Toray is not being selective in concentrating on the businesses it develops. This, however, is not the case. Just as steelmakers and aluminum manufacturers supply iron and aluminum for various products, including airplanes, automobiles, and home appliances, we research and develop basic chemical materials, not final products. For example, we develop innovative polymers for high value-added film. These innovative polymers can, in fact, be used in both fibers and resins. By leveraging our single-package system to apply single innovative technologies or advanced materials across multiple businesses, we seek to maximize the return on our total R&D investment of some 70 billion yen a year.

## **Cross-Sector Collaboration Delivers Breakthroughs**

The third impact of the unique Toray structure is that we achieve breakthroughs to problems encountered in one business segment by using the technologies and expertise cultivated in other business segments. There are many examples of this. Our medical researchers, for instance, have used their technology and expertise in organic synthetic chemistry, a significant fundamental technology in medical research, to resolve issues related to carbon fiber—an entirely different field. In a system organized into separate business divisions, it is impossible for researchers in different fields to solve problems by sharing their knowledge with each other. This is another advantage offered by the single-package R&D system. In order to maximize the strengths that come from different business segments cooperating and collaborating, the Technology Center coordinates between departments to create a framework that accelerates the resolution of key challenges.

### **3. The DNA of Toray Researchers and Engineers**

#### **Intense Tenacity and Pursuit of the Ultimate Limits (The Deeper, The Newer)**

The DNA of Toray researchers and engineers can be described with two key phrases: intense tenacity, and the pursuit of ultimate limits (“the deeper, the newer”). “The deeper, the newer” is Kyoshi Takahama’s phrase and refers to the idea that new discoveries come by digging deeply into one specific subject.

For example, active research into carbon fiber began in 1961. The initial goal was to produce carbon fiber to be adopted as structural material for aircraft, but at the time the market for carbon fiber was almost non-existent. We therefore focused tenaciously on honing this technology by working on carbon fiber for fishing rods and golf clubs, while generating cash flow. Quite a bit of the feedback we received from our fishing rod and golf club customers regarding ways to improve the products and enhance performance was harsh. However, we listened carefully to their voices and went back again and again to make improvements. As a result of this intense tenacity, Toray ultimately tripled the strength and flexibility of its carbon fiber. Over this same period, a number of leading chemical companies around the world worked to develop carbon fiber technology, but they abandoning the work and withdrew from the field, one after another.

In 2003, over 40 years since we started this research, the Boeing 787 project began, and our carbon fiber now flies the skies the world over. We have expanded applications to include use in automobiles and currently hold the largest share of the world market.

I believe that the future of carbon fiber composite material is its application in buildings. This material will replace reinforced steel and concrete for use in light but strong skyscrapers. The result will give rise to a variety of possibilities, not only reducing overall cost and environmental impact throughout the entire life cycle from transport of raw materials through construction, but also better safety and less damage to buildings. A myriad of issues must still be resolved before application in this sector can be achieved, but I am certain there is still a great deal of potential for carbon fiber composite materials going forward.

#### **The Inner “Frontier”**

The frontier for R&D does not, in fact, lie solely with the cutting edge of science and technology. The fiber industry, for example, is one that dates extremely far back, but digging deeply in the same field, as we did to develop the new HEATTECH™ material, makes possible new innovations that change people’s lives and help make them more comfortable.

Note: HEATTECH™ is a registered trademark of FAST RETAILING CO., LTD.

# An Open and Dynamic Corporate Culture

## —Encouraging Curiosity-Driven Research, Rather Than Requiring Permission

The researcher's mission is to dig the well initially in an expansive field of study. In order to heighten their sensitivity and enhance their originality, researchers need a relaxed environment that leaves them a great deal of discretion.

Toray has long valued curiosity-driven research, allowing about 20% of working hours to be used as the researcher wishes without being required to report to their boss. This framework makes it possible for researchers to conduct whatever preliminary experiments and tests that they come up with, even if the subject is not otherwise adopted as a research topic. The idea behind this is to encourage researchers in their pursuits, rather than require them to get permission for everything they do.

Our work in carbon fiber, in fact, came about thanks to the discretion of a researcher doing this kind of curiosity-driven research, when that person quickly appreciated the value of an original invention by Dr. Akio Shindo of the Government Industrial Research Institute, Osaka (now the National Institute of Advanced Industrial Science and Technology) and initiated serious research. Many of the major products that generate large profits for Toray, such as films for liquid crystal reflector plates and our ultrasuede™ (artificial suede), were also born of curiosity-driven research.

I have personal experience with this. My curiosity-driven research during my days working on films led to a solution for a problem that had plagued film manufacturers for many years. In order to improve recording properties, film for video tape was required at the time to have a smooth surface. However, making the surface smooth degraded the way in which the tape moved through equipment, and this dilemma between recordability and running performance had been a problem. The technology that solved this issue was thin film multilayer technology (NEST), which emerged from my curiosity-driven research. NEST technology aligns particles on the film's surface to form fine protrusions by controlling the surface roughness on the order of 10 – 20 nanometers to achieve both recordability and good transport.

What spurred this research was the idea of coming up with a topic in the fuzzy front-end phase (an ambiguous and imprecise world). In order to create a substantial research theme, researchers need a framework that respects their originality in promoting basic and fundamental research.

# Organizational Management that Enhances Creativity and Motivates Researchers and Engineers

Although lumped together as R&D, conducting research and conducting development have completely different characteristics. Recognizing this, Toray thinks less in terms of R&D, and more in terms of “research” on the one hand and “development” on the other.

Research aims for a breakthrough that goes from zero to one, or makes something from nothing, while the goal of technology development is to create a product of a target quality within a set time and at a set cost. Toray’s research tradition is to provide organizational management that enhances the creativity of and motivates researchers, while still guiding the research with a clear direction.

Evaluating basic research is, as a rule, a matter of determining points of merit. Fundamental and exploratory research inevitably involves a series of failures. If we used a penalty point system, researchers would not set challenging goals. Toray’s framework allows our researchers to obtain advanced specializations. For example, we honor as Research Fellows those individuals who are opinion leaders in their fields and whose approach to and conduct around research provide excellent modeling for our entire team of researchers. Toray currently has seven such Research Fellows, and they serve as role models for our junior researchers as they engage in constructive competition. In the field of engineering, we also honor engineers who demonstrate specialized leadership as Engineering Fellows (currently two).

We also look closely at the day-to-day conduct of our researchers and engineers and actively commend those who go out of their way to help others with R&D. To keep research and technology development energized, it is critical that corporate executives get into the labs to see up close what is happening. We believe it is important for management to interact regularly with researchers and engineers, so we hold meetings between the president and junior staff members to keep our team motivated and maintain the foundation for continuous innovation.

Achieving intense tenacity requires passing on know-how to the next generation of researchers and engineers. Both innovative ideas and accumulated knowledge and experience are needed to achieve innovations in the field of new materials. It is for this reason that we consciously pair veteran staff members with junior employees.

[Research Fellows and Engineering Fellows](#) 

# Focused Entirely on Contributing to Society through the Creation of New Value

These R&D strengths both embody and pervade the Toray corporate philosophy of “contributing to society through the creation of new value with innovative ideas, technologies and products.”

It is only technological innovation that can deliver true solutions to many of the social and economic challenges we face, and without innovation in materials, appealing end products are not be possible.

Toray has a substantial staff of outstanding R&D specialists responsible for developing our next-generation businesses, and we continue to cultivate these researchers and engineers. We are committed to continuing to provide innovative technologies and advanced materials that demonstrate Toray strengths to their fullest and change society for the better.



## Fiscal 2017 CSR Highlights

The CSR Highlights section covers the Toray Group's efforts in fiscal 2017 to leverage the power of materials to build a sustainable world and promote science education for a sustainable future.



### Contributing Solutions to Social Issues through Business Activities

Learn about how the Toray Group's businesses leverage advanced materials to address environmental issues, contribute to the quality of medical care, and promote healthy living.

### Social Contribution through Science and Technology

Find out about the Toray Group's efforts around the world for science and technology promotion, which is one of its priority social initiatives.

## CSR Highlights Archive

[> Fiscal 2016 CSR Highlights](#)

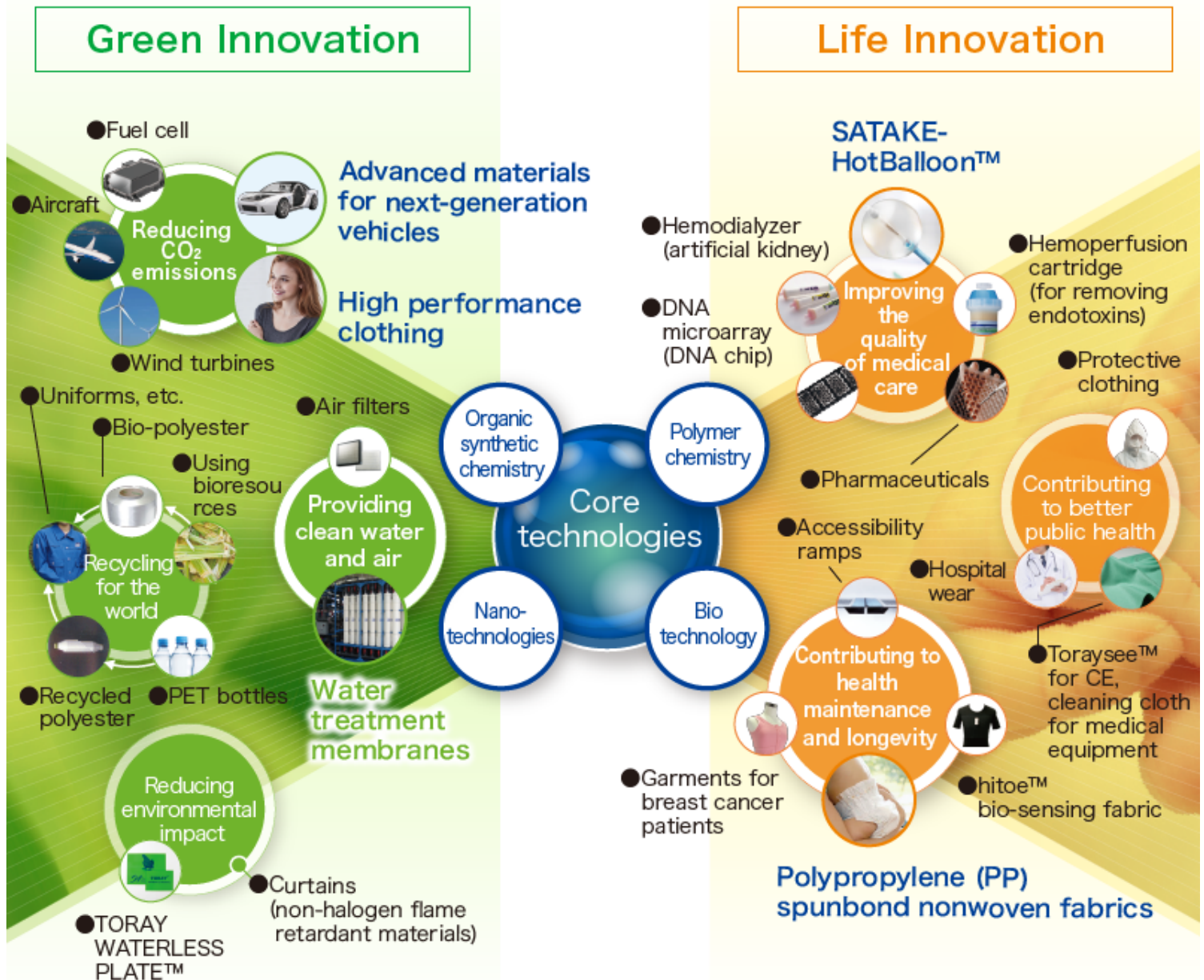
[> Fiscal 2015 CSR Highlights](#)



Fiscal 2017 CSR Highlights

# Contributing Solutions to Social Issues through Business Activities

The Toray Group leverages its advanced materials and innovative technologies, using the power of materials to help solve global-scale issues. Toray's Green Innovation businesses focus on measures for curbing global warming and conserving resources, and its Life Innovation businesses seek to improve public health and medical care and to promote health maintenance and longevity. These group-wide projects are contributing solutions that are making the world more prosperous and sustainable.




## Green Innovation

The global community must act collectively to find solutions to global environmental, resource and energy issues. The Toray Group has long focused on addressing these issues by creating new value and developing innovative technologies. The Group introduced the Green Innovation Project in 2010 to strengthen its efforts in this area. Businesses under this project focus on building a sustainable world by developing products and services that help curb global warming, purify water, and effectively utilize resources.




**Advanced materials for next-generation vehicles  
Contributing to Safe, Comfortable  
Cars with Low Environmental Impact**

▶ MORE



**Water treatment membranes  
Helping to Solve Water Shortages  
with Advanced Membrane Separation Technology**

▶ MORE



**High performance clothing  
Better Clothing Insulation for a  
Lifestyle Less Dependent on Heating**

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## Environmental impact categories for Green Innovation products

Environmental impact categories	Basic concept	Main products and technologies
Energy-saving	Products that reduce the energy consumed throughout their life cycle	Carbon fiber for automobiles, aircrafts, and pressure vessels; cooling and insulating micro fibers; photosensitive functional materials
New energy	Any parts, materials, and technologies used in industries relating to new energy	Carbon fiber for wind turbines, separators for lithium ion batteries
Biomass-derived	Products derived from non-petroleum raw materials	Bio-based PET; 3GT fibers; polylactic acid for textiles, plastics, and film
Water treatment	Parts, devices, and systems, etc. used in water treatment	Reverse osmosis (RO), ultrafiltration (UF) and microfiltration (MF) membranes; TORAYVINO™ home-use water filter
Air purification	Parts, devices, and systems, etc. used in air purification	Dust collecting filters and air filters
Low environmental	Products that control the emissions or use of	Non-halogen flame retardants for fibers,

impact	hazardous substances	textiles, plastics, and films; TORAY WATERLESS PLATE™
Recycling	Products made from recycled materials or featuring a recyclable design	Reusable and recyclable products; material and chemical recycling technologies
Process innovation	Innovative manufacturing technology that greatly reduces the environmental impact of an existing process	Chemical processes that reduce gas emissions

## Life Innovation

The aging of the population in Japan and other countries is casting a spotlight on health-related issues such as lifestyle diseases and the rising cost of medical care. The Toray Group's Life Innovation project aims to help people live long and healthy lives by integrating the advanced materials technology that Toray has been developing since its establishment with its core technologies and expertise across a broad range of business segments, to improve medical technologies, develop preventative treatments, and reduce the burden on medical staff. The Toray Group is actively collaborating with research institutes, medical institutions, and partners in other industries to accelerate the use of Toray materials and technologies.



Polypropylene (PP) spunbond nonwoven fabrics  
**Improving Quality of Life  
 for People in Asia**

▶ MORE



SATAKE-HotBalloon™  
**Reducing the Burden on Patients**

▶ MORE

## Brand Mark

The Life Innovation brand mark design employs the first letter in “life” and “innovation” to form an exclamation mark, representing innovations that will excite and bring smiles to people. The letter “i” represents people, with the dot representing Toray’s technology innovations in the field of nanotechnology and all the other minute components which make up the power of chemistry, such as molecules, cells, substances, reactions, and structures. The dot also symbolizes Toray’s dedication to supporting the well-being of people and society by contributing in the areas of pharmaceuticals, medical care, health maintenance, and longevity.

## Fiscal 2017 CSR Highlights

### Green Innovation

# Contributing to Safe, Comfortable Cars with Low Environmental Impact

## Advanced Materials Changing the Social Significance of the Automobile

In the automotive industry, technological innovations are leading to better safety and driver support functions, as well as lower environmental impact. Meanwhile, as traffic in urban areas becomes a chronic problem due to economic development, certain countries and regions are promoting the adoption of electric vehicles (EVs) to counter air pollution. To address trends like these, Toray set up the Automotive Material Strategic Planning Department in 2006. This department proposes applications for the Toray Group's wide range of advanced materials for next-generation vehicles. The key concept is "cars evolve through materials," and the four key words are "weight reduction," "electrification," "safety" and "comfort."



**Yukio Ishino**

Director, Automotive Material Strategic Planning Department, Toray Industries, Inc.

## Toray's Concept Car: TEEWAVE™ AC1

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Toray demonstrates its automotive solutions under the brand TEEWAVE™ by combining cutting-edge materials and advanced technologies to meet every need when it comes to cars. The TEEWAVE™ AC1 concept car brings together the Toray Group's technology and advanced materials to showcase the transformative potential of the Group's advanced materials.

## Weight reduction

- Exterior made of carbon fiber (roof, pillars)
- High-performance plastic parts in engine room



- Hydrogen tank made of carbon fiber that safely store high-pressure hydrogen



## Electrification

- High heat resistance, PPS binding strings for use with motors with advanced electrical insulation properties, sleeves, insulating film



- Separator film for lithium ion batteries
- Carbon paper used in the electrode base materials of fuel cells

## Safety

- Crash pad using NANOALLOY™<sup>1</sup> resin-based impact-absorbing materials



- Plastic optical fiber for collision sensors that help protect pedestrians
- Film for bonding different types of materials for use in a range of sensor equipment
- Nylon fiber and fabric for use with high-strength, flexible airbags

## Comfort

- Synthetic suede seats with excellent design and breathability



- Air filter for cabins that removes pollen and PM2.5 particles
- Upholstery materials for interiors using polyolefin foam sheet that is lightweight and has excellent insulation and cushioning
- Interior decoration using metallic luster film that is made without metal vapor deposition and compatible with curved surface molding

1. NANOALLOY™ technology is an innovative microstructure control technology developed by Toray that can bring about dramatic improvement in performance compared to conventional materials by minutely dispersing multiple polymers on a nano-metric scale.

## Resolving Issues with Joint Development by Organizations within Group

The Automotive Center (AMC), based in Japan, proposes comprehensive solutions leveraging the materials the Toray Group provides for a wide range of automotive applications—from power units to interiors and exteriors. In 2018, Toray will open the Automotive Center Europe in Germany, a country home to some of Europe’s most advanced auto technology. AMC collaborates with automakers from the conceptual and design stages to provide total solutions, including not only materials but also processing methods, as well as design, evaluation and analysis technologies. The automotive materials needed differ depending on the country and region, as well as the manufacturer and application. The Toray Group always proposes the optimal materials after careful consideration of the performance and legal compliance required in each country and region, while taking into account where the car will be designed, manufactured and sold.

The automobile of today is evolving with the development and popularization of diverse powertrains, including the trend toward electrification, and with innovations in transportation based on the progress being made with self-driving technology. Meanwhile, demands for in-vehicle comfort and safety for passengers and pedestrians are higher than ever. To meet these expectations, the AMC, which provides the technology, and the Automotive Material Strategic Planning Department, which handles the marketing, work together to propose technological innovation using advanced materials.



Automotive Center (AMC)



Automotive Center Europe (AMCEU)

## **Pursuing Lighter Weight Cars to Reduce CO<sub>2</sub> Emissions**

The Toray Group focuses on reducing weight to enhance environmental performance, since this is a good way to reduce CO<sub>2</sub> emissions no matter what the vehicle's power source is. In the case of gasoline vehicles, which are still the most commonly used, making the car body lighter improves fuel economy, extends traveling distance per liter of fuel, and decreases CO<sub>2</sub> emissions. In electric vehicles (EVs), a lighter body means bigger batteries with greater capacity can be used, and this extends the driving distance, thereby hurdling one of the barriers to widespread use of EVs. The Toray Group uses resin and carbon fiber reinforced plastic (CFRP) to raise strength and deliver both lighter weight and lower cost, thus creating new value. This focus helps to resolve challenges in auto development and supports technological advancement. The Toray Group will continue to leverage the power of materials to change the automobile, both reducing environmental impact and improving safety and comfort.

## Fiscal 2017 CSR Highlights

### Green Innovation

# Helping to Solve Water Shortages with Advanced Membrane Separation Technology

## Water Treatment Membranes That Can Turn Wastewater into Drinking Water

Water shortages are becoming a serious problem faced by the entire world as a result of an increase in water demand attributable to population growth, as well as the impact of climate change. For over 50 years, the Toray Group has been using its membrane separation technology, in desalination and wastewater reuse applications, to provide potable and recycled water.

San Diego, California (population 1.42 million in 2017) has experienced severe water shortages due to a sharp rise in population and a drought that continued for several years. This was addressed by the city government in 2010 with the start of a wastewater treatment project to produce drinking water in the city by using ultrafiltration (UF),<sup>1</sup> reverse osmosis (RO) membranes,<sup>2</sup> and an advanced oxidation process. The Toray Group participated in this project together with Canada's H<sub>2</sub>O Innovation Inc. The impressive performance of the TORAYFIL™ hollow fiber UF membrane, which had been tested for over six years, was confirmed. The Toray / H<sub>2</sub>O Innovation team was selected to build the UF/RO systems that will provide drinking water to over 1 million people per day starting in 2021.

Treating municipal wastewater to drinking water standards is less expensive than treating seawater to drinking water standards. Treating wastewater with low pressure UF/RO requires significantly less power than treating seawater with high pressure RO, which means electricity costs are lower. However, advanced technology is required to treat municipal wastewater and remove bacteria and microscopic impurities. The TORAYFIL™ hollow fiber UF membrane is a key technology in this wastewater reuse process. This TORAYFIL™ UF membrane has high strength and high durability and so is resistant to fiber breakage, and it also offers easy maintenance because of its low



**Shinichi Minegishi, D. Eng.**  
General Manager, UF & MBR Membrane Products Department, Water Treatment & Environment Division, Toray Industries, Inc.



Pilot of Toray's UF membrane

Note: Water treatment using UF membrane is part of the process of wastewater reuse for drinking water.

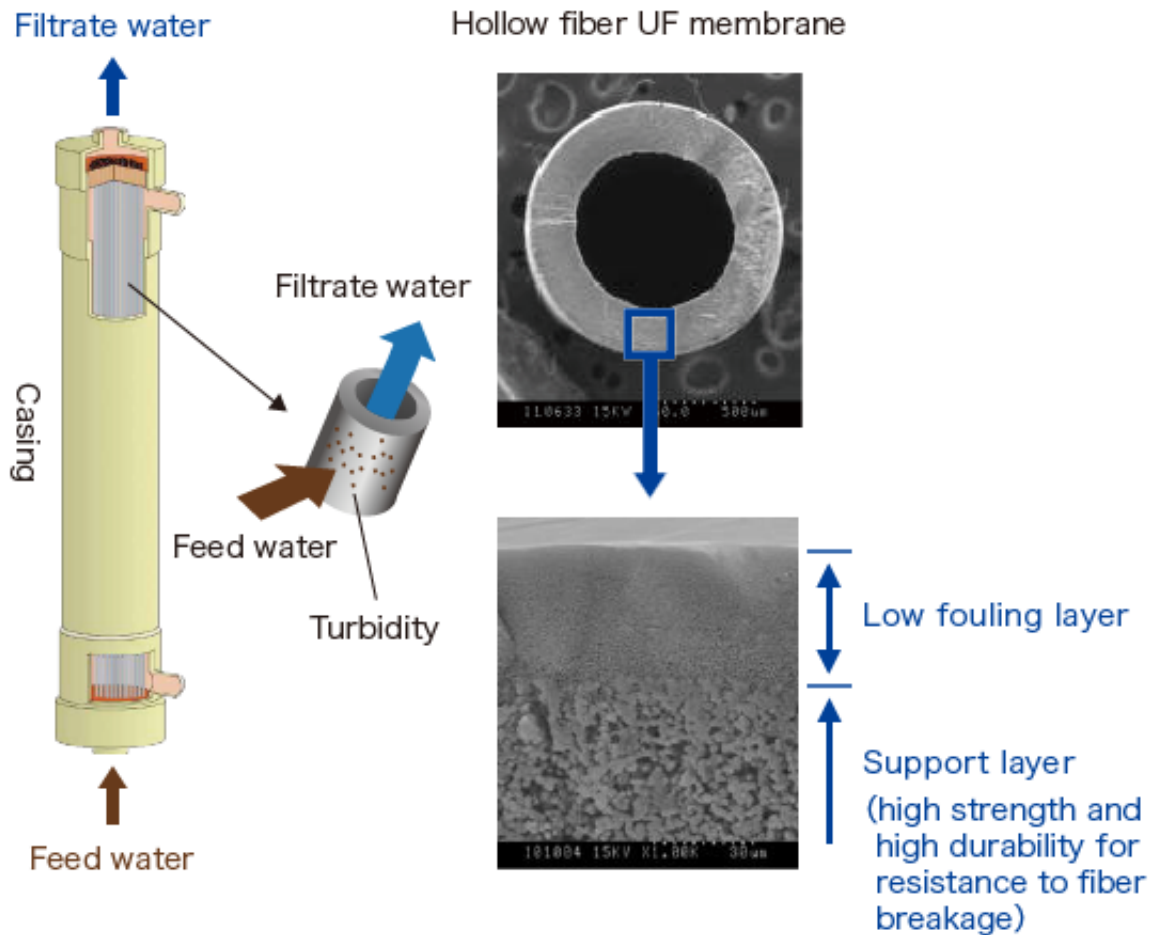


fouling and easy cleaning properties. Customers appreciate TORAYFIL™ because it delivers energy savings and long membrane life.

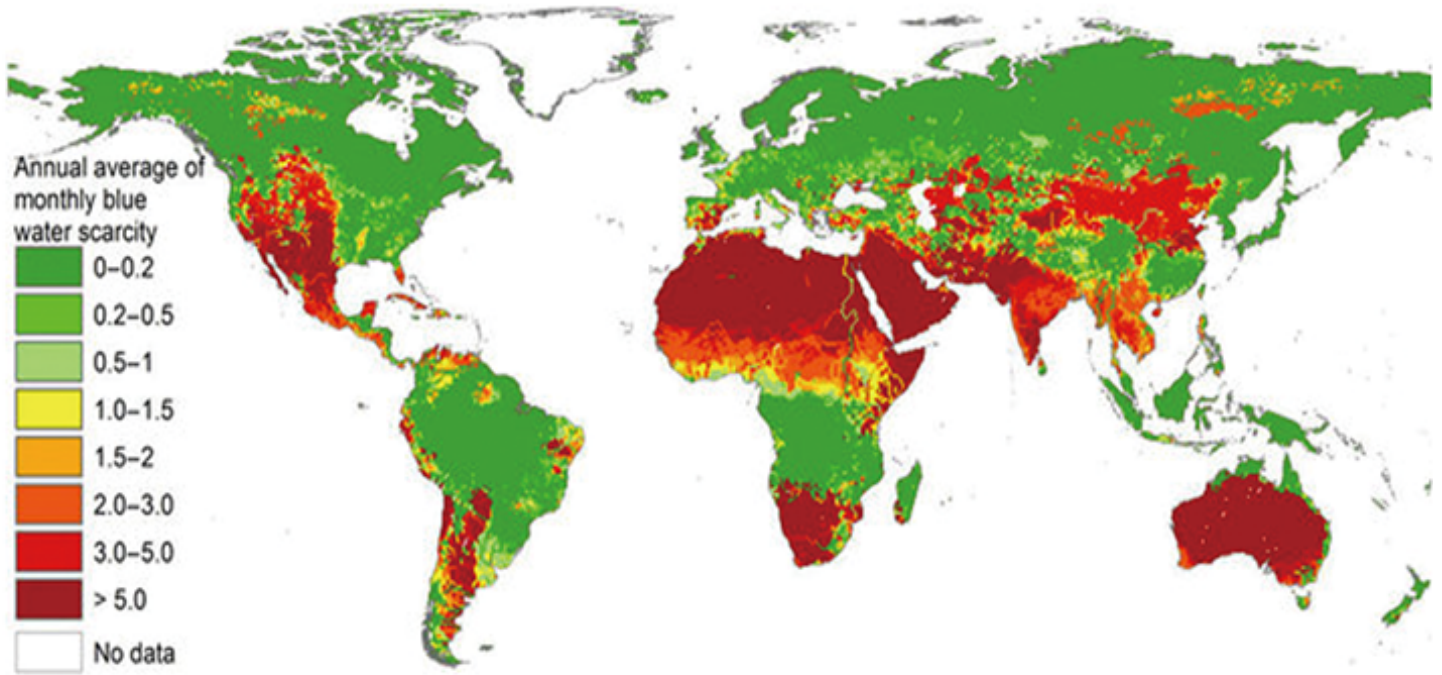
There are still few precedents for treating wastewater for direct use as drinking water. The Toray Group has originally developed all types of membranes used for seawater desalination and wastewater reuse, and it is working to move production, sales and research and development to local sites. The Toray Group will work hard to help solve water shortages while meeting the specific needs of each region, aiming to ensure the stable supply of the high-quality water the world needs.

1. This membrane has a pore diameter of about 0.01 micrometers and is used to remove turbidity and microorganisms.
2. This membrane has a pore diameter of about 0.001 micrometers and is used to remove ions and small molecules.

### Toray's hollow fiber UF membrane



## Global water shortages



Note: About two-thirds of the world's population faces water shortages lasting one month or more per year. (Source: Science Advances, February 15, 2016 edition)

## Fiscal 2017 CSR Highlights

### Green Innovation

# Better Clothing Insulation for a Lifestyle Less Dependent on Heating

## Fiber Materials That Take HEATTECH™<sup>1</sup> to the Next Level

The impact of climate change is not limited to warming global temperatures. Winter temperatures increasingly reach extremes, and life-threatening cold spells are occurring around the world.

Toray is addressing this situation by providing the material for HEATTECH™, a brand of thin but warm innerwear sold by UNIQLO Co., Ltd. Toray developed the special fabric for this product, which features fibers that absorb moisture and produce heat for a high thermal insulation effect. In the 15 years since it was first launched, over 1 billion HEATTECH™ garments have been sold around the world. It has entirely changed winter-wear for many people.

Working with UNIQLO, Toray hopes to create a lifestyle adapted to cold winters in which people all over the world wear HEATTECH™ and can naturally keep the heating settings low in their homes and at work. To this end, Toray has developed the optimal material for new items, such as Extra Warm and Ultra Warm for innerwear and HEATTECH™ home wear and HEATTECH™ Jeans. Toray has also updated the materials used in existing products every year to reflect customer feedback and new concepts based on customer needs.

Toray is also working on reducing the environmental impact of the product. The company uses techniques to make fibers even thinner and lighter and reduce material weight per product by optimizing the fabric width and cut when sewing the product. Going forward, Toray plans to develop processing technology that allows fabric to be dyed with less water as well as technologies for re-using the waste textiles generated when cutting the material.

Innovative materials can change people's clothing and make winter living more comfortable, which leads to energy conservation. Through the development of HEATTECH™, Toray will continue to propose ways to make life more comfortable.



**Satoshi Oki**

Strategic Materials Team Manager,  
Production Department, Product HQ  
UNIQLO Co., Ltd  
(Seconded from Toray Co., Ltd.)

1. HEATTECH™ is a registered trademark of Fast Retailing Co., Ltd.

Three types of HEATTECH™ with different warmth levels to match the wearer's needs



for everyday wear  
in winter

HEATTECH™



for particularly  
cold days

HEATTECH™  
Extra Warm



for extremely  
cold days

HEATTECH™  
Ultra Warm

Better heat retention

Normal  
HEATTECH™

Light and warm

About  
1.5 times

Extra Warm

Brushed fabric on  
the back makes it  
about 1.5 times  
warmer than regular  
HEATTECH™

About  
1.5 times

Ultra Warm

Ultra Warm is the  
warmest product in  
the history of  
HEATTECH™, with its  
thicker fabric and  
raised lining; it is  
about 2.25 times  
warmer than regular  
HEATTECH™.

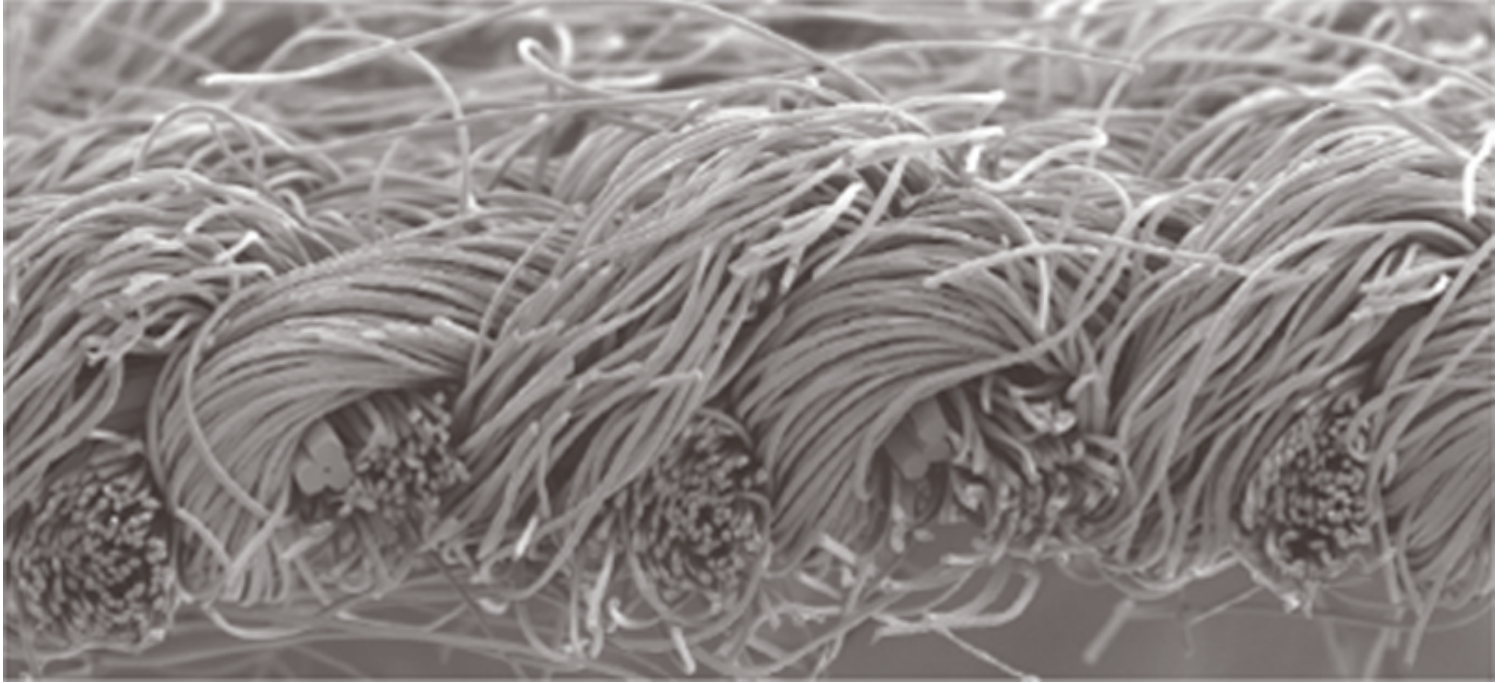
About 2.25 times

## Four Fibers Included in HEATTECH™

Toray knits together four fibers in a complex structure to make the most of the distinct properties of each type of fiber.

### Basic characteristics of the four fibers

- Rayon fiber → Generates heat by absorbing moisture
- Acrylic fiber → Creates pockets of air for impressive heat retention
- Spandex fiber → Excellent stretch and high elasticity
- Polyester fiber → Quickly wicks moisture and dries fast



## Fiscal 2017 CSR Highlights

### Life Innovation

# Improving Quality of Life for People in Asia

## Polypropylene (PP) Spunbond Nonwoven Fabrics<sup>1</sup> for High-Quality Hygiene Products

As economies develop in Asia and the standard of living improves, disposable diapers for infants are becoming more popular. Moreover, demand for adult diapers is growing in countries and regions with aging populations. Diapers used to be made of paper and cotton, but as performance has improved since the 1980s, the majority of diapers are now made of nonwoven fabrics of synthetic fiber, which feels softer and smoother on the skin than paper.

The Toray Group was one of the first to open manufacturing centers for PP spunbond nonwoven fabrics in South Korea, China and Indonesia to meet the need for local production by diaper manufacturers. Toray plans to open a new manufacturing center in India in 2020.

Toray's PP spunbond nonwoven fabrics are used for the topsheet inside the diaper and the side gathers that prevent leaks, so high quality such as a soft feel on the skin is critical. For adult diapers, a thinness and design similar to underwear, resistance to rashes, and ease of movement are particularly important. Toray aims to develop materials that can be used in a revolutionary diaper that makes the most of Toray's strengths in textiles, not just the polymers and fibers that serve as the raw materials.

Making diaper care easier can directly help to reduce the burdens of childcare and elderly care, as well as improve quality of life (QOL). Ever seeking to improve, in October 2017, Toray introduced a new piece of development equipment in the Shiga Plant, looking to upgrade both materials and processing technology. The Toray Group is determined to leverage its comprehensive strengths in synthetic fiber and work closely with diaper manufacturers, to develop and propose more comfortable materials and products for users.

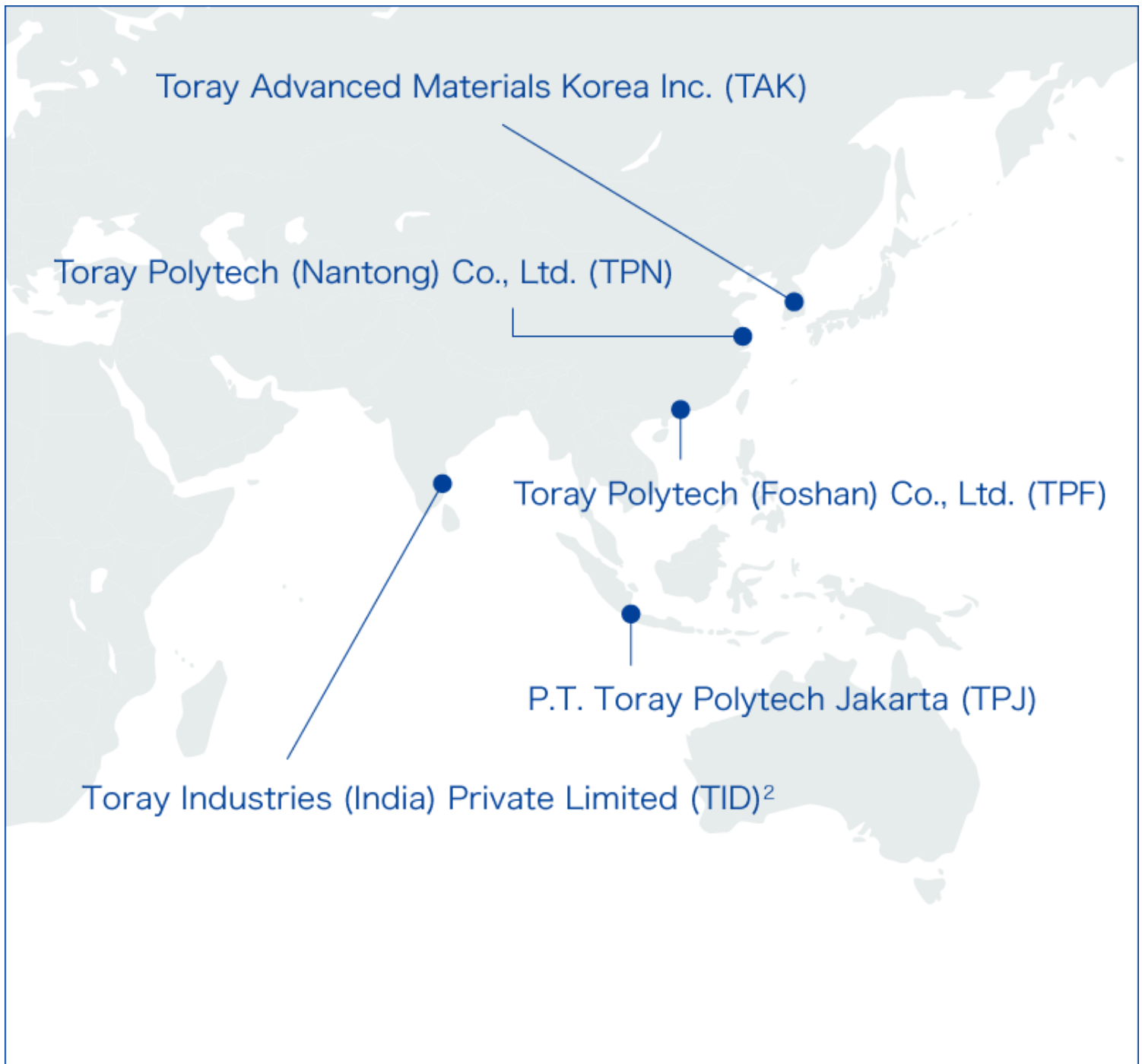


**Eri Takahashi**

Nonwoven Fabrics Technical Section,  
Nonwoven Fabrics Technical Department,  
Manufacturing Division, Toray Industries,  
Inc.

1. Filament yarn nonwoven fabric; spunbond is a kind of manufacturing method whereby Toray carries out everything from the fiber spinning to the nonwoven processing as a single process.

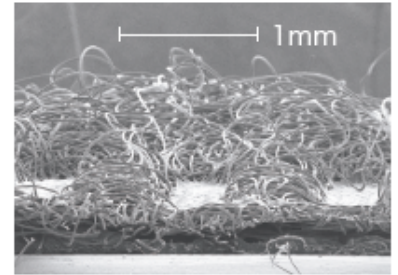
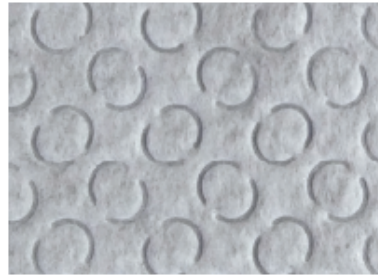
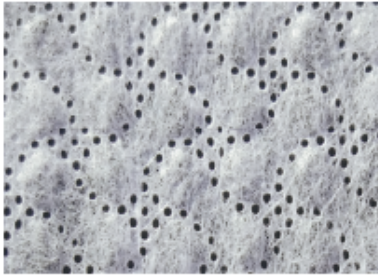
Toray Group's PP Spunbond Production Facilities Outside Japan



2. Scheduled to start production in 2020.

Topsheet and/or backsheet

Backsheet



Side gather





## Fiscal 2017 CSR Highlights

Life Innovation

# Reducing the Burden on Patients

## A Treatment Choice for Paroxysmal Atrial Fibrillation SATAKE-HotBalloon™ Catheter

Atrial fibrillation (“Afib”), a type of cardiac arrhythmia, is on the rise in Japan’s aging population. Estimates predict the number of people diagnosed will exceed one million in 2030. It is difficult to detect Afib during routine medical checkups and in some cases patients exhibit no subjective symptoms. However, Afib can lead to heart failure and stroke due to clot formation.

Antiarrhythmic drugs are used to treat the symptoms of Afib, but they are not effective in all patients. Catheter ablation (cardiac ablation) was developed to treat the underlying causes of Afib. This treatment involves passing a very thin tube (catheter) into the left atrium to directly ablate myocardial tissue using heat or cold applied with the catheter tip.

The Toray Group and Dr. Shutaro Satake, a leader in the treatment of atrial fibrillation, co-developed the SATAKE-HotBalloon™ System, to treat this disorder. This is the world’s first application of high radio frequency heat in a balloon ablation system. Made of polyurethane, the balloon is soft and extremely versatile with an adjustable diameter, making for an easy fit regardless of the size or shape of the treatment area. In addition, Toray has patented its technology for maintaining uniform temperature in the balloon using internal fluid agitation.

In contrast to conventional ablation techniques, the SATAKE-HotBalloon™ Catheter enables ablation of the entire area with one inflation due to placement of the balloon surface, rather than only a tip or line, against the atrium. Moreover, treatment with the SATAKE-HotBalloon Catheter can reduce the procedure time so that even older patients may receive treatment with less difficulty.

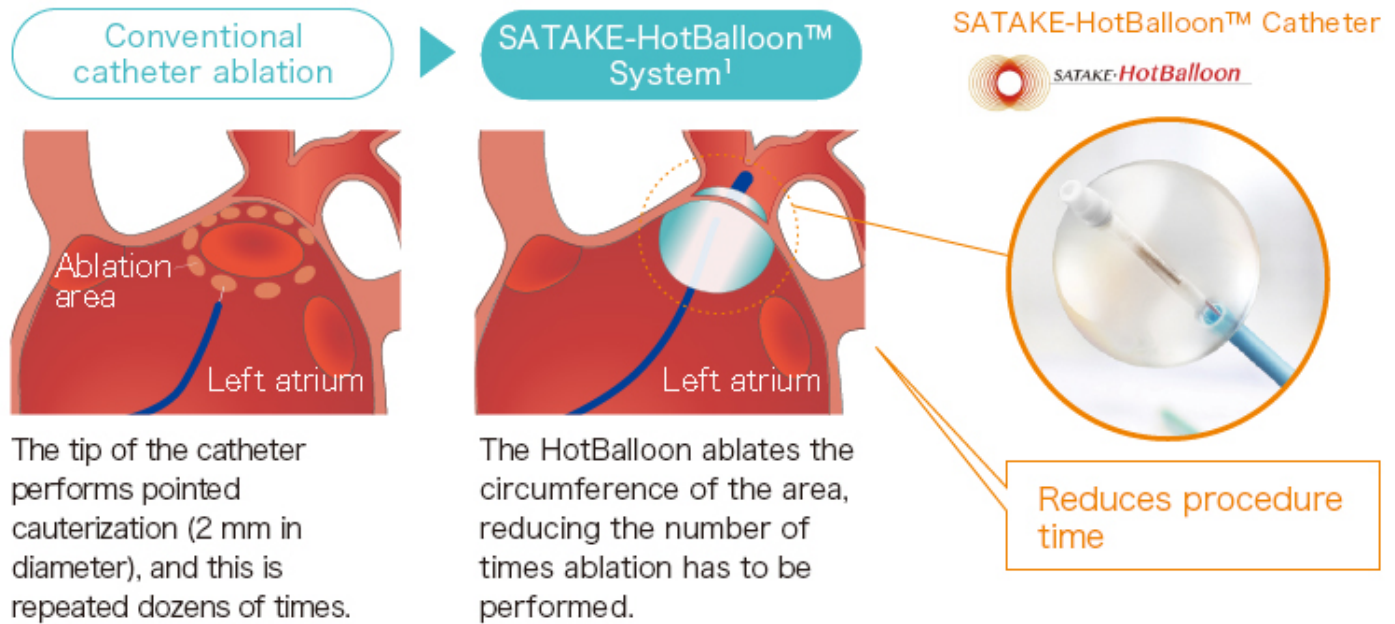
Toray aims to bring this system to market not only in Japan, but around the world. The Toray Group remains committed to contributing to health and longevity by working to develop technologies designed to treat the root of atrial fibrillation while also reducing the burden of procedures on patients.



**Tomohiro Baba**  
Hot Balloon Catheter Business  
Department, Toray Industries, Inc.

# What Is Atrial Fibrillation?

A normal heart beats at a rate of around 60 to 100 beats per minute. With atrial fibrillation, the heartbeat in the atrium becomes abnormally fast at more than 350 beats per minute, and the risk of heart failure and stroke increases. Catheter ablation and antiarrhythmic drugs are treatment options for Afib. The SATAKE-HotBalloon™ Catheter is used for targeted ablation of the left atrium at a temperature of about 65°C.



1. Toray's system for treating paroxysmal atrial fibrillation comprises three medical devices: (1) SATAKE-HotBalloon™ Catheter (high-frequency balloon catheter); (2) SATAKE-HotBalloon™ Generator (specialized high-frequency RF generator); and (3) Treswartz™ catheter insertion guiding sheath.

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Product name:SATAKE-HotBalloon™ Catheter

Japanese Medical Device Nomenclature (JMDN):Catheter for cardiac ablation

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Fiscal 2017 CSR Highlights

# Social Contribution through Science and Technology

## Developing New Talent for a Sustainable World



An employee teaches at an elementary school science classes on the theme of “Thinking about water filtration and the global environment.”



Toray offers high school students firsthand research experience at Toray’s Global Environment Research Laboratories in Shiga Prefecture



After a science class at a school conducted by Thai Toray Synthetics Co., Ltd.



Kazushi Hashimoto (center in photo), then-executive vice president of Toray Industries, at the 24th presentation ceremony of the Indonesia Toray Science Foundation

## Social Contribution Activities

The Toray Group works to contribute to society through its businesses, with its Corporate Missions including “For society: To establish ties and develop mutual trust as a responsible corporate citizen.” As the foundation of its business activities, the Group works to contribute to social development by building relationships of trust with local communities and the broader society.

In fiscal 2017, the Toray Group set priority areas for its social contribution activities: science and technology promotion, environment and communities, and health and welfare. In the area of science and technology promotion, the Group provides financial assistance to young researchers through Toray science foundations. The Group also conducts workshops at elementary and junior high schools to raise children's interest in science.

### Toray Group Workshops / Teaching Material Supply Programs

Topic	Program name	Target	No. of hours
Science experiment	Thinking about water filtration and the global environment	Fifth-year elementary school students	2 hours
	Learning about particles in water	First-year junior high school students	1 hour
Environmental education	Water treatment membrane and global environmental issues	Six-year elementary school students	1 hour
	Advanced materials and global environmental issues : Materials can change our lives	Third-year junior high school students	1 hour

Note: In science experiment programs, the Toray Group supplies schools with lab materials, as well.

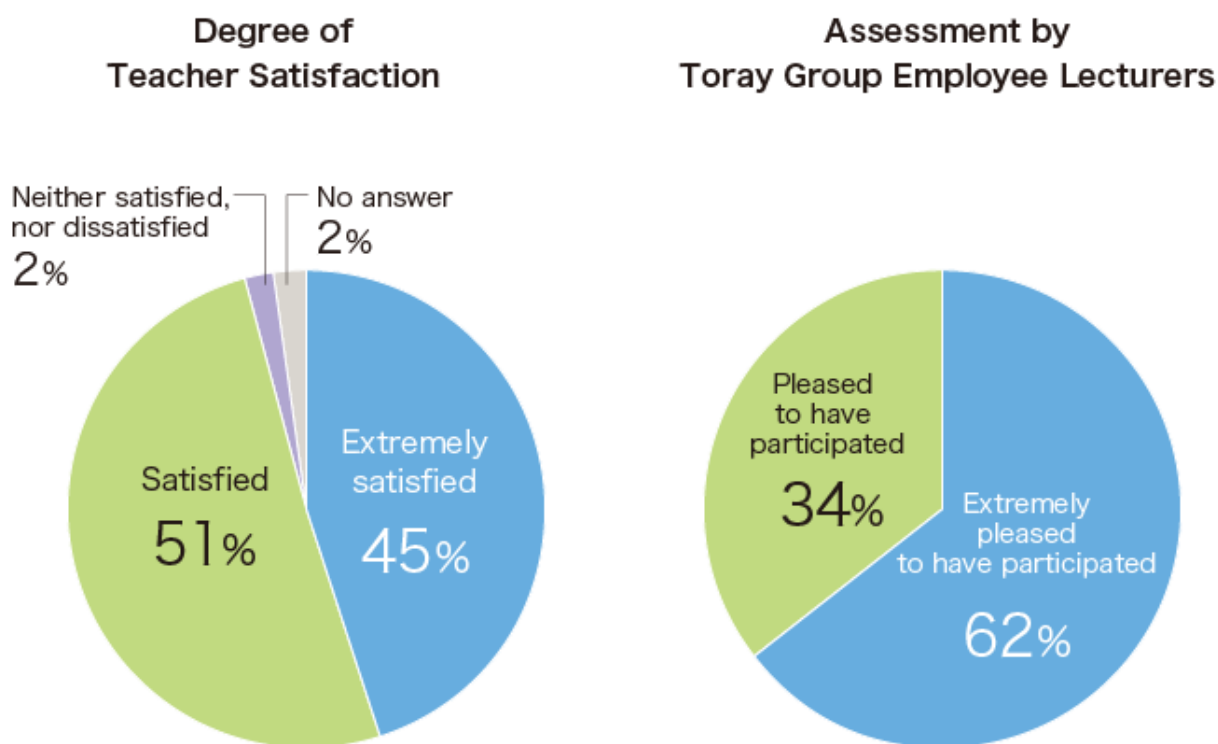
## Support for Science Education in Schools

In Japan, children's interest in science has been on the decline. To address the issue, in 2007, Toray developed a science workshop program using its products and designed for elementary school students to encourage their interest in science from an early age. The Group followed up by adding science workshop programs for junior high school students and workshops that focus on environmental education, and it currently implements four types of programs. Employees with a variety of expertise conduct these workshops at elementary and junior high schools. The Group also donates lab materials to schools, where they are used in teacher training courses at universities and other settings. In recent years, Toray has expanded these contributions, collaborating on offering teachers training and firsthand opportunities to familiarize themselves with advanced materials and technologies.

Employees involved in these educational programs report greater job satisfaction and motivation, which has been a driving force for continuing Toray's educational support activities.

The number of schools taking part in the programs has also expanded, with a particular increase seen in the number of applications when the program was opened to all schools in fiscal 2016.

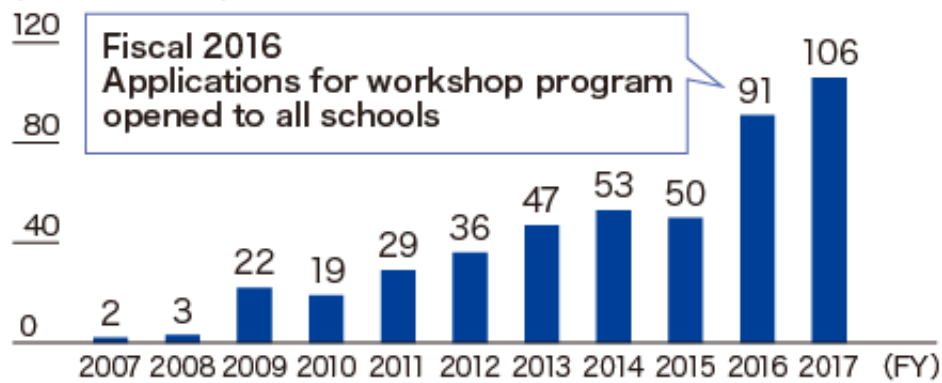
### Assessment of Workshops (Survey Results)



Note: Survey conducted by Toray in fiscal 2017. Five-point scale.

## Workshops / Teaching Material Supply Programs at Schools

(No. of schools)



## Global Expansion of Science Education

Building on activities in Japan, Toray Composite Materials America, Inc. (CMA) and Thai Toray Synthetics Co., Ltd. (TTS) introduced science workshop programs in 2012 and 2015, respectively. By modifying teaching materials for each workshop, the companies contributed to their communities and built friendly relations with the local people.

Between 2012 and 2017, more than 1,500 students participated in the CMA programs, and as awareness of the programs among local schools rises, requests to participate are also increasing.

“Before I joined CMA at the end of 2017, I was very impressed to hear from my son that CMA conducted a science workshop at his junior high school. I hope we will continue to implement these activities.” – Joyce Moore (at left in photo), Human Resources Department



“We believe that having employees from various departments interact with children in the classroom and having students learn about CMA’s technological innovations are extremely valuable for the Toray Group. Our employees enjoy it, and I am very proud of these

## Toray Science Foundations Around the World

The Toyo Rayon Science Foundation (now called the Toray Science Foundation) was established in 1960 to commemorate the 35th anniversary of Toray's founding. Toray contributed 1 billion yen when it was established, and has continued to donate funds to cover operating costs through the present.

The Foundation was much talked about when it was first established as a pioneering corporate foundation. Its support activities such as grants and prizes in the basic science field have continued to win high praise. Five of the recipients of the Foundation's Science and Technology Prizes or Science and Technology Grants have gone on to win Nobel Prizes. In addition, the Foundation also honors science teachers who produce creative and innovative lessons and teaching materials with positive results in junior and senior high schools and promotes the prize-winning lessons.

In 1993 and 1994, Toray established science foundations in Malaysia, Indonesia and Thailand. These foundations present awards and grants to researchers and secondary education science teachers. In January 2018, Toray's newest science foundation was established in the Republic of Korea.

Toray is committed to continuing to contribute to the promotion of science and technology both in and outside of Japan.

### Website

Toray Science Foundations around the World

[https://www.toray.com/csr/activity/contribution/science\\_foundation.html](https://www.toray.com/csr/activity/contribution/science_foundation.html) 

## Contributing Solutions to Social Issues through Business Activities

Leverage innovation to address global-scale environmental issues such as climate change and provide solutions for various social issues such as the need to improve the quality of medical care, the need to reduce the burden on medical staff, and health maintenance and longevity, thereby helping to build a more sustainable world.

## Policy and Framework

### Sixth CSR Road Map Goal

1. Help address social issues by developing innovative materials and new technologies, focusing on the fields of Green Innovation and Life Innovation

## Management

Under the medium-term management program, Project AP-G 2016, the Toray Group implemented the Green Innovation Business Expansion Project and the Life Innovation Business Expansion Project to expand business in growth sectors. The Group is continuing to implement these group-wide projects, which are overseen directly by the president, under the new medium-term management program, Project AP-G 2019, which was launched in fiscal 2017.



## Contributing Solutions to Social Issues through Business Activities

# Green Innovation Business Expansion Project

### Sales of Green Innovation products

Reporting scope : Toray Group

Fiscal 2017 target:

No annual numerical target



**Result:**

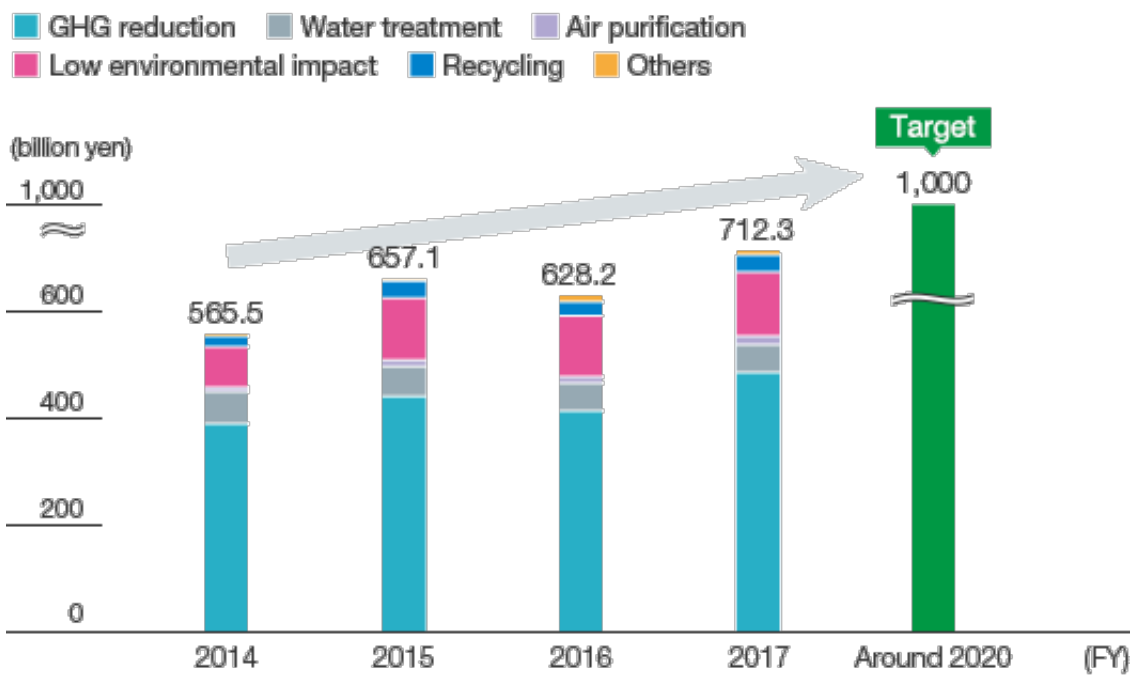
**712.3 billion yen**

The Toray Group embraces a management policy mandating that all business strategies must prioritize responsibility for the global environment in an effort to help build a more sustainable world with a small carbon footprint. The Group is endeavoring to realize this vision by addressing global environmental, resource, and energy issues through the continued implementation of the Green Innovation Business Expansion Project.

Sales in Green Innovation businesses have steadily increased since the start in 2011, reaching consolidated net sales of 712.3 billion yen in fiscal 2017. In the medium-term management program, Project AP-G 2019, which started in fiscal 2017, the Toray Group set a challenging target of 900 billion yen in net sales from Green Innovation businesses on a consolidated basis and aims to expand its environment-related businesses. CO<sub>2</sub> emissions avoided by using Toray Group products have been steadily increasing with the expansion of the business, reaching 131 million tons-CO<sub>2</sub> in fiscal 2017.<sup>1</sup>

1. For CO<sub>2</sub> emissions avoided in the supply chain, Toray calculates the CO<sub>2</sub> emissions reduced throughout the value chain of products in accordance with the chemical sector guidelines of the Japan Chemical Industry Association, the International Council of Chemical Associations (ICCA), and the World Business Council For Sustainable Development (WBCSD).

Sales of Green Innovation Businesses (Toray Group) (Billion Yen, Consolidated)



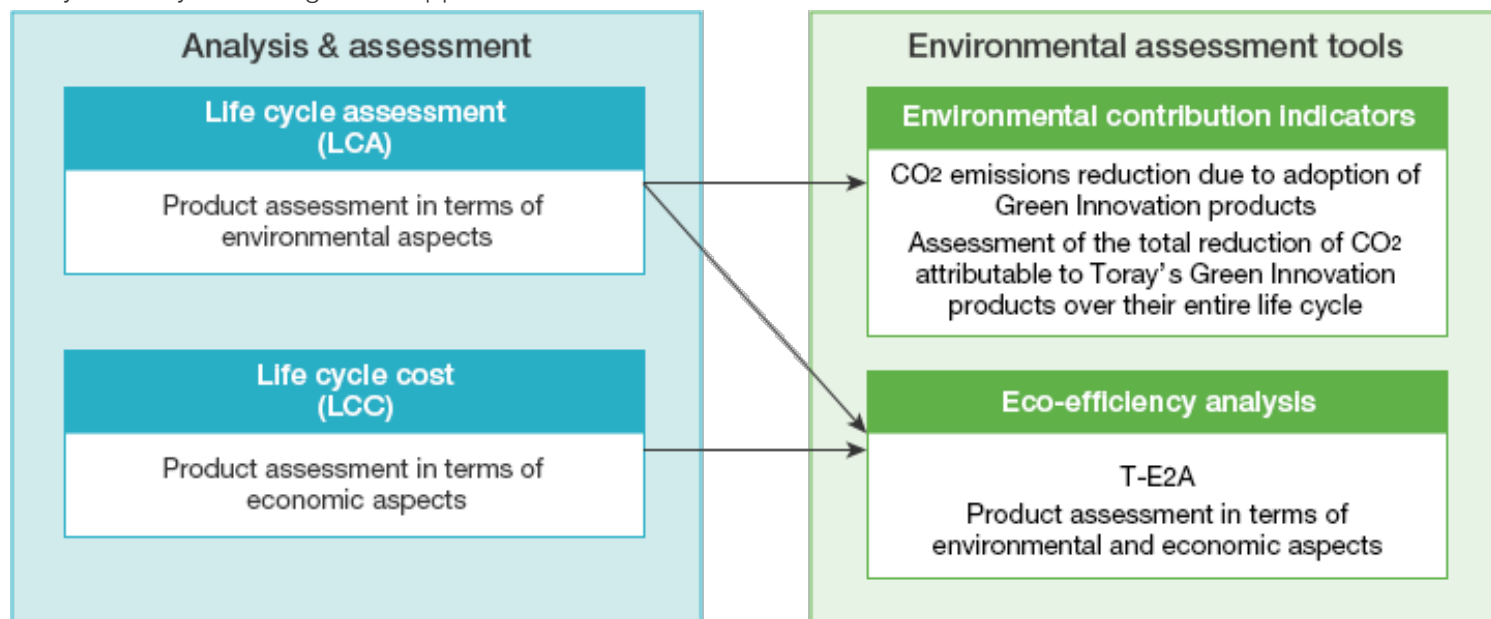
## Contributing Solutions to Social Issues through Business Activities

# Promoting Life Cycle Management

In addressing global environmental issues, it is vital to consider the entire life cycle of products and services in order to reduce environmental impact while also delivering improved economic and social value. To this end, the Toray Group practices life cycle management. Life cycle management is the basis for Toray's Green Innovation products, and the Group has adopted life cycle assessment<sup>1</sup> and the Toray Eco-Efficiency Analysis (T-E2A)<sup>2</sup> tool and is working to ensure these are employed thoroughly in all of its businesses.

1. Life cycle assessment is a method for quantitatively assessing the resources that have gone into a product and the impact the product will have on the environment and ecosystems over its life cycle.
2. T-E2A is an environmental analysis tool developed by Toray. It produces a map of multiple products plotted along the axes of environmental impact and economic performance, enabling users to select the most environmentally friendly and economical products.

Toray's Life Cycle Management Approach

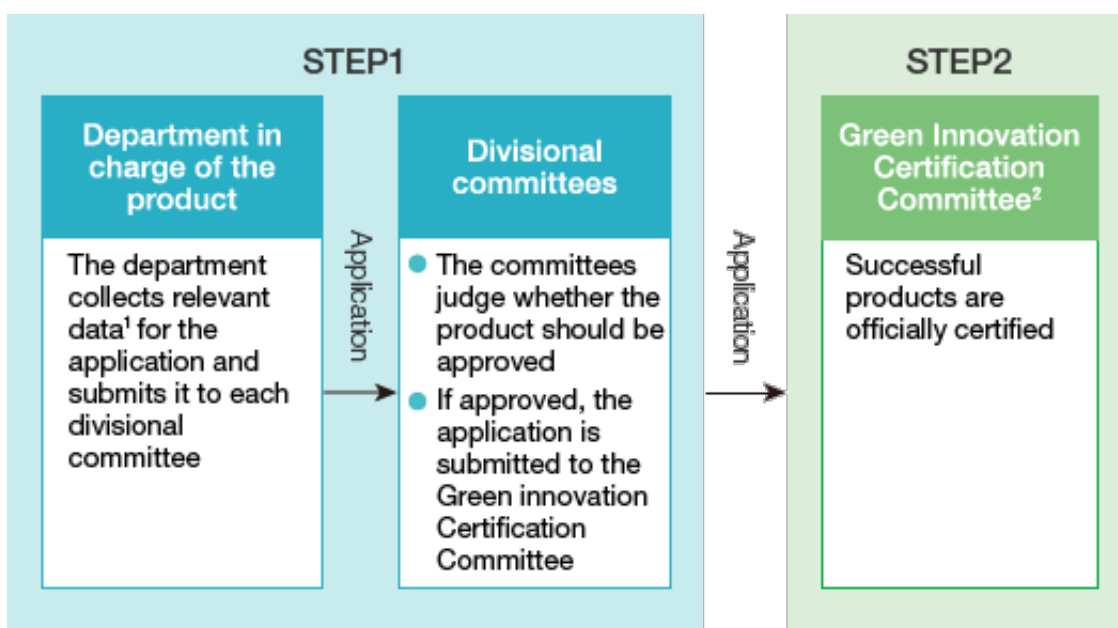


**Contributing Solutions to Social Issues through Business Activities**

## Approach to Green Innovation Products

The following diagram outlines the Toray Group's process and procedures for certifying Green Innovation products. Products are subjected to a two-stage screening process conducted by the divisional committees and by the group-wide Green Innovation Certification Committee. Those able to demonstrate objective evidence of providing an effective solution for global environmental issues are certified as Green Innovation products.

Green Innovation Product Certification Process



1. This includes LCA data, T-E2A data, and estimates of CO<sub>2</sub> emissions reduction attributable to the product.
2. Comprised of members of Toray's Global Environment Business Strategic Planning Department, Marketing Planning Department, and Technology Center Planning Department, as well as experts when necessary.

### Fiscal 2017 Highlights

## Toray Begins Developing Waterless Offset Printing System for Flexible Packaging to Eliminate VOC<sup>3</sup> and Reduce CO<sub>2</sub> Emissions

VOC emissions have become a social issue as a cause of environmental pollution by PM<sub>2.5</sub>, especially in China and emerging countries in Asia. As the regulations governing VOC emissions tighten around the world, and with China beginning to implement a system of charging the printing industry for VOC emissions, the need for a printing method that does not emit VOCs is increasing.

In fiscal 2016, Toray developed a waterless UV offset printing system using water soluble-inks, which eliminates the use of organic solvents that are the source of VOC emissions in printing, ink and washing after printing. In response, in August 2017 Toray began developing a waterless offset printing system for flexible packaging, which eliminates VOCs and enables significant reductions in CO<sub>2</sub> emissions in the printing process.

Flexible packaging uses flexible film materials and is employed for packing a wide range of products such as foodstuff, snacks and refills of shampoo and detergent. The newly developed waterless offset printing system for flexible packaging can reduce VOC emissions to less than one-fiftieth of VOC emissions in the gravure method widely used for flexible packaging printing in Asia. Combining ink drying method employing energy-saving LED-UV technology eliminates the need for the drying solvents and exhaust gas processing required with the gravure method and cuts electricity consumption by more than one-sixth. It also significantly cuts CO<sub>2</sub> emissions generated in electricity use. The waterless offset printing system for flexible packaging is being developed by Toray, in collaboration with ink manufacturers, printing machine manufacturers and printing companies, with a grant from the Program for Strategic Innovative Energy Saving Technology of Japan's New Energy and Industrial Technology Development Organization. Toray will accelerate market development with the aim of reducing about 500,000 tons of CO<sub>2</sub> per year<sup>4</sup> in Japan by around 2030.

3. Volatile organic compounds. Once released into the air, they cause pollution and other health hazards. They are also the source of PM2.5, fine particulate matter that affects health when it settles in people's respiratory systems.
4. Toray estimates and projected values.

## **ecodear™ PET Supplied for World's First Work Gloves Complying with Japan's Act on Promoting Green Purchasing<sup>5</sup>**

The Basic Policy on the Act on Promoting Green Procurement, which encourages the purchase of environment-conscious products, was passed in February 2017 by Cabinet decision, and the new criteria were established for plant-based synthetic fibers in the field of work glove products. Toray supplies its ecodear™ PET, a partially plant-based polyester fiber, for Plantex Gloves, a work glove that became the first product in the world to comply with these new criteria. Plantex Gloves are products of Midori Anzen Co., Ltd. and the partially plant-based polyester fiber ecodear™ PET accounts for over 80% of the product by weight.<sup>6</sup> The ecodear™ PET contains approximately 30% plant-derived content made using ethylene glycol from sugarcane-derived waste molasses.



Plantex Gloves

The Plantex Gloves were launched in June 2017 in conjunction with the start of the application of the new criteria under the law. They are expected to be used in many applications, including light work and machinery operation.

5. The Act on Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities, which is the law's official name, went into force in April 2001, and mandated green procurement for government and other organizations, while also encouraging local public bodies, businesses and citizens to buy green.
6. Excluding the part with slip-resistance coating

# **Type I Environmental Label<sup>7</sup> (Eco Mark) Certification for ecodear<sup>TM</sup> PTT Textile Products<sup>8</sup> Made Using DuPont<sup>TM</sup> Sorona<sup>®</sup>, a Partially Plant-Based Polymer—World’s First Type I Environmental Label Certification for PTT Textile Products**

In October 2017, partially plant-derived ecodear<sup>TM</sup> PTT composite fiber (filament yarn) and textiles obtained the Eco Mark Product Category No. 104 Household Textile Products certification. This is the first time in the world for PTT textile products to obtain the Type I environmental certification (Eco Mark in Japan).

ecodear<sup>TM</sup> PTT textile products use DuPont<sup>TM</sup> Sorona<sup>®</sup> polymer, a partially plant-based poly trimethylene terephthalate (PTT) resin that is about 37% plant-derived and is produced by DowDupont Specialty Products Division and supplied by DuPont Specialty Products Limited.

Using renewable materials helps to reduce the emission of greenhouse gases. With ecodear<sup>TM</sup> PTT being certified as a Type I environmental label product, Toray will strengthen the deployment of the PRIMEFLEX<sup>TM</sup>,<sup>8</sup> brand as a material that combines textile performance and reliable environmental performance.

7. This is an environmental label by a third-party certification, reflecting the intention of environmental administration in various countries and regions around the world. Eco Mark, administered by the Japan Environment Association (JEA) is Japan’s only Type I environmental label.
8. ecodear<sup>TM</sup> and PRIMEFLEX<sup>TM</sup> are registered trademarks of Toray Industries, Inc.
9. DuPont<sup>TM</sup> Sorona<sup>®</sup> is a registered trademark of E. I. du Pont de Nemours and Company.

## Contributing Solutions to Social Issues through Business Activities

# Promoting Recycling Initiatives

As a manufacturer of a wide range of materials, the Toray Group is promoting various recycling initiatives that ensure that the earth's resources are efficiently utilized.

### Recycling Activity Principles Adopted in March 2004

1. We shall design, produce, and sell products that reduce our impact on the environment.
2. We shall purchase and use materials and products which will help reduce our impact on the environment.
3. We shall disclose information related to recycling programs and recycled goods.
4. We shall voluntarily cooperate with customers to recycle or otherwise appropriately dispose of our products.

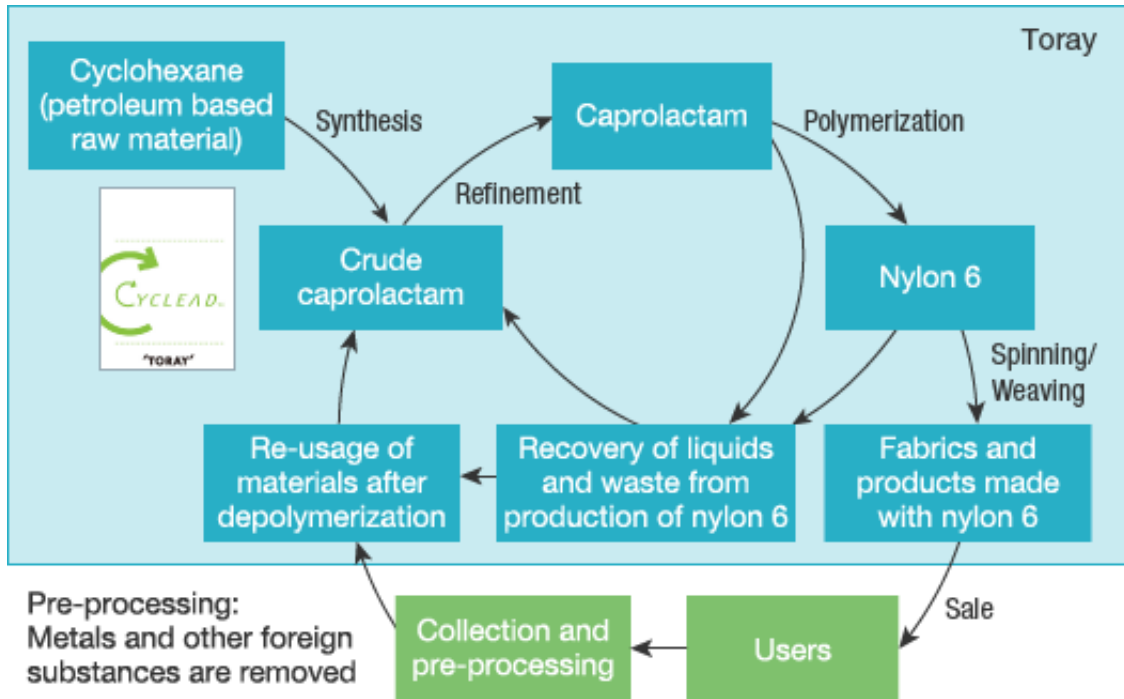
## Fiber and Textile Recycling

Toray has two brands in the fiber and textile recycling field. CYCLEAD™ is a system for collection and circulation type recycling which is used for recycling nylon 6 fibers, etc. Ecouse™<sup>1</sup> is a regeneration type recycled polyester fabric made from recycled PET bottles, etc.

1. In fiscal 2015, Toray expanded the Ecouse™ brand to encompass non-fiber products, as an integrated brand name for recycled materials and products offered by Toray.

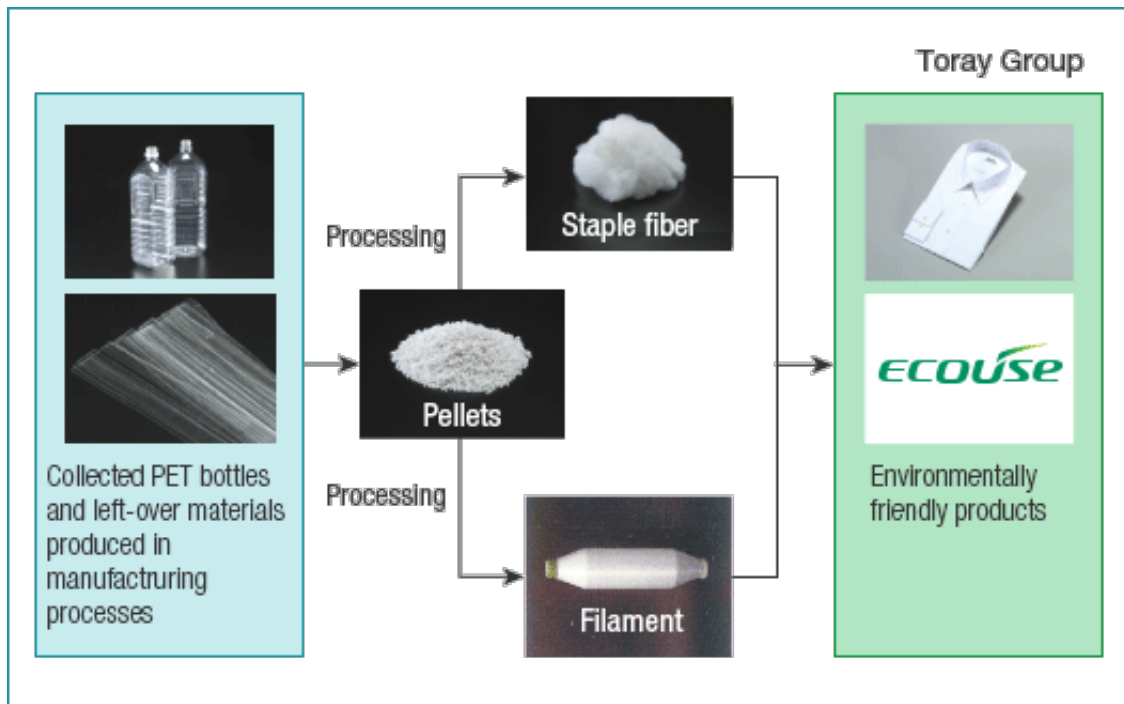
## Collection and Circulation Type Recycling with CYCLEAD™

Fabric made from recycled fibers recovered from disposed nylon and other products



## Regeneration Type Recycling with EcoUse™

Fabric made from recycled PET bottles for uniforms and functional sportswear



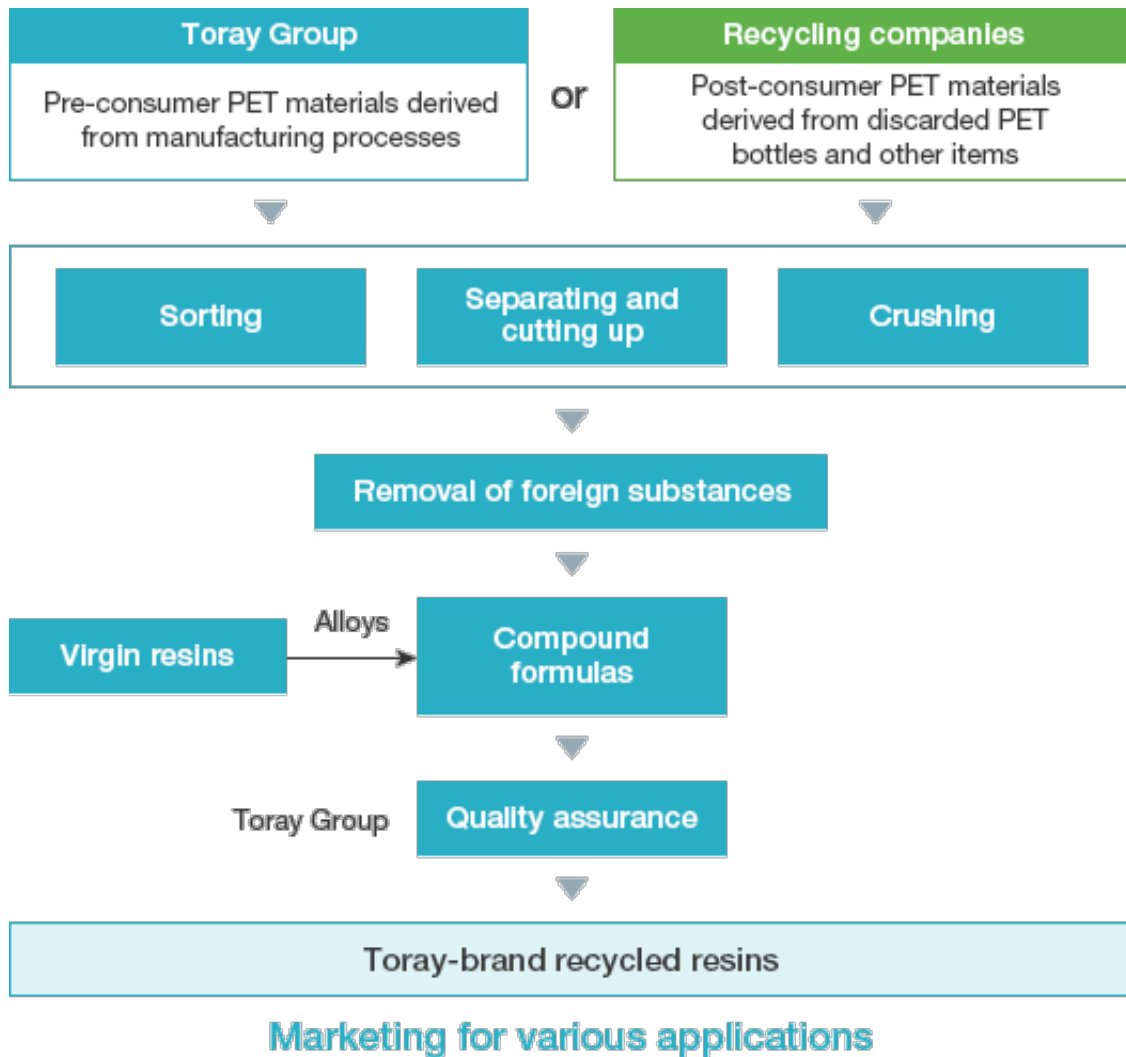


## Resin Recycling

The fans inside home air conditioners are designated for recycling under Japan's Act on Recycling of Specified Kinds of Home Appliances. While continuing to conduct closed-loop recycling (in which end-of-life products are recycled into the same product) of fans and other products, the Toray Group is also diversifying its procurement sources for fans to address growing market needs.

In addition, the Toray Group actively engages in pre-consumer recycling, by reusing byproducts from internal manufacturing processes such as film scraps and fiber scraps. Furthermore, the Group promotes post-consumer recycling using PET bottle scraps and computer plastic scraps, in order to comply with green procurement regulations in and outside Japan.

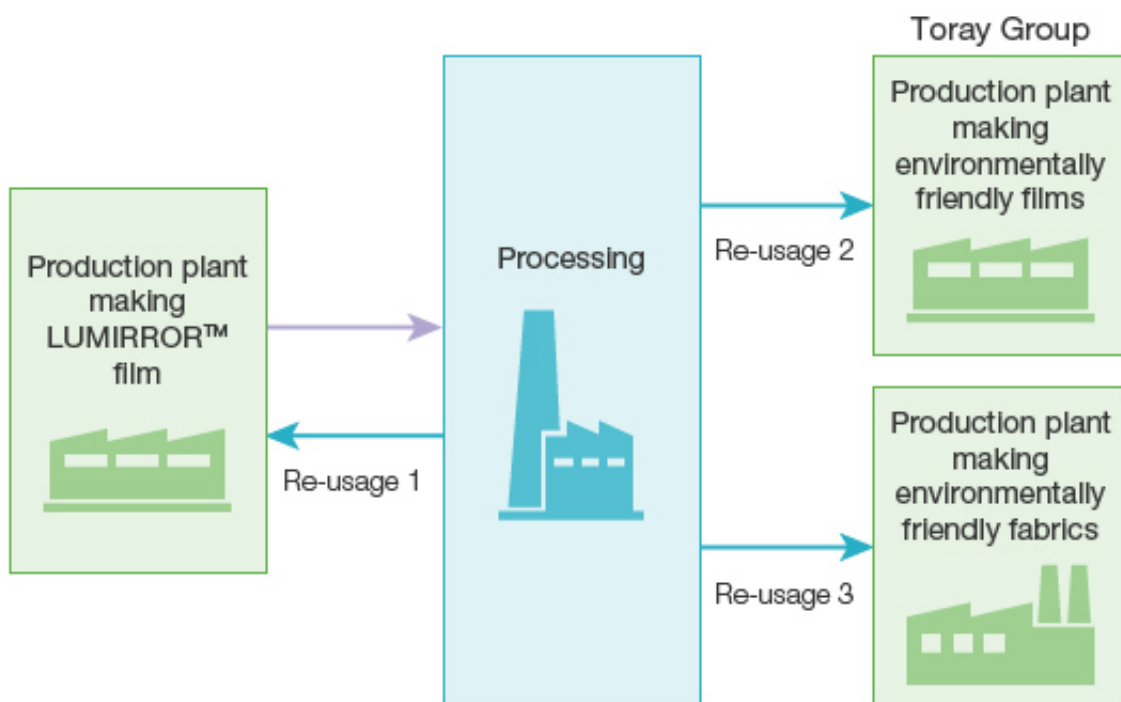
Pre-consumer/Post-consumer Recycling



## Film Recycling

Toray is recovering and processing raw materials used to make its LUMIRROR™ optical-use PET film and re-using them to produce environmentally friendly films and fabric products.

Processing and Re-using Recovered Raw Materials Generated from Manufacturing Processes



## Carbon Fiber Recycling

Carbon fiber is a lightweight material that significantly curbs CO<sub>2</sub> emissions over the entire lifecycle of the products in which it is used. It is viewed as an important tool for helping to solve global environmental issues. As a result, demand for carbon fiber is expanding across a wide range of applications, including aircraft and automobile parts. As demand grows, market expectations for the development of carbon fiber recycling technologies are also on the rise.

As a member of the Consortium for Carbon Fiber Recycling Technology Development (dissolved at the end of March 2015), Toray has taken steps to develop carbon fiber recycling technologies. The successful development of recycled carbon fiber and associated applications requires collaboration with a wide range of customers to explore various possibilities for use in specific parts and materials.

As part of this effort Toray collaborates with Toyota Tsusho Corporation in a program of the New Energy and Industrial Technology Development Organization (NEDO) for the development of a highly efficient recycled carbon fiber manufacturing technology that uses an innovative and energy-efficient thermal decomposition method.<sup>2</sup> This new technology uses combustible gas from matrix resin as the energy source for the thermal decomposition process, which is the process that consumes the most energy in this type of carbon fiber recycling. As a result, the companies have significantly reduced the amount of energy consumed in the recycling process.

With an eye towards future commercialization, Toray had constructed a pilot plant to test energy-efficient recycled carbon fiber manufacturing technologies, and began to operate it in July 2017. In addition, the Toray Group will promote the development of new applications for recycled carbon fiber.

2. Thermal decomposition method: A recycling method in which carbon fiber is recovered by heating carbon fiber composite materials and thermally decomposing the matrix resins.

## Contributing Solutions to Social Issues through Business Activities

# Life Innovation Business Expansion Project

### Sales of Life Innovation products

Reporting scope : Toray Group

Fiscal 2017 target:  
No annual numerical target



**Result:**  
**211.9 billion yen**

Today, with the global population at over seven billion and life expectancy rising and birth rates declining not only in developed countries, but also in emerging countries, the world faces issues related to a rapidly aging population. The entire international community must find ways to provide healthcare that helps patients lead healthy, independent lives and ways to deliver high-quality medical care that reduces the burden on both patients and medical staff.

Recognizing that innovation is essential to solving these social issues, Toray introduced its Life Innovation Business Expansion Project in fiscal 2014. This project aims to apply the Group's technologies and business platforms to addressing social issues in the medical and healthcare field. The Life Innovation business was developed to help improve the quality of medical care, reduce the burden on medical staff, and contribute to health maintenance and longevity. The Toray Group selects important products and services for Life Innovation and is developing these businesses group-wide.

### Product Definitions and Guidelines

## Improving the quality of medical care and reducing burden on medical staff

- Products used in medical treatment: Pharmaceuticals, therapeutic devices, materials/components related to preparation of therapeutic agents
- Products used in medical testing and diagnosis: Testing devices and diagnostic systems
- Supplies for hospitals: Functional, special-grade products
- Other: Analysis services, manufacturing equipment/facilities

## Contributing to health maintenance and longevity

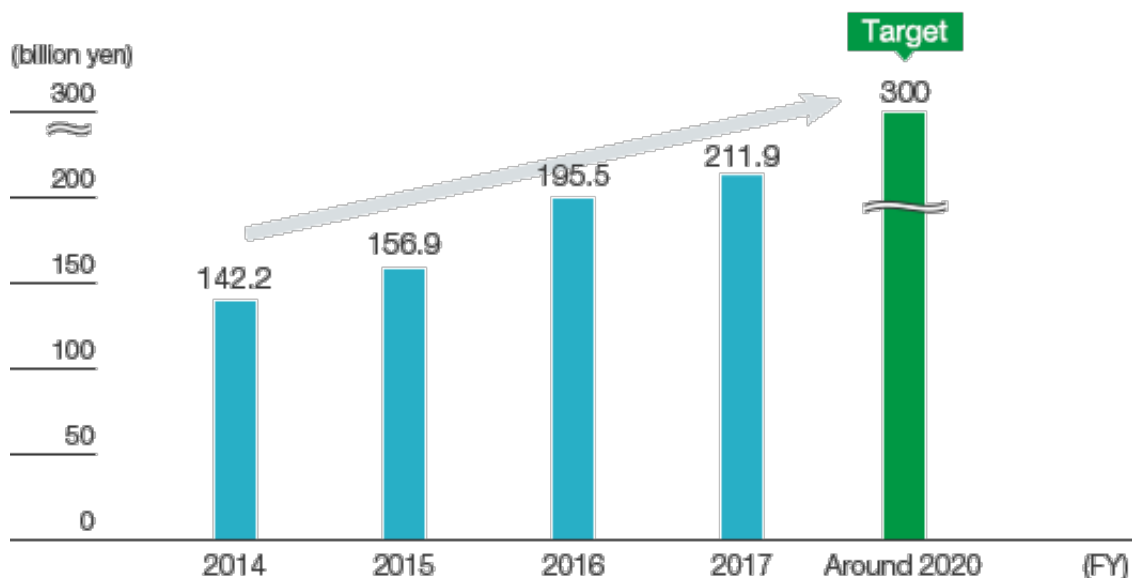
- Products that improve quality of life for the elderly, persons with disabilities, and patients
- Products that prevent diseases and disorders

- Nursing care products

Note: Includes materials and components used in the above products

In fiscal 2017, net sales from Life Innovation businesses were 211.9 billion yen, up from 142.2 billion yen in fiscal 2014. The Group has set a goal of generating 270 billion yen in net sales from Life Innovation businesses by fiscal 2019.

Sales of Life Innovation Businesses (Toray Group)



## Fiscal 2017 Highlights

### Toray Acquires Site in India to Expand Advanced Materials Business

In February 2018, Toray acquired an industrial-use plot of about 350,000 m<sup>2</sup> in Sri City, Andhra Pradesh, India, and will use it as the new base for its local subsidiary Toray Industries (India) Private Limited (TID). The new site will play a key role in the Toray Group's advanced materials business. Toray plans to invest aggressively at the site and use it as a global operational base with a focus on meeting domestic demand in India and capturing increasing demand in various business fields throughout South Asia.

As the first development at the site, Toray has decided to establish a new production facility for its polypropylene (PP) spun bond for hygiene materials business, a market which is expected to expand along with the increasing demand for disposable diapers. The new facility will have an annual production capacity of about 18,000 tons and is expected to come online in April 2020. Local production in the country where the products will be consumed will deliver high cost competitiveness and ensure that Toray can reliably meet the increasing demand for disposable diapers.

# Toray Begins Marketing LIVMOA™ Breathable Type Protective Clothing and Develops LIVMOA™ 3500 Series, which Adds Oil-Resistant Protection

Toray began marketing the LIVMOA™ 3000 series, a breathable type of LIVMOA™ limited-use protective clothing, in June 2017. This series, made of three layers of non-woven fabrics, keeps solid dust from adhering and prevents contamination by floating particles. It has excellent breathability, and helps to improve the work environment in sites that require dust resistance.

Toray also developed the LIVMOA™ 3500 series, which adds oil-resistant protection to the LIVMOA™ 3000 series, in October 2017. This product will help to improve comfort in work environments where employees come into frequent contact with oil and other contamination, such as the steel, auto and maintenance sectors.



LIVMOA™ 3500 series

# Corporate Governance and Management Transparency

Continually revise management systems, strengthen internal controls and strive for timely and appropriate information disclosure as part of efforts to fulfill the company's social responsibilities

## Policy and Framework

### Sixth CSR Road Map goals

1. Enhance management transparency, continually reflect stakeholder feedback in management, and fulfill responsibilities to explain corporate activities
2. Perform monitoring based on the Basic Policy for Internal Control Systems, in accordance with Japan's Companies Act
3. Expand CSR education throughout the Toray Group to facilitate CSR activities

## Management

From the outset, one of the Toray Group's managerial principles has been that the purpose of a company is to contribute to society. The Group has developed a Management Philosophy that incorporates this principle.

The Group's Management Philosophy is structured with the following components: the Corporate Philosophy, Corporate Missions, and Corporate Guiding Principles. The Corporate Missions specify the Group's commitment "To provide our shareholders with dependable and trustworthy management," and the Corporate Guiding Principles stipulate the Group's commitment to "Obtaining the trust of society and meeting the expectations by acting fairly while maintaining high ethical standards and a strong sense of responsibility and maintaining transparency in management."

In establishing its corporate governance structure, the Group seeks to fulfill these philosophies as its basic policy.

### Related Information

- > [Corporate Governance](#)
- > [Basic Policy on Corporate Governance](#)

## **Toray's Management Structure**

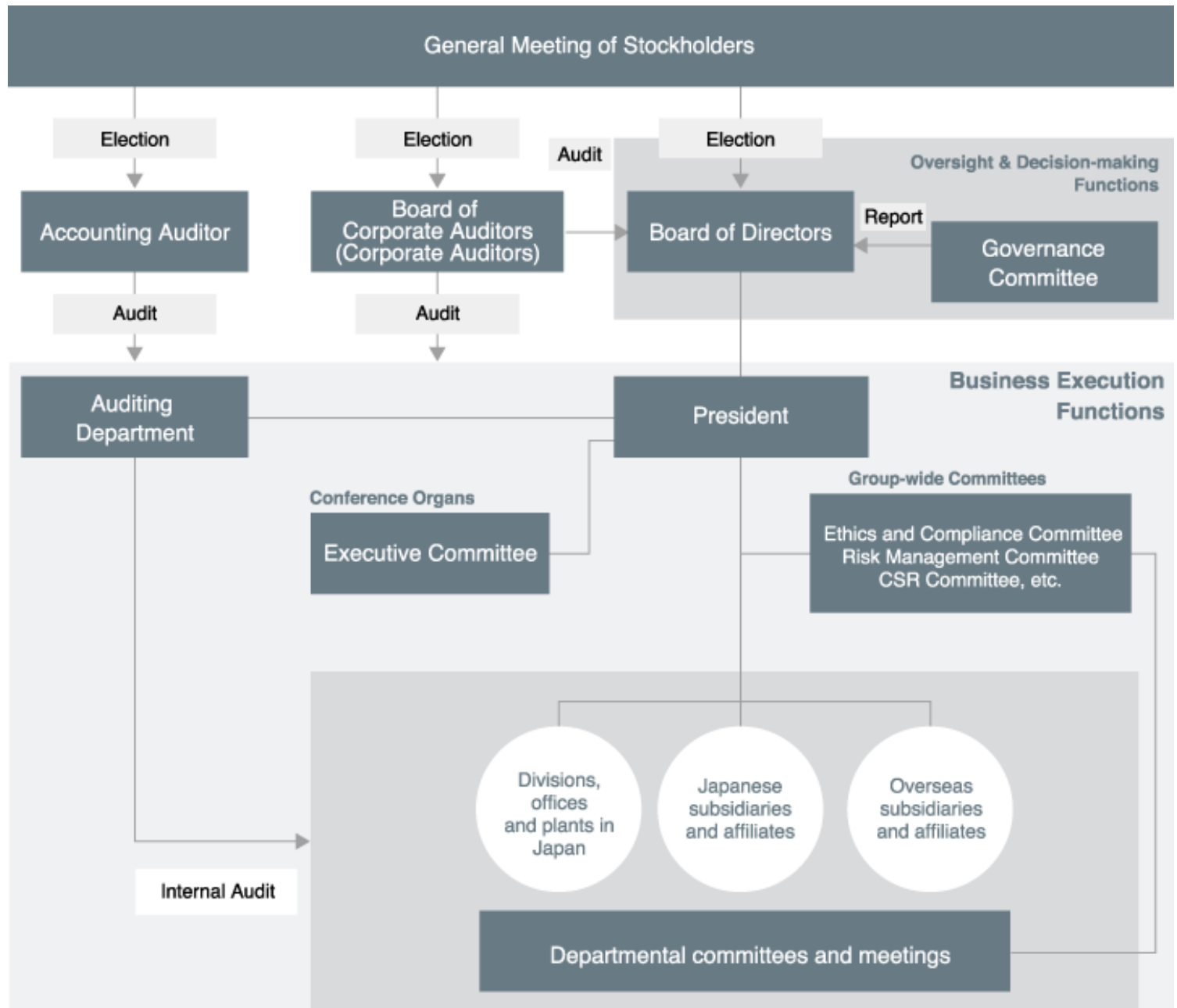
Toray's Board of Directors is made up of 19 members (two of whom are outside directors). The Toray Group operates in a broad spectrum of business fields at a global level. Business management and decision-making, as well as oversight, require expertise related to the day-to-day operations of Toray worksites. To that end, the composition of the Board of Directors is designed to ensure that members bring a diverse range of perspectives to management oversight and decision-making based on their expertise in the Group's businesses.

The Board of Corporate Auditors (four auditors, two of whom are outside corporate auditors) is entirely independent of the Board of Directors. Based on professional expertise in finance, accounting, and law, as well as an understanding of the Group's businesses, the Board of Corporate Auditors exercises oversight over directors' execution of their duties.

Toray established the Governance Committee as an advisory organ to the Board of Directors in order to report to the Board of Directors on important issues regarding Toray's corporate governance over the medium- to long-term, and it met three times in fiscal 2017. The Governance Committee consists of the chairman of the Board, president, and all of the outside directors; and an outside director serves as chairperson.

Remuneration for directors consists of monthly remuneration, a bonus and stock acquisition rights in the form of stock options; meanwhile remuneration for corporate auditors consists of monthly remuneration. The purpose of this structure is to ensure management transparency and fairness, and to provide enhanced incentives for the improvement of financial performance and corporate value in the short-, medium- and long-term perspectives. Furthermore, the amount of remuneration paid to directors and auditors is determined while taking into account the results of research conducted by a third-party organization to ensure an objective perspective.

# Toray Group's Corporate Governance System



## Related Information

> [Corporate Governance](#)

[Corporate Governance Report](#) [PDF](#)



## Ensuring Proper Business Conduct and Transparency

### Board of Directors' positive assessment of the implementation of the Basic Policy for Internal Control Systems<sup>1</sup>

Reporting scope: Toray Group

Fiscal 2017 target:

90%



Result:

94.6%

1. Evaluates the effectiveness of all the directors and statutory auditors for nine items in the Basic Policy on Internal Control System set in accordance with the provisions of the Companies Act of Japan, and monitors it as an effectiveness index of the internal control system.

Toray operates a Basic Policy on Corporate Governance based on Japan's Corporate Governance Code, and regularly publishes a Corporate Governance Report, which also summarizes the status of internal control systems.

The Toray Group will continue to make every effort to ensure compliance with laws and regulations, efficient execution of duties, preservation and management of information, and control over risks of loss.

In order to regularly verify the effectiveness of the internal control system by the Board of Directors and share it with stakeholders, Toray has set a KPI for "Board of Directors' positive assessment of the implementation of the Basic Policy for Internal Control Systems." The result for fiscal 2017 was 94.6%, surpassing the target of 90%.

#### Related Information

> [Basic Policy on Corporate Governance](#)

[Corporate Governance Report](#) 

> [Basic Policy on Internal Control System](#)

> [Information Disclosure Principles](#)

## Dialogue with Labor Unions

Toray holds meetings of the Central Labor and Management Council twice a year. The meetings are attended by directors at the senior vice president level and higher and labor representatives at the union head level and above. In addition to briefing the union on management information about the Toray Group, the meetings facilitate ongoing dialogue with the union. Resolution of labor issues is undertaken at separate Labor and Management Council meetings. As of March 2018, Toray Workers' Union membership stood at 8,635 workers.

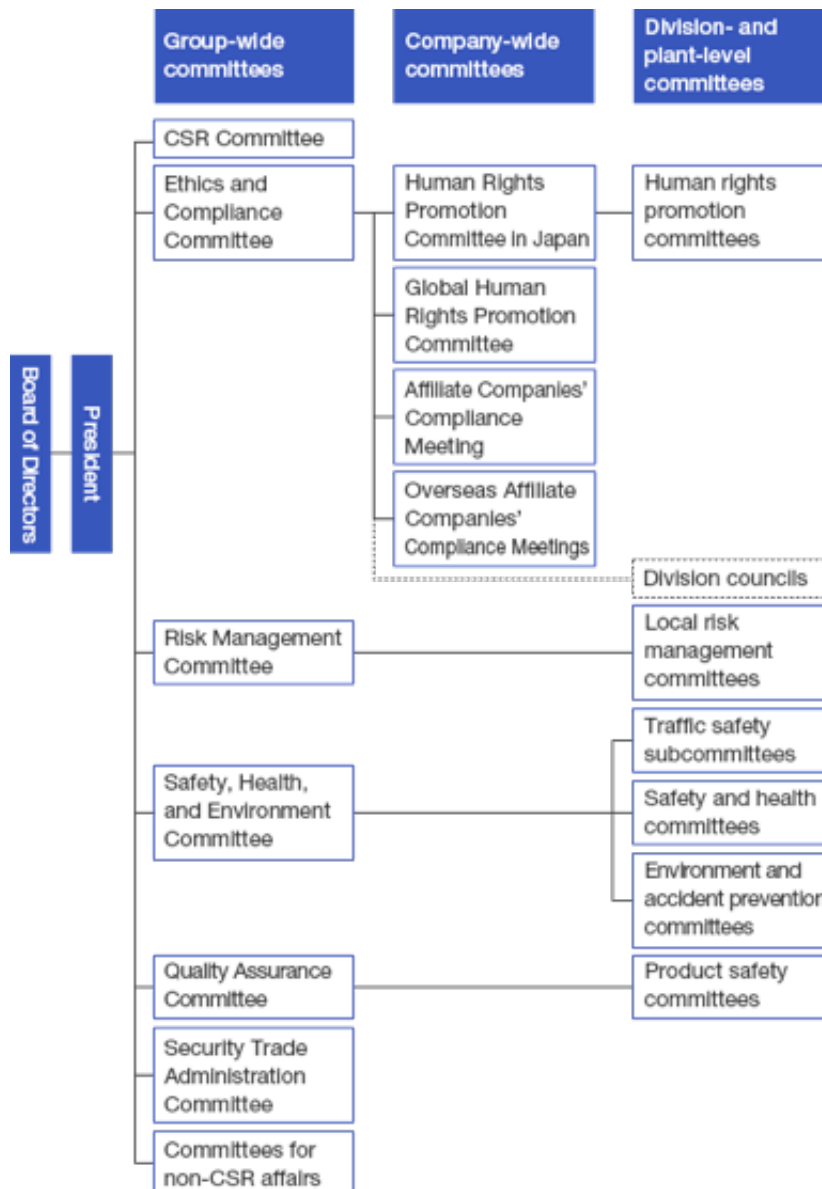
Corporate Governance and Management Transparency

# Implementing CSR Activities and Improving CSR Education

## Organizational Structure for Social Responsibility

The CSR Committee is headed by the chief social responsibility officer and coordinates five other group-wide committees, assigning tasks under each of the themes of the CSR Guidelines to them, in order to ensure the Toray Group comprehensively implements CSR initiatives. Furthermore, committees and meetings on CSR have been established at each group company to help implement group-wide CSR activities.

### Committee and Implementation Organization



## Promoting CSR Initiatives in Every Workplace

A special characteristic of Toray Group's approach to corporate social responsibility is its "CSR line activities," a unique employee participation system that emphasizes putting CSR into practice on the job. In every workplace, relevant departments present suggested tasks corresponding to each of the 10 items in the Group's CSR Guidelines. Based on those tasks, each workplace sets specific actions suited to their respective circumstances and continues to work accordingly.

Group companies also implement various other initiatives. In September 2017, Chori Co., Ltd. issued the Legal Compliance Handbook, which summarizes important laws, regulations, and rules to be followed. Toray International, Inc. issued its own edited CSR Handbook and launched a mechanism to share information on CSR and compliance among employees over the intranet. Toray Engineering Co., Ltd. issued the CSR Report 2017-2018, which featured its activities in fiscal 2017.



Legal Compliance Handbook issued by Chori Co., Ltd.



CSR Report 2017-2018 issued by Toray Engineering Co., Ltd.

## In-House Training on CSR-Related Issues

### Group companies implementing CSR education

Reporting scope: Toray Group

Fiscal 2017 target:

100%



Result:

100%

The Toray Group strives to ensure that social responsibility is firmly rooted in its culture by providing various training opportunities. In fiscal 2017, 100% of Group companies implemented CSR education, achieving the target.

In fiscal 2017, Toray and its group companies in Japan implemented CSR education for their employees. Head office staff visited group companies in Japan and confirmed progress on CSR initiatives and gave seminars in order to increase awareness of CSR.



Training at Du Pont-Toray Co., Ltd.



CSR seminar at Kansai TEK Co., Ltd.

## Dialogue with Stakeholders

The Toray Group's Corporate Missions call for contributing to customers, employees, shareholders, and society, by emphasizing stakeholders in its practice of business management. The Group is increasing its dialogue with stakeholders, both through its business operations and through briefing sessions and meetings in each region. In fiscal 2017, Toray conducted regular dialogue with shareholders and employees, and invited external experts in for a dialogue on the theme of Toray's initiatives and the United Nations Sustainable Development Goals, asking them to comment on their expectations and the challenges Toray faces.

Recommendations gained through the expert dialogue have been recognized as important issues for the Toray Group and each has been used to shape policies and included for implementation in the Sixth CSR Road Map across the Group. The Group will continue to seek opportunities to hear from stakeholders and gauge their expectations with the involvement of corporate management, in order to shape the direction of its management.

### Related Information

> [Materiality](#)

### Number of dialogue meetings with stakeholders

Reporting scope: Toray Group

Fiscal 2017 target:  
**Eight** per year



**Result:**  
**Eight** per year

## Corporate Ethics and Legal Compliance

Ensure all executives and employees uphold a sense of responsibility, fairness and high ethical standards, and always act in accordance with the law to maintain the trust of society.

### Policy and Framework

#### Sixth CSR Road Map goals

1. No major cases throughout the Toray Group of non-compliance with or violation of bribery regulations, antitrust laws, etc.
2. Promote compliance activities in accordance with the conditions of each country or region
3. Enhance awareness-raising and educational activities relating to corporate ethics and legal compliance

### Management

The Toray Group recognizes the absolute importance of compliance with laws, regulations, and social norms. Top management takes a clear position on corporate ethics and legal compliance in the execution of their own duties and guides the entire Group's approach to compliance.

### Promoting Corporate Ethics and Legal Compliance at Toray

Toray has established the Ethics and Compliance Committee, chaired by the president as a group-wide committee, and tasked it with deliberating on policy on corporate ethics, discussing measures for preventing violations, and promoting united efforts by labor and management. In each workplace, the general manager of the division or department serves as a leader, facilitating initiatives in a top-down manner.

In initiatives for group companies around the world, Toray has established the Affiliate Companies' Compliance Meeting and the Overseas Affiliate Companies' Compliance Meetings under the Ethics and Compliance Committee and promotes compliance activities in each company, country and region.

## **Company-wide Activities in Fiscal 2017**

Toray established or undertook the following company-wide initiatives in fiscal 2017 relating to corporate ethics and legal compliance. Group companies in and outside Japan also work independently on their own activities based on these initiatives.

- Implemented self-monitoring and mutual inspection system for internal control
- Provided thorough training on security trade controls
- Provided all employees with comprehensive information on antitrust laws and anti-bribery rules around the world
- Implemented initiatives to ensure strict compliance

## **Internal Rules for Ethics and Compliance**

Toray has established a set of internal rules for ethics and compliance, together with related standards and procedures. These internal rules set out the framework for practicing corporate ethics and legal compliance, and they are designed to foster a healthy corporate culture. The rules also outline how to respond to issues, identify causes and prevent recurrence, as well as initiatives to be taken by group companies in and outside Japan.

## Corporate Ethics and Legal Compliance

# Establishing a Corporate Culture of Total Respect for Corporate Ethics and Legal Compliance

## Corporate Ethics and Legal Compliance Code of Conduct and Handbook

The Corporate Ethics and Legal Compliance Code of Conduct is a strict set of standards that every Toray Group executive and employee closely follows when performing corporate activities. In the event that a violation is discovered, strict discipline is carried out in consultation with the Company's Rewards and Sanctions Committee.

At Toray and its group companies in Japan, all executives and employees, including contracted, part-time and dispatched workers, receive a copy of the Corporate Ethics and Legal Compliance Handbook, which explains expectations for proper conduct and Toray's Helpline, an internal whistle-blowing system. All employees are expected to be well-versed in the stipulations of this code.

Group companies outside Japan prepare national and regional editions of the Corporate Ethics and Legal Compliance Handbooks. Every executive and employee of group companies outside Japan receives a copy of the handbook to ensure that they are fully informed of the corporate policy.



### Main Content of the Corporate Ethics and Legal Compliance Handbook

- Carrying out proper transactions based on free, fair, and transparent market competition (compliance with Japan's Antimonopoly Act, Subcontract Act, and Act against Unjustifiable Premiums and Misleading Representations)
- Protecting the intellectual property rights of Toray and other companies
- Respecting local laws and regulations in all countries where Toray Group operates
- Respecting human rights and prohibiting all forms of discrimination
- Using proper accounting practices (complying with all relevant laws including Japan's Companies Act, all tax-related laws, and the Financial Instruments and Exchange Act)
- Complying with Japan's Foreign Exchange and Foreign Trade Act, Political Funds Control Act, and Public Offices Election Act
- Prohibiting any form of bribery involving stakeholders
- Corporate Ethics and Legal Compliance Helpline, an internal whistle-blowing system
- Framework for promoting corporate ethics and legal compliance at Toray

## Related Information

> [Corporate Ethics and Legal Compliance Code of Conduct](#)

## Corporate Ethics and Legal Compliance Education

### Group companies providing information and implementing education on major laws and regulations

Reporting scope: Toray Group

Fiscal 2017 target:

100%



Result:

100%

Toray posts information on CSR and legal compliance on its corporate intranet, and conducts monthly workshops at worksites where cases of misconduct by other companies are reviewed to foster workplace discussion. In addition, Toray relays important information about Japanese and other national legislation that relates to its business, such as antitrust laws, labor laws, and anti-bribery rules, to all group companies including those outside Japan.

Since fiscal 2012, Toray has provided online training courses on corporate ethics and legal compliance for all executives and employees, including contracted, part-time and dispatched workers. In fiscal 2017, Toray worked to raise awareness of human rights issues using case studies based on actual reports and consultations within the Toray Group, reminding all participants that issues can occur in any department.

Toray and group companies in Japan implemented bookkeeping and accounting compliance training, and discussed misconduct prevention at departments and group companies.

### Expanding the Whistle-Blowing System

Toray established the Corporate Ethics and Legal Compliance Helpline as a whistle-blowing system in fiscal 2003 and expanded the system to include all Toray Group companies in Japan in fiscal 2010. By introducing this system, Toray expects employees first to take the initiative in managing conduct with regard to corporate ethics and legal compliance, and to consult with a supervisor as soon as an issue arises.

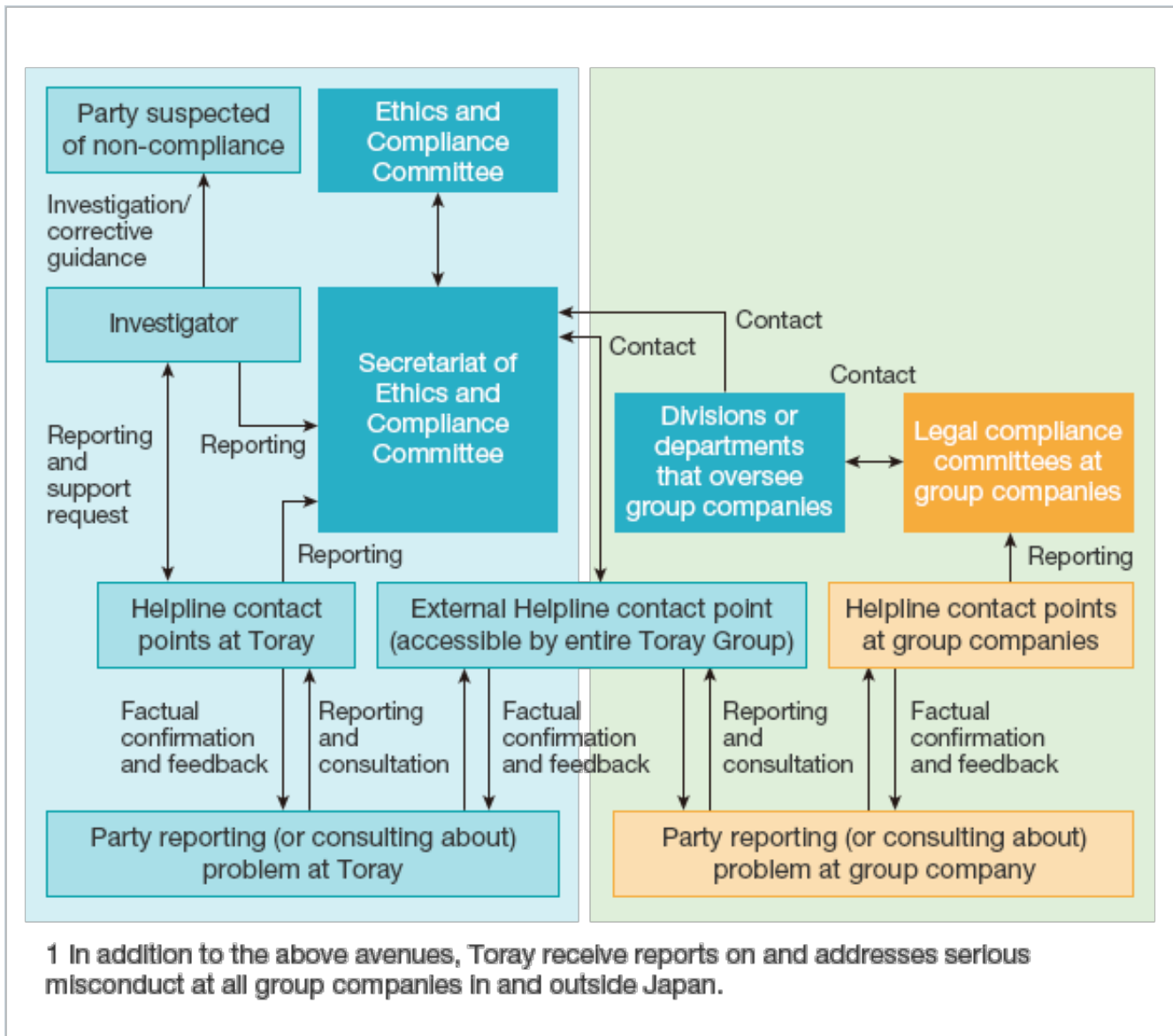
Recognizing that reporting or consulting with supervisors may be difficult, Toray ensures that employees have access to alternative means of reporting and consulting such as via contact points at its offices, plants and labor unions or directly to the secretariat of the Ethics and Compliance Committee via phone or email.

In addition, each Toray Group company in Japan has established a Helpline contact point. Moreover, Toray has also created an external Helpline contact point shared by all group companies in Japan to make it easier for employees to report and consult.



Each group company outside Japan has also established a Helpline contact point (internal, outside, or regional contact points). In fiscal 2017, the Helpline went into operation at all companies. There were reports in several countries/regions, and Toray is working to resolve the issues, while carefully confirming circumstances in interviews and investigations. In addition, in fiscal 2016, Toray established a whistle-blowing system for group companies to directly report serious misconduct such as violations of antitrust laws and bribery, and it is working to inform all Toray Group companies about the system.

## Corporate Ethics and Legal Compliance Helpline System (Toray and its Group Companies in Japan)<sup>1</sup>



## Implementing Internal Legal Audits

### Implementing internal legal audits of group companies, group companies improving problems found in internal legal audits in the previous year (%)

Reporting scope: Toray Group (Japan)

Fiscal 2017 target:

100%



Result:

100%

In fiscal 2016, Toray adopted a group-wide system for self-inspections and mutual internal control audits. Designated divisions of Toray and designated group companies in and outside Japan must receive a legal internal audit every other year.

In the first fiscal year, Toray undertook a legal internal audit of the designated divisions of Toray and designated group companies in Japan. In fiscal 2017, the Company confirmed the improvement status of the items pointed out by the audit and that the rate of improvement reached 100%. Legal internal audits were also implemented for all designated group companies outside Japan within the fiscal year.

## Corporate Ethics and Legal Compliance

# Improving Security Trade Controls

### Providing Thorough Training

The Toray Group recognizes that the reliable execution of security trade controls requires employees to be equipped with the necessary knowledge and management procedures and to follow those procedures. In order to boost the abilities of employees in this regard, the Group conducts ongoing training while continuing to improve the program. In fiscal 2017, Toray reorganized its hands-on training programs, which are tailored to deliver the practical knowledge needed in each area, and created four programs covering introductory training, practical operations (beginner) training, and compliance confirmation practice. Two types of year-long e-learning courses were also created with the aim of strengthening awareness of these initiatives and ensuring a solid understanding of elementary practical skills. A total of 8,046 employees participated in 11 types of training.

In fiscal 2017, a total of 303 more Toray Group employees passed the exam authorized by the Center for Information on Security Trade Controls in Japan, bringing the cumulative total of Toray Group employees who have passed the exam to 3,428.

### Practically Addressing Risks

The Toray Group performs risk management of security trade controls with regard to the export of all products, devices, materials, and samples, as well as the transfer of technologies outside Japan. Particularly strict management is necessary for TORAYCA™ carbon fiber and its composite materials, semiconductor coating agents, and water treatment membranes, which are listed as restricted items requiring export permission from the Japanese Minister of Economy, Trade and Industry.

The following measures to enhance risk management associated with security trade controls have been implemented based on conditions in and outside of Japan.

## **(1) Enhanced employees' capacity for accurate judgment at divisions/group companies**

In addition to the previous compliance operations, Toray set up a training program targeting technology divisions, covering topics such as the management of technical information. The new program focused on the points that needed to be strengthened at each business division. In addition, a training manager visited the development and manufacturing bases for intensive training (a total of 17 times with the participation of 388 employees).

## **(2) Conducted regular audits**

Toray carried out paper audits and onsite audits of group companies, and provided individualized guidance based on the results to help group companies make improvements.

## **(3) Enhanced information sharing and reporting**

Toray integrated and centralized information on concerns such as suspicious trade inquiries, reported or consulted with the appropriate authorities as required, and took the appropriate measures. The Company also shared suspicious trade information at various company meetings, and took steps to improve its risk management.

## **(4) Improved inspection systems**

Toray is pursuing a three-term plan (fiscal 2013-2019) for developing the next security trade control system. In May 2017, the Company also added functions to improve the efficiency and rigor of the compliance checks already in place.

■ **Corporate Ethics and Legal Compliance**

## **Compliance with Antitrust Laws and Global Anti-Bribery Regulations**

The Toray Group prepares compliance training materials and gathers examples of compliance violations to ensure that employees comply with each country's antitrust laws. Regular compliance training is also conducted, including at group companies outside Japan. To address regulations relating to bribery outside Japan, in fiscal 2016, the Toray Group introduced voluntary anti-bribery standards at group companies in Japan and at high-risk group companies outside Japan.

In fiscal 2017, internal audits of these matters were implemented under the group-wide system for self-inspections and mutual internal control audits that was put in place the previous fiscal year.

## ■ Corporate Ethics and Legal Compliance

# Protection of Personal Information

Toray operates internal rules for the management of personal information and conducts regular departmental inspections. In fiscal 2017, accompanying the amendment of Japan's Act on the Protection of Personal Information in May, the Company revised the internal rules and stipulated the handling of special care-required personal information and anonymously processed information.

Toray is currently working to verify rules and management systems of its group companies in and outside Japan and improving them based on the results.

## Corporate Ethics and Legal Compliance

# Violations Reported in Fiscal 2017

### Number of major violations of laws or ordinances

Reporting scope: Toray Group

Fiscal 2017 target:

0



Result:

1

On February 1, 2018, the Consumer Affairs Agency of Japan issued an order for action to Toray applicable to the TORAYVINO™ PT302F Megamori Pack, based on the Act against Unjustifiable Premiums and Misleading Representations. The Agency indicated that the labeling on the product box sold in February 2017 showed an erroneous number of cartridges, which amounts to labeling that would be misunderstood by consumers as more favorable. Toray has taken this order seriously and will endeavor to use labeling that would be easier for consumers to understand, as well as work to further improve awareness of legal compliance.

## Corporate Ethics and Legal Compliance

# Disclosure of Information Regarding the Ethical Treatment of Laboratory Animals

Toray Industries, Inc. aims to contribute to the human development and health enhancement through the creation of pharmaceuticals and medical devices.

We believe that animal testing is necessary and required for safety and efficacy verification in the development of new pharmaceuticals and medical devices. This testing must be carried out with respect for animal life, considering the 3R principles for animal experiments; Refinement (minimization of pain), Reduction (reducing the number of animals used), and Replacement (pursuit of alternatives to animals).

In order to ensure that animal testing is conducted ethically, we have established in-house rules in accordance with the Act Concerning Humane Treatment and Management of Animals, the Standard for Care and Management of Laboratory Animals and Alleviation of Pain, the Guidelines for Proper Implementation of Animal Experiments, and other relevant guidelines.

We have also set up the Animal Care and Use Committee, which carries out ethical and scientific review of all animal testing conducted at the company. All of our staff involved in animal testing receive training in standards of care and ethics on the use of animals in research to ensure appropriate conduct of animal testing based on the 3R principles.

We carry out self-monitoring and evaluation of animal tests to verify that each test is conducted appropriately.

We have received certification from the Health Science Center for Accreditation of Laboratory Animal Care and Use of the Japan Health Sciences Foundation.



## Risk Management

**Under normal conditions, the Toray Group focuses on mitigating risk and preventing crises from occurring. In the event of a crisis, the Group strives to prevent damage from increasing, by bringing the situation quickly under control and normalizing conditions with a prompt and appropriate response.**

## Policy and Framework

### Sixth CSR Road Map Goals

1. Strengthen corporate risk management throughout the Toray Group and mitigate risks
2. Instill greater risk management among employees by rolling out risk management education throughout the Toray Group

## Management

The Toray Group believes risk management is a fundamental element of corporate management and periodically identifies potential management risks to mitigate and prevent risks from materializing. The Group employs Crisis Management Regulations that set procedures for establishing a Company-Wide Emergency Quick Response System in the event of a major emergency to mitigate damage and rapidly secure business continuity.

## Risk Management Structure for Normal Conditions

Toray established a Risk Management Committee under the CSR Committee in 2005. In 2007, the CSR Operations Department started to serve as the secretariat for the Committee, regularly monitoring the progress of risk mitigation measures across the Toray Group and putting frameworks in place for planning and promotion of group-wide risk management measures. Under the Risk Management Committee, local risk management committees were established at each of Toray's divisions, departments, offices, and plants, as well as at group companies. Each local risk management committee implemented risk mitigation measures by linking its local efforts to the company-wide measures, and each reported its progress to the Risk Management Committee and the CSR Committee at the Toray Head Office.

Then, in April 2018, recognizing that strengthening risk management across the entire group is an urgent management issue, Toray transferred the risk management function from the CSR Operations Department to a dedicated team at the Corporate Strategic Planning Division that reports directly to the president. The aims of this move were to enhance communication with top management and do even more to strengthen and facilitate risk management as a key element of management strategy.

Then, in May 2018, Toray established the group-wide Risk Management Committee, which is chaired by the general manager of the Corporate Planning Division, tasking it with discussing and promoting shared awareness of risk management across the entire Toray Group. The new Risk Management Committee has taken over the activities of the former Risk Management Committee under the CSR Committee at Toray as well as those of the local risk management committees. The Overseas Crisis Management Committee and local crisis management committees have also been made subordinate to the Risk Management Committee.

## Major Changes

Changed items	Before the change	After the change
Definition of risk management	Separately managed risk under normal conditions and quick response at the occurrence of crisis	Managing overall risk under normal conditions and quick response at the occurrence of crisis
Organization in charge under normal conditions	CSR Operations Department	Corporate Strategic Planning Division
Organization in charge in the event of a crisis	Department in charge of the crisis	Corporate Strategic Planning Division
Implementing organization	Risk Management Committee (under CSR Committee)	Risk Management Committee (group-wide)

## Toray Group Risk Management System (fiscal 2017)



## Toray Group Risk Management System (fiscal 2018)



## **Basic Framework of Group-Wide Risk Management**

In April 2018, the Toray Group took over risk management and immediate response at the occurrence of a crisis, defining this scope of activities as “risk management,” and carries out the following three basic activities under this framework.

1. Specify the Toray Group priority risk and promote risk mitigation activities

2. Constantly identify and evaluate risk

The Corporate Strategic Planning Division constantly identifies and evaluates the risks that may affect the management of the Toray Group and internally reports and shares the results. Also, if necessary, the division structures response systems for specific risks or to avoid the occurrence of crises in advance.

3. Response in the event of a crisis

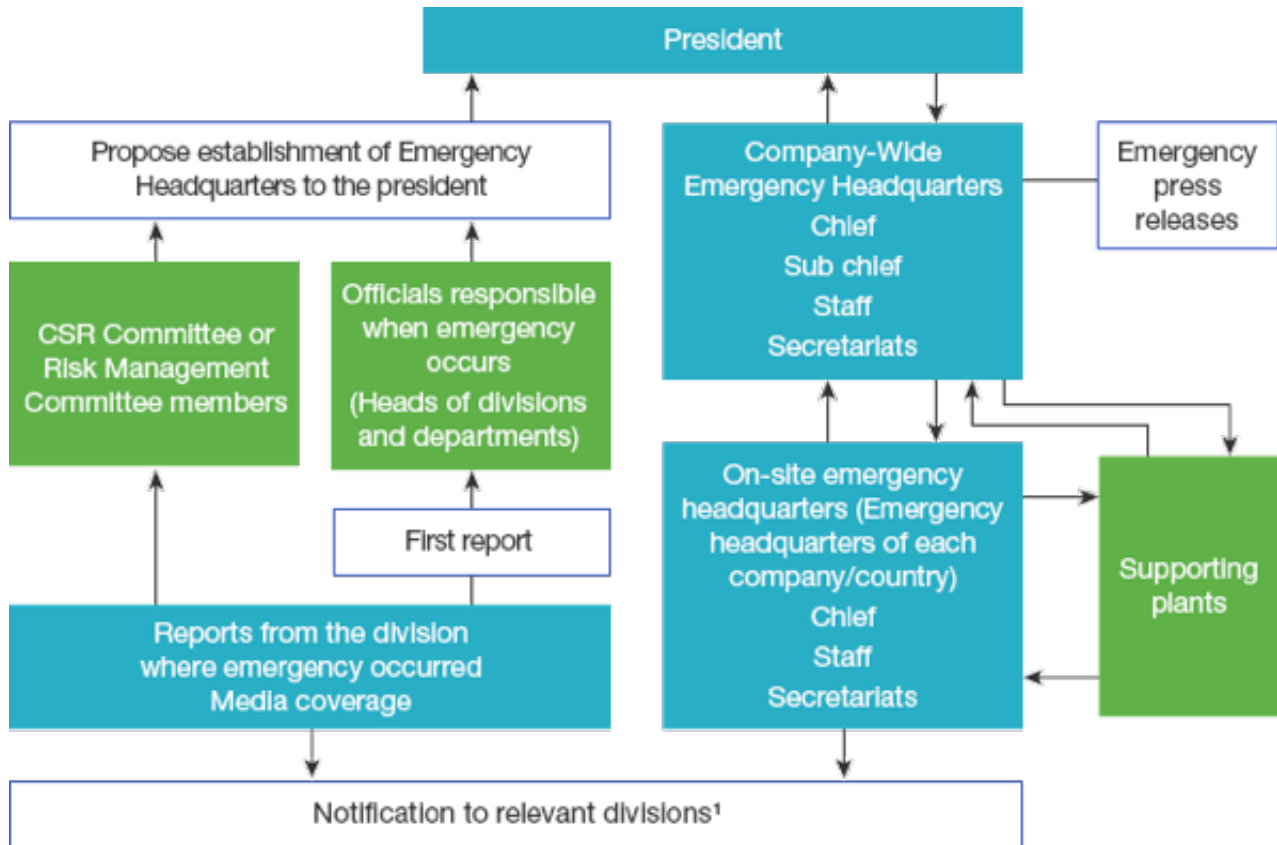
The Group sets up a group-wide quick response system to respond to the crisis that occurred.

## **Strengthening the Emergency Quick Response System**

The Toray Group has established Crisis Management Regulations, a set of clear fundamental principles that form the basis of a company-wide response in the event of a major crisis. The Group works to ensure the thorough implementation of these rules when required. Moreover, the Group reviews the rules as appropriate to prepare for new risks that emerge due to changes in the social environment.

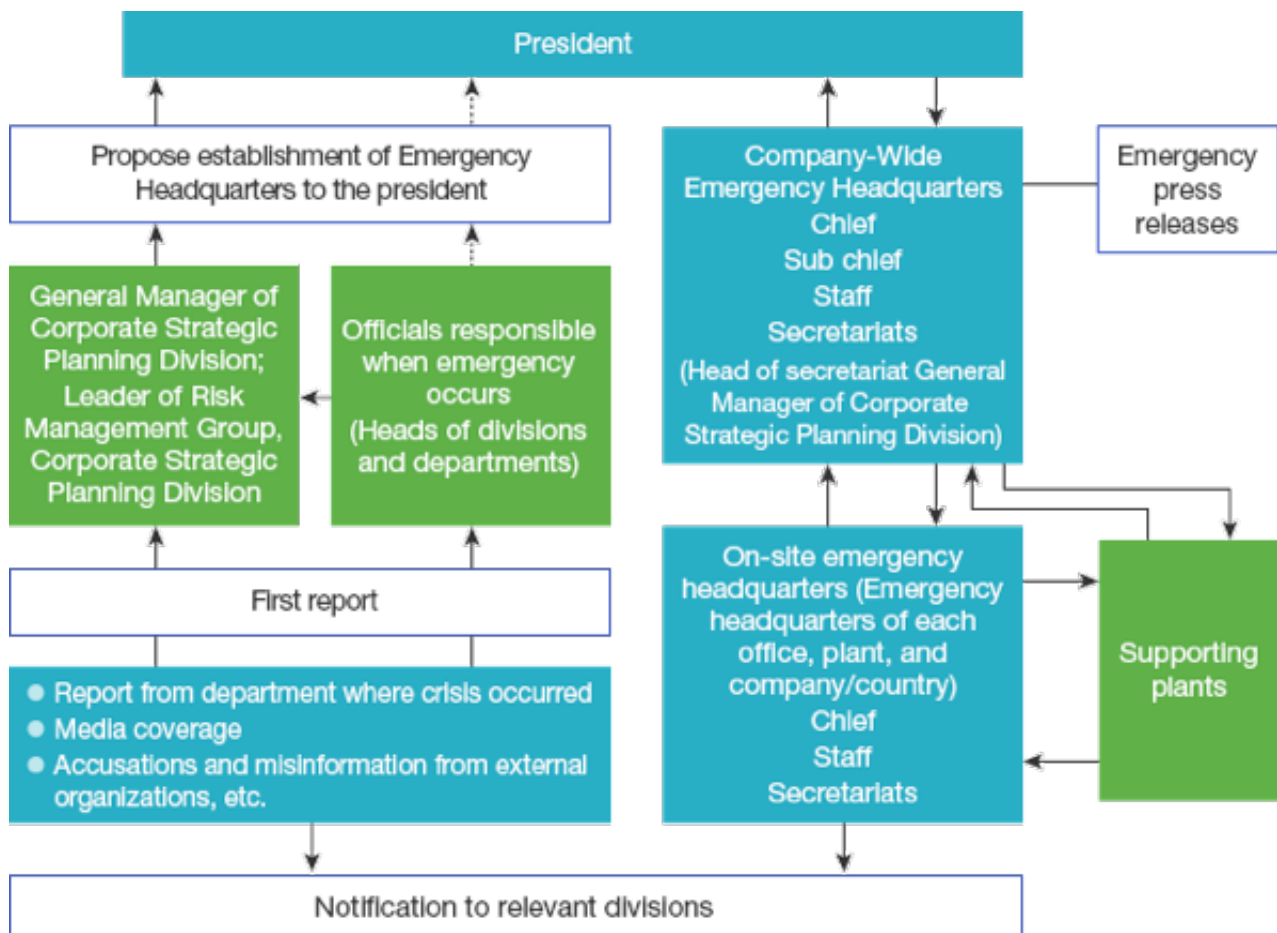
Accompanying the April 2018 change in the risk management system, the Toray Group reviewed its risk management system under normal conditions as well as the quick response system in the event of a crisis, and then revised the Crisis Management Regulations in May 2018. In order to ensure quick business decisions in the event of a crisis, the revised regulations clarify the reporting routes from the department where a crisis has occurred, covering group companies in and outside of Japan. In addition, the Group recognizes that ensuring the security of international business travel and taking steps to address political instability and terrorism as important issues in risk management. As a part of its emergency quick response system, the department responsible for each risk keeps employees informed with the latest information.

## Emergency Quick Response System (fiscal 2017)



1. Notification is conducted according to the Emergency Reporting Regulations for Significant Disasters, Environmental Accidents, and Other Crisis Outbreaks.

## Emergency Quick Response System (fiscal 2018)



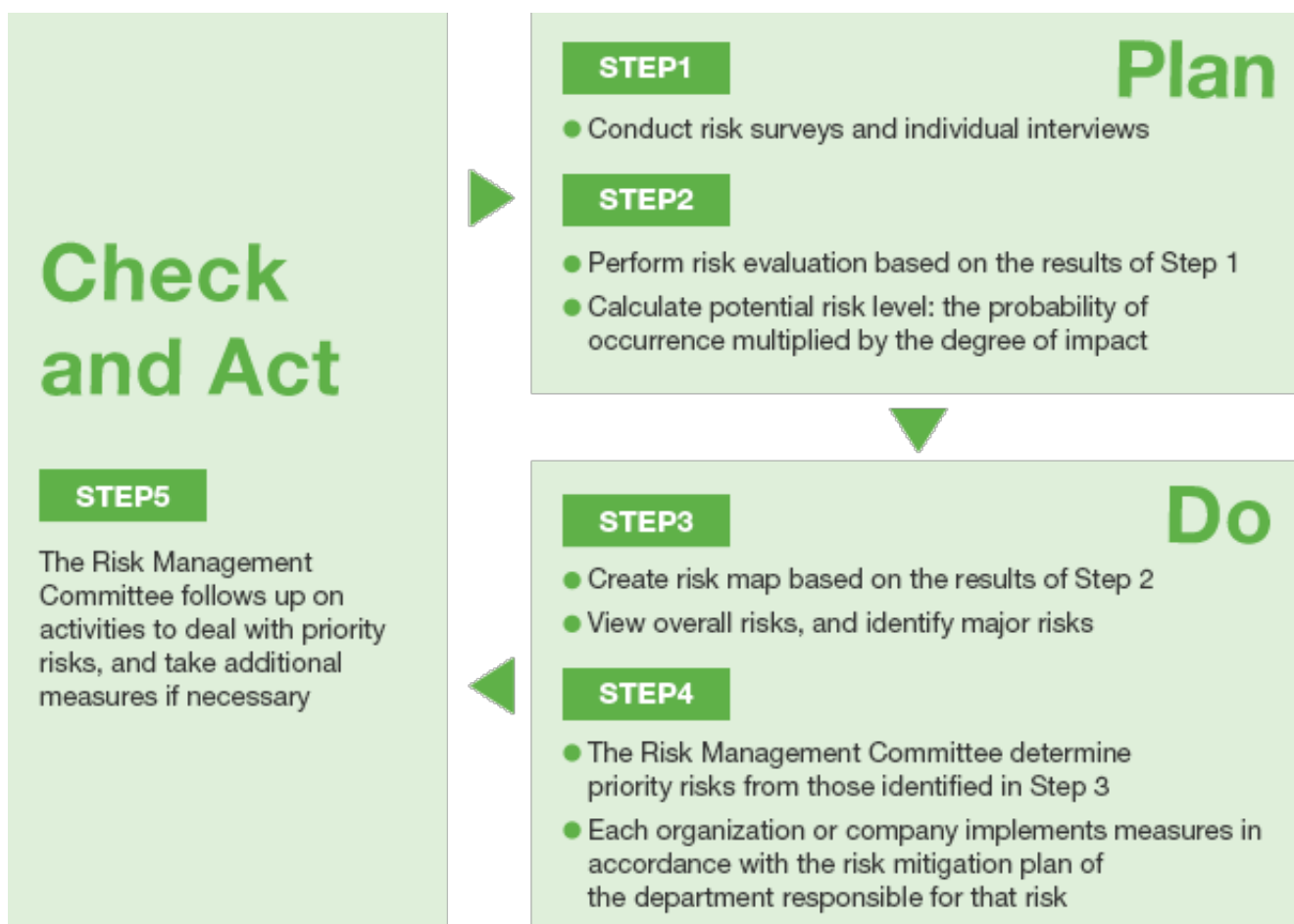
**Risk Management**

# Risk Management Initiatives

## Risk Mitigation Activities for Priority Risks

Toray reviews and assesses enterprise risks every three years and identifies priority risks from the results. The Company then works to mitigate selected priority risks using the plan-do-check-act (PDCA) cycle in three-year terms. Fiscal 2017 was the last year in the third cycle of priority risk mitigation. The issues remaining from efforts over the previous two years were organized again, and Toray proceeded with the necessary countermeasures for each risk. In addition, Toray again reviewed and assessed enterprise risks and selected group-wide priority risks for the fourth cycle starting in fiscal 2018. Toray is now working to mitigate priority risks for the Group overall, including group companies in and outside Japan.

## PDCA Cycle for Enterprise Risk Management



## Business Continuity Plan (BCP) Initiatives

In fiscal 2017, Toray confirmed the important products identified by each business division for the BCP for a large-scale earthquake and an outbreak of pandemic influenza, and updated the BCP for each of these products.

## Supply Chain Risk Mitigation

In fiscal 2017, Toray analyzed the responses of suppliers to its CSR survey, created an evaluation sheet for each supplier and fed back the results to each one. The Company also followed up on the progress made on socially responsible procurement by group companies outside Japan. The head office also provided support as needed, for example, sending templates of the CSR survey for suppliers to companies whose initiatives were falling short. In addition, Toray checks for use of conflict minerals<sup>1</sup> in and place of production of all products annually. This survey was carried out in fiscal 2017 as well.

1. Conflict minerals refers to the four minerals of gold, tin, tantalum and tungsten mined in the Democratic Republic of Congo and surrounding countries. These minerals are a source of funding for armed groups and anti-government organizations and that funding is often closely linked to exacerbation of conflicts, serious human rights violations, child labor, forced labor and environmental destruction. Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act in the United States imposes disclosure and reporting obligations on companies listed on a US stock exchange.

## Addressing Information Management (Leaks) Risk

Every year, Toray provides security training to employees to address the risks in information management (leaks). In fiscal 2017, the Company also gave all employees simulation drills on targeted e-mail attacks to foster and improve their security awareness.

### Group companies implementing continuous review of risk management

Reporting scope: Toray Group

Fiscal 2017 target:

100%



Result:

100%

## Identifying Major Forecasted Risks

Toray strives to constantly monitor trends in and outside Japan in order to identify risks that could have a major impact on the Group's management. When such risks are detected, Toray's Corporate Strategic Planning Division takes the central role in quickly forming a response team and taking the necessary measures for the Group.

## Risk Management Education for Employees

In order to foster employee awareness of risk management, Toray has set a KPI of the number of Group companies implementing risk management education in the Sixth CSR Roadmap. In fiscal 2017, the Company implemented e-learning and group education mainly on human rights issues and its own risk mitigation activities, tailored to the circumstances of each country.

### Group companies implementing risk management education

Reporting scope: Toray Group

Fiscal 2017 target:

60%



Result:

100%



## Risk Management

# Business Continuity Plan Initiatives

### Ensuring Preparedness for Major Earthquakes

The Toray Group maintains a business continuity plan (BCP) in case of a major earthquake, which has been identified as a priority risk to address.

In fiscal 2017, the Toray Group created BCPs for key products selected from each business in accordance with the procedures for developing BCPs for designated priority products in an earthquake. The Group also continued systematic seismic upgrades for plant buildings.

Since fiscal 2012, Toray has conducted annual company-wide drills on setting up an emergency response headquarters. In fiscal 2017, the Group conducted these drills based on a scenario involving a major earthquake along the Nankai Trough that resulted in extensive damage to group companies and plants situated in parts of Japan from Shizuoka Prefecture to further west. The drills included practical details such as operation of the employee safety verification system used by Toray and its group companies in Japan, and training in exercising quick judgment at disaster sites, with no advance disclosure of some scenarios. In conjunction with the drills, Toray reviewed the critical tasks that back-office staff at head office and divisions must complete in order to maintain minimum-required company functions even in the event of a disaster.

The Group also has in place a damage mapping system, which it deployed after the Great East Japan Earthquake. This system can rapidly and accurately map damage to business partners and group companies based on location data in an emergency. It helped the Group to provide a continuous supply of products during the April 2016 Kumamoto Earthquake and other disasters.

Toray will continue to improve the system by offering training, taking other measures, and strengthening preparedness for response in the event of an earthquake.



Company-wide drill to establish an emergency response headquarters (Tokyo)

## Addressing Influenza Pandemics

Toray's recent preparedness efforts for influenza pandemics included revising the Toray Group Influenza Pandemic Response Plan in June 2015 to address high and low pathogenic viruses. Toray also used this opportunity to revise the risk management framework and infectious disease control measures at the divisional, departmental, office, and plant levels, and put the changes into effect.

In fiscal 2017, Toray prepared and started to rolled out a business continuity and scale-back plan to prevent the further spread of infectious disease in a pandemic while still ensuring that the company can meet its social responsibility to continue supplying products. The plan ranks the importance of products and operations, and is designed to secure management resources including business structure and supply chain depending on the stage of the epidemic and other factors.

In addition, Toray applied to be an applicable business operator for specific vaccination during operations related to serious and emergency medical care under Article 28 of Japan's Act on Special Measures against the H1N1 Influenza (No. 31 of 2012) and was registered as such by the Minister of Health, Labour and Welfare of Japan.

Group companies in Japan have also prepared crisis management frameworks and infectious disease control measures and established business continuity and scale-back plans. Group companies outside Japan are implementing measures based on the situation in the countries where they operate.

## Human Rights Promotion and Human Resources Development

Respect human rights, provide safe and healthy workplaces for employees, secure and train personnel, and diversify while striving to protect employment.

### Policy and Framework

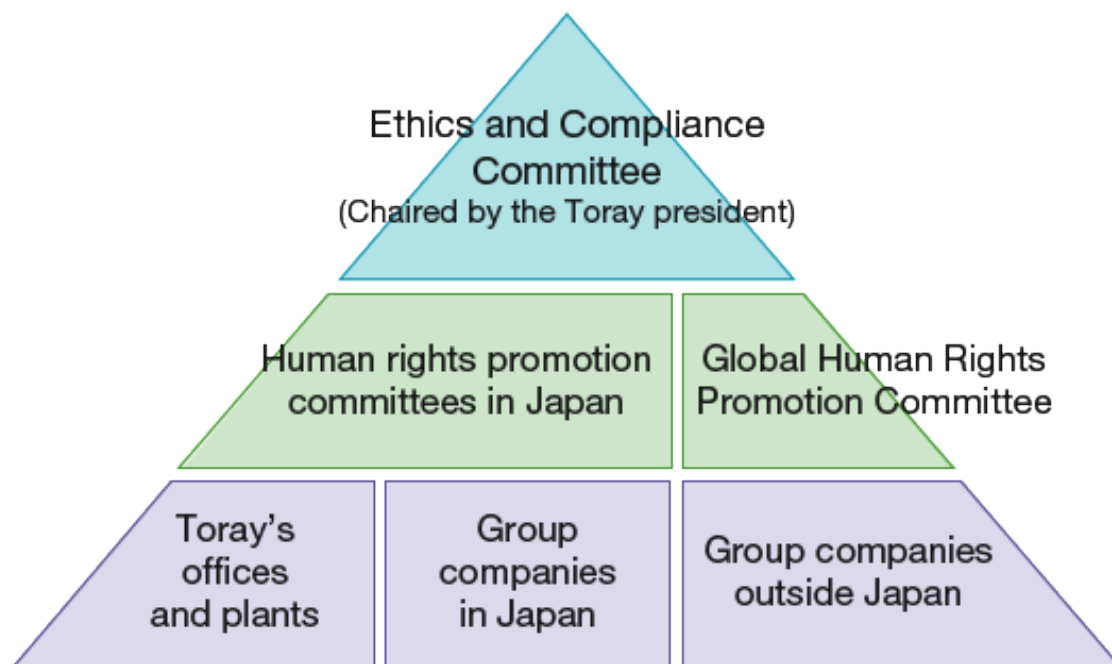
#### Sixth CSR Road Map Goals

1. Respect for human rights and fair promotion based on ability throughout the Toray Group by eliminating discrimination based on race, gender, education, nationality, religion, and physical attributes
2. Ensure work environments take into consideration employees' health and build a vibrant and rewarding workplace culture group-wide, working systematically to secure and train personnel

#### Management

### Human Rights Promotion System at the Toray Group

Under an Ethics and Compliance Committee chaired by the president of Toray, the Toray Group operates a Human Rights Promotion Committee in Japan and a Global Human Rights Promotion Committee. With the committee framework, the Group promotes human rights at offices and plants in order to ensure a positive working environment for employees.



**At group companies, each group company works on its own human rights initiatives with support from Toray.**

#### **Toray Group Policy for Human Rights** (Adopted December 2017)

We at Toray Group believe that respect for human rights is a mandatory principle for corporate management. Therefore, we respect international standards such as the United Nations Universal Declaration of Human Rights and the International Labor Organization's standards in compliance with the laws and regulations of countries and regions where we operate, and will endeavor to fulfill our duty of respect for human rights as a good corporate citizen.

1. We will respect human rights, character and individuality of employees and eliminate harassment and discrimination in workplaces. Furthermore, we will prohibit child labor, forced labor and unfair low-wage labor.
2. We will strive to promote respect for human rights throughout the entire supply chain related to our business activities. In addition, we will not be complicit in infringing on the human rights.
3. We will endeavor to understand adverse human rights impacts associated with our business activities and to avoid or reduce such influences.
4. If it becomes evident that we have caused or contributed to adverse human rights impacts, we will promptly take appropriate actions.
5. We will promote educational activities about issues of human rights for every employee and foster a proper understanding of issues among them.

## Human Rights Promotion and Human Resources Development

# Committed to Human Rights

At the Toray Group, respect for human rights is a mandatory management principle for ensuring the continuity of corporate activities and building positive relationships with all of the Group's stakeholders. The Group works to promote and raise awareness of human rights, for instance by declaring its commitment to the respect of human rights in its Corporate Ethics and Legal Compliance Code of Conduct. In the Code, discrimination of any kind based on race, creed, skin color, gender, religion, nationality, language, physical characteristics, socioeconomic status, place of birth, or any other personal characteristic is strictly forbidden in every process from recruiting and hiring to work placement, compensation, training, and retirement.

Since fiscal 2014, the Group has been tackling the issue of discrimination based on gender identification and sexual orientation. In January 2017, the Group established an employee hotline specifically for LGBT issues, which is operated by the Human Rights Promotion Section of the Industrial Relations Department of Toray. The Group addresses global human rights issues in accordance with the Toray Group Policy for Human Rights, considering the diverse cultures, customs and social norms of the countries and regions where it operates.

In addition, every year the Group evaluates human rights promotion initiatives, including the framework, the reporting/consultation system and education, and ensures that each company receives the support it needs.

### Human Rights Training

#### Group companies in Japan implementing human rights education and training

Reporting scope: Toray Group (Japan)

Fiscal 2017 target:

100%



Result:

100%

Toray holds human rights promotion campaigns annually to help increase awareness and understanding of human rights issues. In fiscal 2017, the campaign focused on enhancing awareness of the human rights of every person and on building positive, caring workplaces. The campaign was aimed at preventing sexual, power, and maternity harassment (the latter being discrimination based on pregnancy) and encouraged an understanding of LGBT issues while fostering a corporate climate that respects the dignity of others.



Human rights training seminar at Toray Aichi Plant

Furthermore, at each workplace, Toray communicated the increasing global emphasis that was being placed on human rights from a social responsibility perspective.

Training sessions were held for operational and administrative supervisors at Toray's offices and plants. Workshops were also conducted in conjunction with workplace study groups. As in the previous year, in fiscal 2017 the Human Rights Promotion Section Manager visited Toray's offices and plants as part of the campaign, and held workshops for human rights advocates. Human rights training seminars were conducted at 56 group companies in Japan.



Human rights training seminar at Toray Carbon Magic Co., Ltd.

#### Fiscal 2017 Human Rights Training and Seminar

Type of training		Number of sessions	Number of participants
Toray	Training at head office <sup>1</sup>	37	2,233
	Training at offices and plants	1,027	14,069
	Training at outside company	48	92
Group companies in Japan	Training at companies	144	10,967
	Training at outside company	165	228

1. Total amount of time dedicated to training: 3,181.5 hours

Human Rights Promotion and Human Resources Development

## Securing and Developing Human Resources to Create New Value

### Training expenditures per employee

Reporting scope: Toray

Fiscal 2017 target:  
No annual numerical target



**Result:**  
**99,069 yen**

The success or failure of a company is decided by its people—employees shape its destiny. Guided by this concept, the Toray Group considers securing and developing outstanding human resources as one of its most important tasks and a fundamental management priority. Based on the following four goals, the Toray Group is promoting human resource development.

- Development of fair-minded individuals who act with high ethical standards and a sense of responsibility
- Training of professionals with advanced expertise, technical skills and originality in problem solving
- Development of leaders who act with foresight and a sense of balance
- Development of individuals, professionals, and leaders who can play an active role in global business

### Employing a Diverse Workforce

The Toray Group employs talented human resources with high aspirations who can play an active role in global business, inclusive of gender and whether employees were hired out of university or mid-career.

Since 1998, Toray has been expanding its efforts to recruit diverse human resources, in order to drive the globalization of its business. The Company actively recruits non-Japanese students who are studying in Japan, and Japanese students who graduate from universities abroad. Then, it seeks to build a work environment where all employees are able to fully demonstrate their individual abilities and perform to their utmost potential.

## Number of Employees Hired in Fiscal 2017 (Toray)

	New graduates		Mid-career		Total
	Men	Women	Men	Women	
Managers/occupational specialists	—	—	2	0	2
G Course <sup>1</sup>	113	27	42	9	191
S Course <sup>2</sup>	71	5	55	13	144

1. An abbreviation for Global Level Assignment Course, the G Course is the career path for employees who wish to pursue a career at the Toray Group in a top management position or advanced specialization.
2. An abbreviation for Specified Assignment Course, the S Course is the career path for employees who wish to pursue a career as a manager, supervisor or expert in a specified occupation.

## Systematic and Effective Training

Toray develops well-designed training programs and systematically executes diverse training programs to enhance management, sales, production technology, and specialized skills, and to better equip employees to address globalization. These programs cover all levels of employees and fields, aiming to develop future management candidates while expanding and educating the base of core staff ready to employ their strong capabilities to lead on the front lines.

Over the recent years, Toray has concentrated on enhancing and expanding its development of global human resources through Overseas Training for Young Employees, the Toray Global English School, and Business English Intensive Training, as well as through joint sessions of the Toray Management School and Toray Group Senior Management Seminar. Toray also implements the Global Diversity Seminar for non-Japanese employees working at Toray. In fiscal 2017, training expenditures per employee at Toray stood at 99,069 yen.

In addition to training, the Group is adopting diverse personnel programs to develop an organization in which human resources who are ready for new challenges can play a greater and more active part in the company.



**Fiscal 2017 Training Programs at Toray**

	Management	Technical	Sales, marketing, and administration	Global	General
Directors	Director Training			Toray Group Executive Seminar	
Division and department managers	Management Training for General Managers			Toray Group Senior Management Seminar	
Section managers	Toray Management School	Training to Become Leaders in Technology Development	Training to Become Leaders in Sales/Marketing	Toray Trainee Program	Study programs for employees (at university and other institutes in and outside Japan) and overseas training for young employees
	Management Training for New Managers				
Non-Managerial Senior Level	Management Training for Supervisors	Training to Become Leaders in Technology Development	Marketing and Merchandising Strategy Training	Toray Management and Technology Training	Exchange Information with Different Business Fields
Non-Managerial Junior Level	Toray School of Technology and Business Administration	Mid-Level Engineer Training	Sales/Marketing Training	Business English Intensive Training	
		Second Technical Training			
Newly-Hired Employees	Introductory Training for Newly-Hired Employees	Practical Plant Training	Plant assignment	Intensive English Conversation Training for Newly-Hired Employees	

 Training also open to employees of group companies in Japan

 Training for "national staff" of group companies outside Japan, held in Japan

**Company-Wide Training Course Enrollment in Fiscal 2017 (Toray)**

Training category	Persons enrolled			Time dedicated to training per employee (hour) <sup>3</sup>
	Men	Women	Total	
Management	665	60	725	48.3
Technical	601	57	658	29.6
Sales, marketing, and administration	213	50	263	22.2
Global	208	48	256	39.4
General	243	74	317	17.6
Total	1,930	289	2,219	36.9

3. Time dedicated to group training at the Toray Human Resources Development Center. It does not include time for correspondence learning or study abroad, etc.

Management-by-objectives system <sup>4</sup>	Each employee establishes annual objectives. At the end of the fiscal year, employees and their supervisors meet to review accomplishments and the extent to which they were able to meet their objectives.
Personnel appraisal system <sup>4</sup>	Designed to facilitate a fair appraisal of employee contributions in terms of duties, responsibilities, capabilities, and performance.
Individual meeting system <sup>4</sup>	Employees meet with their supervisors twice a year in a one-on-one setting. Supervisors provide consultation on employee performance and new objectives.
Self-assessment system for managers, occupational specialists, and G Course employees	Employees are surveyed annually on topics concerning work experience and desires for interdepartmental transfer. Surveys can then be linked to individual personnel transfers and placement.
Career assessment system for G Course employees	Employees participate in a regular review consisting of presentations of daily operations and personnel interviews in order to focus on the direction of their future growth.
Job opening system	Employees are given an opportunity to apply for jobs inside the Company and proactively develop their career, while ensuring optimal staff assignment.

4. Applies to 100% of managers, occupational specialists, and employees pursuing G Course and S Course career paths.

## Development of Future Management Candidates for the Toray Group

### Group companies that have adopted a medium-term human resource plan

Reporting scope: Toray Group

Fiscal 2017 target:  
100%



**Result:**  
**100%**

The Toray Group implements training in order to systematically develop future management candidates. Numerous employees who have undergone the training are already active in management positions.

Since fiscal 2014, the Toray Group has been working on a succession plan and personnel development plan based on a medium- and long-term perspective and drawing up a medium-term human resources plan and practicing systematic personnel assignment to ensure that core staff can tackle important business issues. The Group implements human

resources strategies designed to support business strategies by verifying the availability of successor candidates for core positions and developing individualized development plans for future management candidates, including for national staff at group companies outside Japan.

#### Strategies for Developing Future Management Candidates

Program	Participants	Purpose	Year started	Total participants through FY2017
Management Training for General Managers	Division and department managers of Toray, Board members/officers of group companies in and outside Japan	Develop management leaders at Toray and group companies	2013	147
Toray Management School	Section managers of Toray	Develop future management candidates at Toray and group companies	1991	520
Toray Group Management School	Department managers of group companies in Japan	Develop management candidates focusing on group companies in Japan	2006	241
Toray Group Executive Seminar	Board members/officers of group companies outside Japan	Develop core staff at group companies outside Japan	2004	83

### Establishing a Global HR Management Fundamental Policy

The Toray Group established its Global HR Management ("G-HRM") Fundamental Policy in November 2011, with the goal of managing human resources from a common perspective shared by the entire Group, thereby surmounting differences between countries, regions, cultures, customs, and individual companies.

Under the policy, Toray practices a united approach to human resources management of each group company.

#### **Toray Global HR Management ("G-HRM") Fundamental Policy**

Established November 2011

True to its philosophy, "Contributing to society through the creation of new value with innovative ideas, technologies and products" and its embodiment through "Innovation," and in order to continue being a highly valuable corporate group for every stakeholder, Toray focuses on recruiting, retaining, and developing employees with high aspirations for the Toray Group, with the understanding that "Human Resources" are the most important asset in management.

As Toray Group continues to promote further business growth and expansion, we set the following four principles as the Toray G-HRM Fundamental Policy, despite all differences between countries, regions, cultures, customs, and companies in order to facilitate HR management with a common basis for all Toray Group companies around the world.

Step by step, each company is encouraged to implement and maintain a concrete HR management system in line with the following Toray G-HRM Fundamental Policy. However, at the same time, it is essential to value the merits of local HR management in each company based on the individual circumstances of country, region, culture, custom and company. Thus, it is necessary to promote the policy while integrating both approaches properly.

**1. Consistently recruit and retain core staff and promote long-term HR development programs**

- (1) Consistently recruit core staff based on mid/long-term HR management views.
- (2) Sustain long-term HR development through promoting individual career development, implementing timely assessments of development progress, and carrying out on-the-job training (OJT), together with training programs (Off-JT) and self-development.
- (3) Promote HR development by following up on each individual through MBO (Management by Objectives) and performance appraisal systems.

**2. Select and develop core staff who can win a place in the global competition**

- (1) Recruit highly capable staff who understand and support Toray's corporate philosophy, regardless of nationality.
- (2) Provide selected staff with opportunities for sophisticated high-level training and global careers.
- (3) Promote staff, who have skills to assume management responsibility for Toray Group companies, to top management positions of each company, and also give them opportunities for selection to executive positions as well as core positions of Toray Japan.

**3. Pursue a "placing the right people to the right jobs" policy while enhancing fairness, understanding (by employees) through convincing explanations, and transparency**

- (1) Make the best assignment for each employee and assigned organization by focusing on his/her ability and performance.
- (2) Place importance on fairness, understanding (by employees) through convincing explanations, and transparency when determining individual compensation, such as salary and bonus, by appropriately taking account all of the roles and responsibilities of the position, the employee's ability, as well as performance appraisal results based on the MBO (Management by Objectives).
- (3) Enhance the HR development system and the compensation system to value challenges as well as enhance motivation of average-level performers who contribute to their team.

**4. Continue various management methods to further strengthen the company's business structure**

- (1) Conduct head-count management and labor cost management as an entire company in a detailed and uniformed way.
- (2) Always sustain a flat, effective organizational structure and control the appropriate proportion of managerial staff.
- (3) Maintain and strengthen competitiveness through the appropriate utilization of diversified human resources such as contract employees, temporary staff sent from agencies, and external resources.

## Developing and Promoting Staff at Overseas Group Companies

### Number of core staff outside Japan who participate in training courses

Reporting scope: Toray Group (Outside Japan)

Fiscal 2017 target:

No annual numerical target



Result:

**214**

The Toray Group regards the development of core staff at its overseas group companies as one of its priority management objectives. The Group makes active efforts to promote employees locally hired at these companies to executive management positions, as well as to key posts and management positions at Toray's head office. In fiscal 2017, at Toray, five core staff outside Japan help manage the Toray Group, serving in senior director (*riji*) positions. Human resource development is systematically implemented using both on-the-job and off-the-job training. Off-the-job training consists of training implemented by each group company outside Japan. This is combined with grade-specific training programs held in Japan to ensure understanding of management principles and policies. These are linked with personalized long-term development plans. The Toray Group, with direct involvement from the head office, is developing and regularly providing management training courses outside Japan specially designed for the particular circumstances and needs of group companies in each respective country. In addition, the Group is systematically fostering human resources by offering career development opportunities such as domestic and international job rotations.

## Training Courses Held for Core Staff outside Japan in Fiscal 2017 (Toray Group)

### Japan-based courses

Training program	Managerial category	Number of participants
Toray Group Senior Management Seminar	Department managers	14
Toray Trainee Program	Section managers	30
National Engineer Key Person Training	Section managers	5
Toray Management & Technical Training	Unit managers	9
Total number of employees receiving training		58

### Courses held outside Japan

Training program	Managerial category	Number of participants
Toray Group U.S. Senior Management Seminar	Department managers	17
Toray Group U.S. Management Training	Section managers	22
Toray Group EU Senior Management Seminar	Department managers	11
Toray Group EU Senior Management Seminar	Section managers	15
Toray Group Indonesia	Department	12

Management Seminar	managers / section managers	
Toray Group Malaysia Management Seminar	Assistant department managers/section managers	17
Toray Group Korea Senior Management Seminar	Department managers	18
Toray Group East and North China Management Seminar	Section managers	26
Toray Group South China Management Seminar	Department managers	18
Total number of employees receiving training		156



Toray Group Senior Management Seminar for core staff outside Japan



Toray Trainee Program for core staff outside Japan

## Human Rights Promotion and Human Resources Development

# Promoting Diversity

The Toray Group is committed to promoting employee diversity to help build thriving workplaces where each individual's abilities can flourish.

### Fostering an Organizational Culture Conducive to the Career Advancement of Women

#### Women in management positions (%)

Reporting scope: Toray

Fiscal 2017 target:

No annual numerical target

**Result:**

**4.6%** (As of April 2018)

Toray has long encouraged women in the workplace and implemented policies to support women to build fulfilling careers. The Company promoted its first female manager in 1958 and introduced employee provisions for taking parenting leave nearly 20 years before parenting leave became mandatory in Japan. In 2003, a woman became president of a Toray Group company. Then, in 2004, Toray launched the Advancement of Women Project. As of April 2018, women held 9.0% of unit manager or higher positions and 4.6% of section manager or higher positions. In June 2015, Toray welcomed its first female director (*riji*), a position that is equivalent in scope and level of responsibility to senior management.

In fiscal 2016, Toray developed an action plan to increase the percentage of female employees promoted to managerial positions by focusing on individualized career plans and awareness of career development based on Japan's Act on Promotion of Women's Participation and Advancement in the Workplace, which was enacted on April 1, 2016. Under this action plan, Toray has set the following target, on average, for the five-year period from fiscal 2016 to fiscal 2020: ensuring a women's promotion rate that is at least 80% that of men.<sup>1</sup> This figure is the Japanese Ministry of Health, Labour and Welfare's yardstick for determining whether or not excessive discrepancy exists based on gender.

Specifically, Toray will take the following measures to achieve this goal:

- Request individualized career plans each year to be faithfully followed;
- Conduct morale surveys every other year and follow up on issues requiring attention; and
- Bolster training designed to raise awareness of career building.

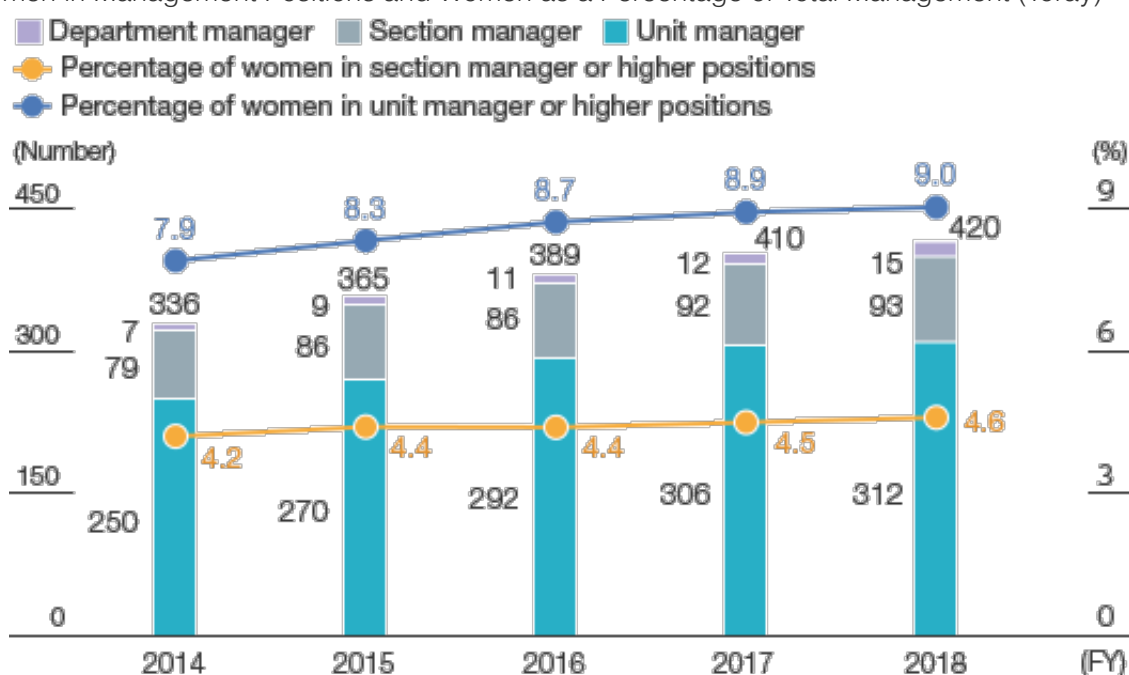
1. Promotion rate of women to managerial positions compared to that of men = Percentage of female employees promoted to managerial positions / Percentage of male employees promoted to managerial positions  
Percentage promoted to managerial positions = Individuals promoted to managerial positions / No. of employees who were initially hired into the G Course who are eligible for promotion to managerial position that year

## Promoting Communication Among Women in the Workplace

In 2014, women serving as general managers at the Toray Group developed and initiated a career advancement seminar for women serving as managers and occupational specialists, and it has now been held three times. Since fiscal 2016, the seminar participants have organized discussion meetings for women annually at all of Toray's offices and plants in Japan. Open to all women at Toray, the meetings offer an opportunity for women in all workplaces of various ages and at various stages of life to talk honestly about balancing work and home life, sharing and educating each other about the challenges and issues they face. Male employees are also included in the conversations at some of these discussion meetings.

Toray is committed to taking steady steps to promote women's advancement in the workplace, recognizing that results will naturally follow if the specific issues brought to light in these discussions on workplace conditions and employee lives are methodically addressed one at a time.

Number of Women in Management Positions and Women as a Percentage of Total Management (Toray)



Note: As of April each year

## Training Managers to Promote Women's Advancement in the Workplace and Support Balance between Work and Family Life

Beginning in fiscal 2017, Toray augmented the content of its Management Trainings for New Managers, which focus on promoting women's advancement in the workplace and supporting balance between work and family life. In this training, managers are instructed that part of their role is to convey clearly their expectations of employees, regardless of gender. They are equipped to train employees so that they can meet these expectations, provide proactive guidance on training opportunities (job rotations, training, etc.), and support work styles adapted to each employee's life stage by devising individual career plans and holding one-on-one meetings. The training also employs case studies on childcare leave and family care leave to improve managers' understanding of the systems for supporting balance between work and family life and guide them on how to approach this topic.



## Sharing Examples of Role Models on Toray's Corporate Intranet

Toray provides specific examples on its corporate intranet of how employees who have giving birth to and raised children did so while still working. By the end of fiscal 2017, the stories of 15 employees were posted on this website under the title of "Does This Help? My Story." These stories are intended to provide hints that help other employees achieve better work-life balance.



Sharing examples of role models on Toray's corporate intranet

## Employment of Persons with Disabilities

### Group companies that have achieved legally mandated employment rate of persons with disabilities

Reporting scope : Toray Group (Japan)

Fiscal 2017 target:

100%

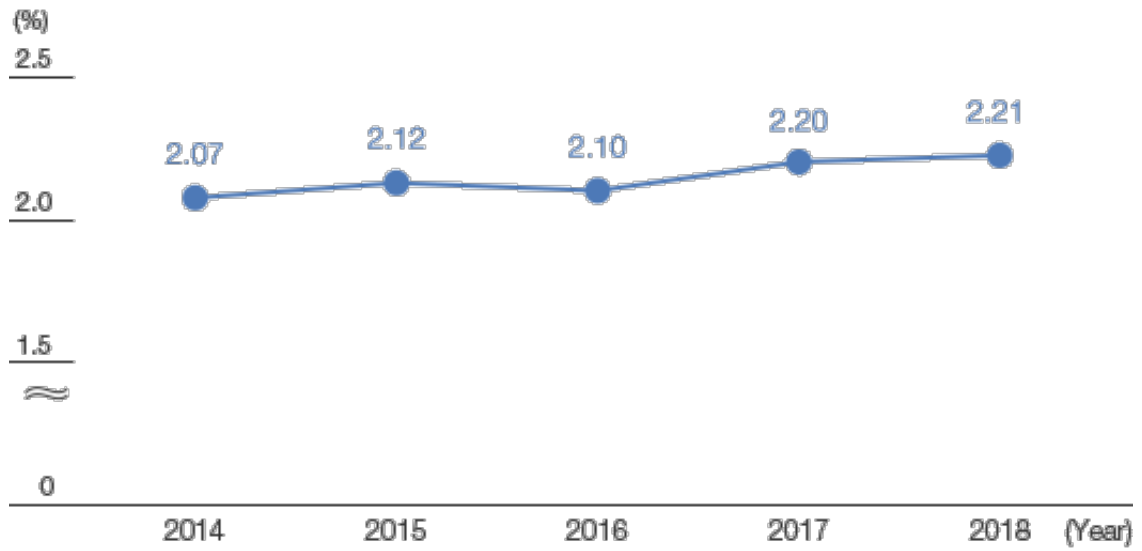


Result:

60.0%

The Toray Group hires and employs persons with disabilities, from those with physical challenges to persons with intellectual and mental challenges. The Group is making workplace improvements to remove physical barriers for persons with handicaps as well as instituting safety measures. Additionally, the Group provides comprehensive training upon work placement and gathers feedback from persons with disabilities to make workplace improvements. Further, Toray meets Japan's legally mandated employment rate of persons with disabilities, as do 58.6% of Toray Group companies in Japan. Group companies actively seek to hire persons with disabilities through public organizations and job placement agencies. However, some individual group companies do not meet the mandated legal requirement. Toray will continue to focus on this issue moving forward.

## Employment Rate of Persons with Disabilities (Toray)



Note: As of June 1 each year

## Re-employment System

As part of initiatives to encourage full utilization of skilled individuals over 60 years of age, in fiscal 2001 Toray introduced a re-employment system open to all of its unionized employees who wish to continue working. The Company expanded the system in 2005 to include employees in management and specialized fields.

## Human Rights Promotion and Human Resources Development

# Creating a Positive Workplace for Employees

### Helping Employees Maintain Work-Life Balance

#### Available annual paid leave used by employees

Reporting scope : Toray employees (non-managerial)

Fiscal 2017 target:

No annual numerical target



**Result:**

**88.4%**

Toray has been working to further improve systems that help employees achieve a harmonious balance between work and family life, by offering a wider variety of lifestyle options for men and women. Support systems that exceed those legally mandated for childcare, family care, and maternity protection are provided, the result of Toray's commitment to making them accessible and responsive for a diverse range of employee needs. In 2007, Toray was granted certification as a general corporate entity meeting the requirements for supporting the development of the next generation by Japan's Ministry of Health, Labour and Welfare.

After acquiring the certification, Toray revamped its child care support systems in June 2010 in an effort to encourage male employees to make use of them. Then in April 2011, the Company launched the Toray Smile Support Program,<sup>1</sup> a point-based system that lets employees choose from various programs that provide financial assistance for childcare and purchasing homes. Toray initiated a telecommuting program in April 2012, aimed at making it easier for employees to work while raising children or caring for family members.<sup>1</sup> Toray also expanded the scope of its commuting allowance for taking the bullet train in October 2012. In April 2013, Toray improved its support systems once again, offering special leave for parents to prepare children for nursery school, and extending eligibility for leave to care for sick children. In July 2016, Toray expanded its leave provisions for employees requiring special consideration as caregivers, and in January 2017, it eliminated restrictions on the number of times that employees can use long-term family care leave and lower-hour work schedule systems for caregivers. In July 2017, the Company started a flextime system without core-hour requirements for employees at the Tokyo and Osaka head offices.



1. Available to regular employees.

Major Support Systems for Employee Work and Family Life Balance

Category	Description
Long-term childcare leave	<ul style="list-style-type: none"> <li>• Available for employees using child care center services offering a leave of absence up to the end of March of the fiscal year in which the child turns one year of age or up to the time the child turns 18 months, whichever is longer</li> </ul>
Lower-hour work schedules for childcare	<ul style="list-style-type: none"> <li>• A maximum reduction of two hours per day, calculated in 15-minute increments, available until the end of the fiscal year in which the child is in third grade of elementary school</li> <li>• May be used concurrently with flextime system</li> </ul>
Long-term family care leave	<ul style="list-style-type: none"> <li>• Available for a total of 365 days per situation requiring leave to provide care</li> <li>• May be split up</li> </ul>
Spouse's childbirth leave	<ul style="list-style-type: none"> <li>• Available for three days in the event that an employee's spouse gives birth</li> </ul>
Lower-hour work schedules for caregivers	<ul style="list-style-type: none"> <li>• May be taken multiple times per situation in the three-year period following the first day of use</li> <li>• May be split up</li> <li>• May be used concurrently with flextime system</li> </ul>
Leave to care for sick children	<ul style="list-style-type: none"> <li>• Five days per year of leave per child available until the end of the fiscal year in which the child is in third grade of elementary school</li> <li>• Days not taken by the end of the fiscal year may be rolled over to the following fiscal year.</li> </ul>
Family care leave	<ul style="list-style-type: none"> <li>• Five days per year of leave available per family member</li> <li>• At maximum five additional days per year available when no other appropriate caregiver is available on those days</li> </ul>
Toray Smile Support Program	<ul style="list-style-type: none"> <li>• Welfare point system offering a selection of programs with an emphasis on providing support for childcare and home acquisition</li> </ul>
Childcare services payment assistance	<ul style="list-style-type: none"> <li>• Childcare coupons offering a 70% discount on services provided by participating companies issued as an additional Toray Smile Support Program service</li> <li>• No restrictions on number of coupons or age of participating employee's child</li> </ul>
Telecommuting program	<ul style="list-style-type: none"> <li>• Available for employees who meet certain requirements and have a family member requiring care or a child through the end of the fiscal year in which the child is in the third grade of elementary school</li> <li>• Available up to two days (15 hours) per week and no more than a maximum of six days (45 hours) per month for approved employees</li> </ul>
Registration system for reemployment	<ul style="list-style-type: none"> <li>• Registration system providing reemployment opportunities to former employees who resigned due to personal matters such as marriage, childbirth and childcare, nursing care for family members, or a spouse's work transfer</li> </ul>

	<ul style="list-style-type: none"> <li>The registration period is ten years. Registrants may be immediately eligible for regular employee positions depending on the content of their jobs, expectations of their role in the company, and their personal situations.</li> </ul>
Commuting allowance for bullet train or other limited express travel	<ul style="list-style-type: none"> <li>Allowance for tickets for applicable distances on bullet trains or other limited express trains available for employees who wish to avoid (cease) living apart from their families due to job transfers or employees who bear personal responsibilities such as caring for family members</li> <li>In certain cases, employees may be required to pay a part of the commuting expenses out of pocket.</li> </ul>

#### Utilization of Childcare and Family Care Leave Systems (Toray)

FY		2013	2014	2015	2016	2017
Employees taking childcare leave	Women	56	71	53	64	68
	Men	3	5	3	4	3
Employees taking family care leave	Women	0	2	1	2	0
	Men	1	1	4	1	1

#### Notes:

- Figures show the number of employees taking leave in each year.
- Rate of returning to work in fiscal 2017
  - Employees taking childcare leave: Women 100%, Men 100%
  - Employees taking family care leave: No women eligible this fiscal year, Men 100%

As part of its commitment to workplace innovation, Toray makes provisions to help employees balance work and family life. Since fiscal 2008, regular workplace discussions are held in each workplace to raise awareness of different working styles, and working late at night or on holidays is prohibited, in principle. All lights in the workplace are turned off at a certain time at night, and company-wide "no overtime days" take place one day each month. Toray has been working on ongoing initiatives to reduce overtime hours and encourage employees to take annual paid leave. (Employees used 88.4% of available annual paid leave in fiscal 2017).

In fiscal 2010, Toray set up a Work-Life Balance Committee and, in fiscal 2017, changed its name to the AP-G 2019 Labor-Management Committee. At the committee, representatives of labor and management review and discuss measures on a variety of themes with a view to supporting balance between work and family life, building workplace environments that facilitate diverse working styles, preventing overwork and reducing excessive working hours, and enhancing mental healthcare. The committee is working on further improvement and operation of the system by following-up on the total actual working hours of each employee.

## Employee Health

Toray is working to promote better health among employees, encompassing both offices and plants. Employee health management is viewed as a management priority, and strategic initiatives are underway, including some undertaken in collaboration with the employee health insurance association.

Toray is also addressing mental health, and since fiscal 2011 has been implementing employee stress check-ups through an external provider. Responding to the amendment of the Industrial Safety and Health Act of Japan, additional check items have been incorporated . The stress check-ups are also carried out at group companies in Japan.

In recognition of these efforts, in February 2018, Toray was listed as a White 500 Company in the Certified Health and Productivity Management Organization Recognition Program.

## Product Safety and Quality

**Provide safe, highly reliable products by striving to enhance management systems for product safety and quality assurance, and disclose appropriate information.**

## Policy and Framework

### Sixth CSR Road Map Goals

1. Achieve zero product accidents
2. Enhance the group-wide framework for product safety and quality assurance

### Management

To live up to its "customer first" and "quality first" commitments, the Toray Group has established policies on product safety and quality assurance and an organizational framework to pursue both in an integrated manner. Specifically, Toray's Quality Assurance Committee deliberates on basic policies and other matters, while the Quality Assurance Planning & Administration Department and the Product Safety Planning & Administration Department of the Quality Assurance Division plan and propose measures.

The medium-term management program, Project AP-G 2019, directs the Toray Group to pursue innovation and proactive management to achieve growth, and this hinges on securing product safety and quality. The Group continued to address individual areas for improvement and execute product safety measures in fiscal 2017.

Moving forward, the Toray Group will strengthen its management systems across the Group, pursuing continued synergies to enhance both product safety and quality assurance.

## **Quality Policy** Revised June 2007

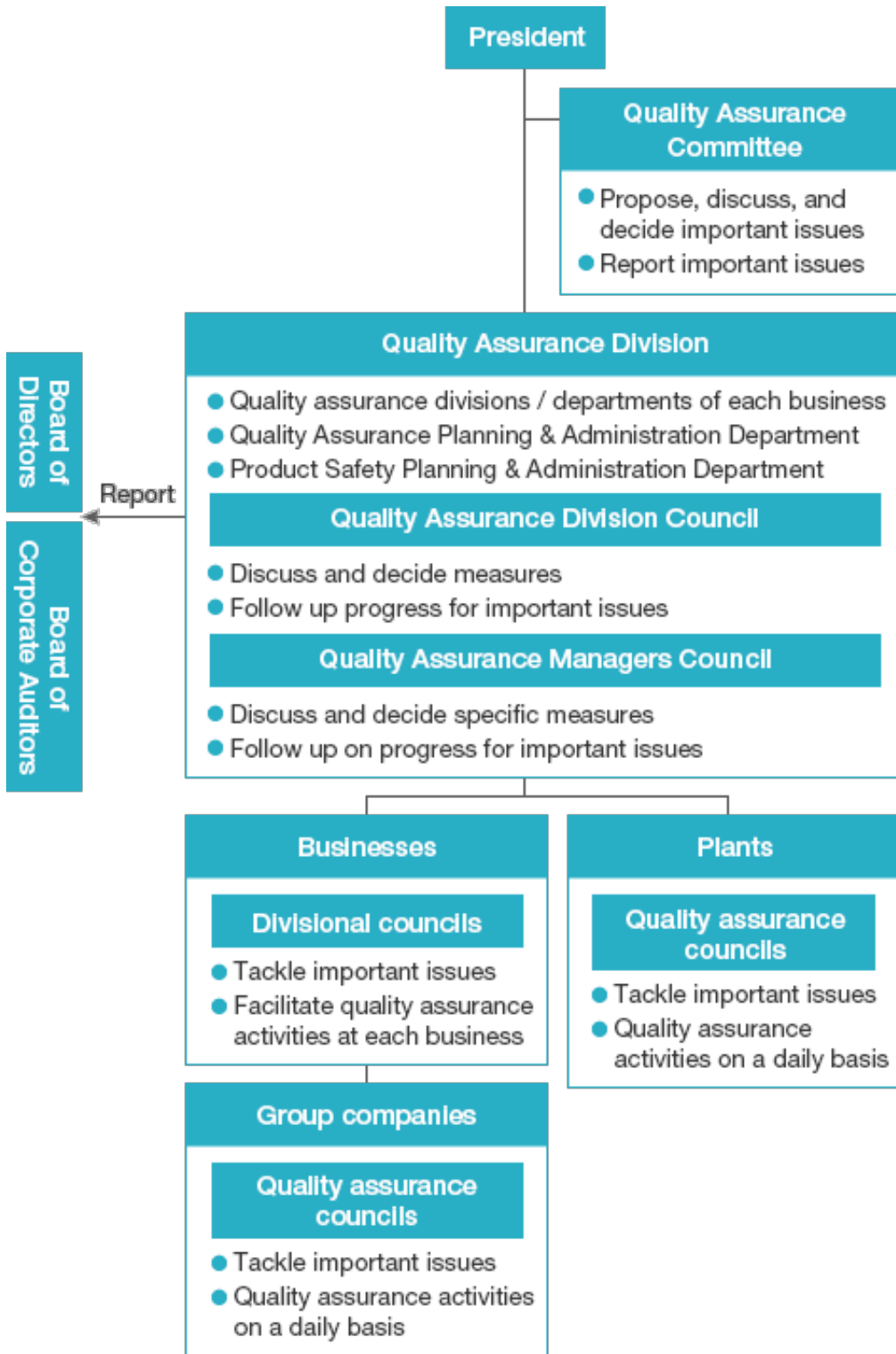
We give top priority to the product quality offered to our customers as well as to safety and to the environment in our corporate activities. We work on quality assurance with the stance of "Customer First."

1. We make our best efforts to meet our customers' expectations with products and services of high satisfaction.
2. We commit ourselves to abide by the "Quality First" principle, and to improve the quality and reliability of our products, in all our divisions, including sales, manufacturing and research and development.
3. We meet quality requirements at the stage of design and development, and ensure and enhance these in the manufacturing process.
4. We continuously strive to organize, maintain and improve our quality management system.

## **Framework for Quality Assurance**

Toray's quality assurance framework is shown in the diagram below. The Quality Assurance Managers Council promotes and implements the annual group-wide quality assurance themes that are established by the Quality Assurance Committee. At each division meeting, members further examine the company-wide issues that have been identified by the Quality Assurance Managers Council, breaking them down into action items that are designated every year for implementation. Production, technology, and sales departments cooperate to tackle quality assurance issues and raise the level of activities.





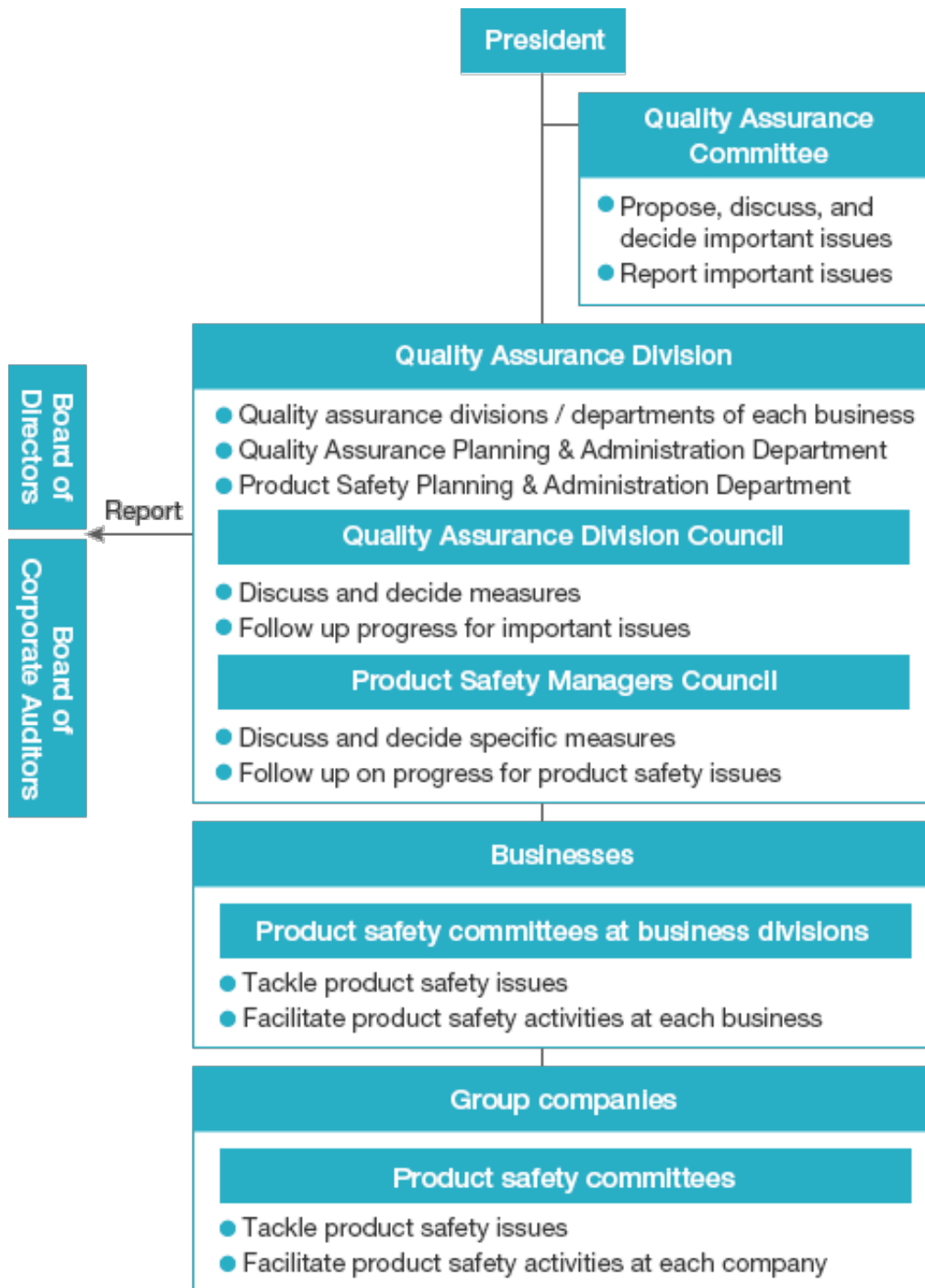
## **Product Safety Management Basic Policy**    Established January 1992

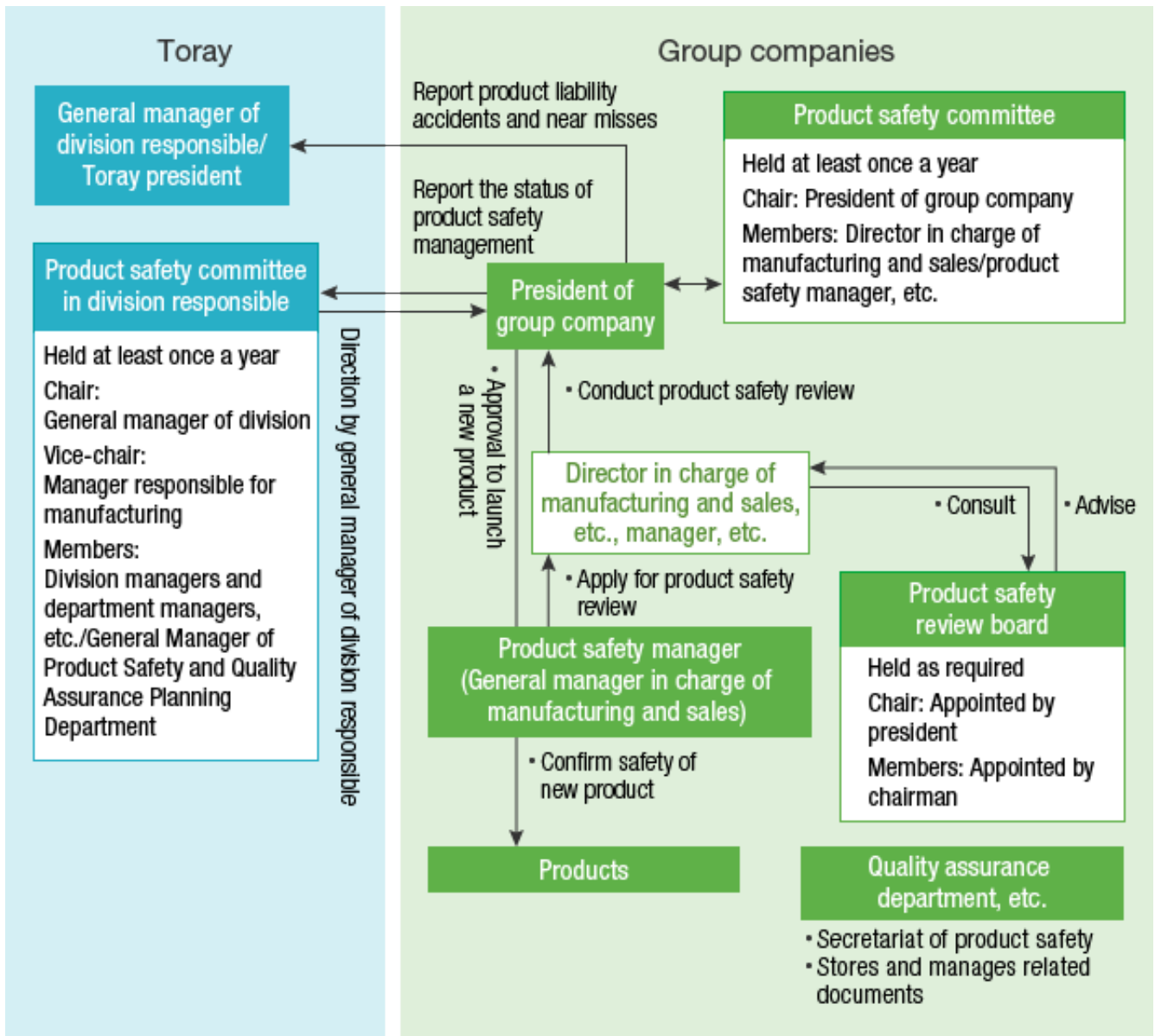
1. We shall place priority on the various measures required to ensure product safety.
2. We shall conduct adequate safety evaluations prior to marketing a new product.
3. For products already on the market, we shall take note of feedback from customers and the general public and always remain attentive to safety.

### **Framework for Product Safety**

Toray's product safety framework is shown in the diagram below. The Product Safety Managers Council promotes and implements the annual company-wide product safety themes that are established by the Quality Assurance Committee. Product safety committees at the departmental and divisional level further examine the company-wide issues that have been identified by the Product Safety Managers Council, breaking them down into action items that are designated every year for implementation. The action items are executed in cooperation with production, technology, and sales organizations at the departmental and divisional levels, to ensure thorough management of product safety and continue raising the level of management.

The Toray Group has been centrally tracking statistics on product accidents and the execution of product safety reviews since fiscal 2011.





## Product Safety and Quality

# Initiatives for Product Safety and Quality Assurance

## Reinforcing Compliance in Product Quality Assurance

Toray is working hard to reinforce its compliance efforts in the area of product quality assurance, following the November 2017 disclosure of inappropriate overwriting of product inspection report data by Toray Hybrid Cord, Inc.

On February 1, 2018, Toray appointed a board member (the general manager of the Product Quality Assurance Division) to be responsible for all product quality assurance operations throughout the Toray Group. This reorganization went into effect on April 1, and the quality assurance departments under business divisions were put under the direct control of the Quality Assurance Division. Toray will ensure the independence of the quality assurance organization in a system that stresses that everyone “has the integrity to do the right thing in the right way.”

The Quality Assurance Division supervises the Toray Group’s overall quality assurance system and its effectiveness and is responsible for quality assurance education. The following five issues will be addressed in fiscal 2018 and beyond.

1. Strengthen the Group’s compliance system for quality assurance
2. Ascertain actual situation for contracts with customers for quality assurance and create guidelines
3. Set up a quality data management system that prevents fraud
4. Foster a workplace culture that will not put pressure on quality assurance (including measurement) personnel
5. Appropriately maintain and manage measuring equipment and modernize and update the equipment

### Related Information

- > [Reinforcing Compliance in Product Quality Assurance](#)

## Augmenting the System for Implementing Quality Assurance

At Toray, the Quality Assurance Managers Council promotes and implements annual group-wide quality assurance themes that are established by the Quality Assurance Committee.

In fiscal 2017, as in the previous fiscal year, Toray identified the cause of serious product complaints and ascertained the status of countermeasures through mutual inspection and endeavored to resolve the problems in a fundamental way. Toray uses a wide range of tools that support quality assurance operations. The Company is managing inspection data trends using inspection data transfer systems with raw materials manufacturers over the Internet, and is bringing visibility to the 4M<sup>1</sup> change management in the manufacturing process through a Notes database and the process of new product design and development.

Moreover, the Company is providing quality assurance education by employee rank to improve the operational level.

1. 4M refers to the four main elements in the manufacturing process: "man," "machine," "method" and "material."

## Education and Training for Product Safety and for Quality Assurance

### Group companies implementing product safety and quality assurance education

Reporting scope: Toray Group (Japan)

Fiscal 2017 target: 100%



Result: 100%

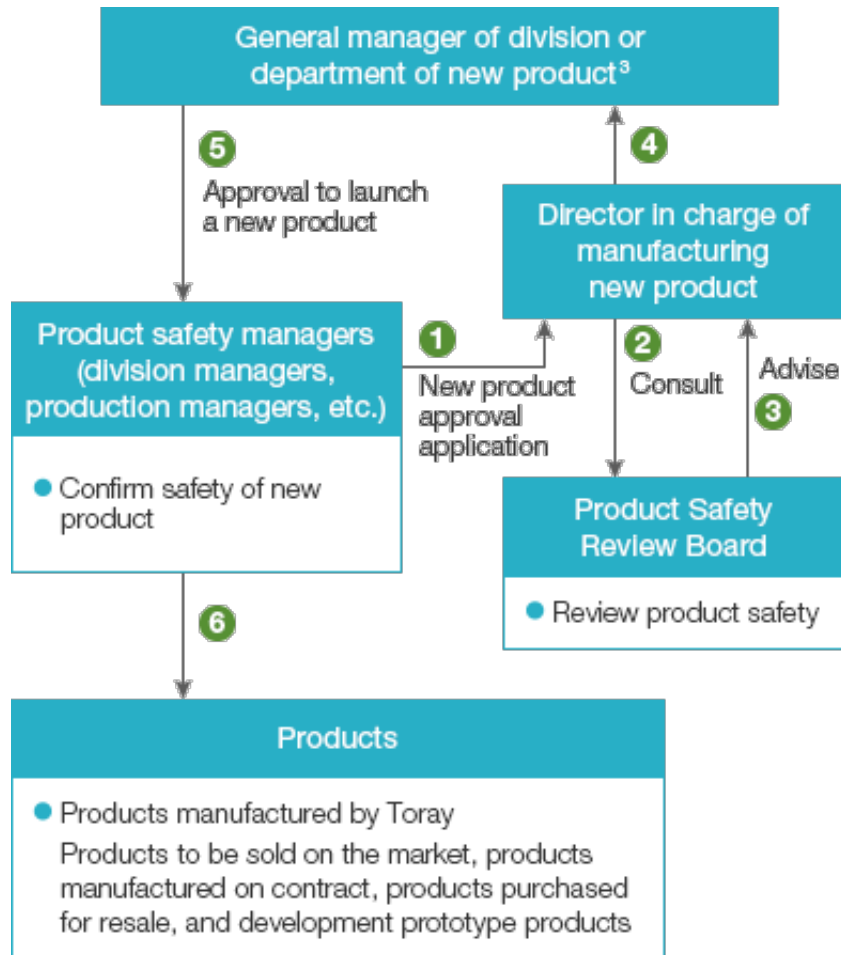
Toray provides training every year for newly appointed department and section managers at the Company and its group companies in Japan. Sessions are focused on the importance of product safety, the relationship between product safety and quality assurance, relevant laws and regulations, and Toray Group's product safety review system and quality assurance framework. Since fiscal 2013, all group companies around the world have conducted original product safety and quality assurance training tailored to their operations.

## Enhancing Product Safety Reviews

Safety reviews for new products are implemented under the responsibility of the directors in charge of manufacturing at Toray and the relevant directors at its group companies. These reviews encompass safety checks for the product itself and reviews of safety information supplied to customers such as safety data sheets<sup>2</sup> instruction manuals, warning labels, and catalogs. The reviews also examine the product's impact on the environment. If any doubts about product safety are identified, the Product Safety Review Board convenes a meeting comprised of impartial experts, including people from outside the Group when necessary. The product must then pass their review before being released to the market.

2. Since fiscal 2012, the Toray Group has been phasing in safety data sheets (SDS) based on the latest JIS standards that comply with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS). This process was completed in fiscal 2016.

Product Safety Review Flow Chart (Toray)



3. At group companies worldwide, this position is held by the president or a director.

## Preventing Product Accidents

### Number of product accidents

Reporting scope: Toray Group

Fiscal 2017 target:

0



**Result:**

**0**

In fiscal 2017, the Toray Group maintained the performance of the previous fiscal year, once again achieving its goal of zero product accidents.

## **Providing Product Safety Information**

The Toray Group provides customers with product safety information specifically tailored to the product or service. In its efforts to create a convenient environment for customers, Toray makes available toll-free numbers for customers to call and inquire about its mainstay consumer products such as home water purifiers and contact lenses.

## **Respecting the Eight Basic Consumer Rights**

In providing products and services, the Toray Group is fundamentally committed to respecting the Eight Basic Consumer Rights and strives to secure safety and quality of its products throughout the Group's business activities.

## **The Eight Basic Consumer Rights Excerpted from the Consumers**

### **International website**

- The right to satisfaction of basic needs
- The right to safety
- The right to be informed
- The right to choose
- The right to be heard
- The right to redress
- The right to consumer education
- The right to a healthy environment



## Product Safety and Quality

# Reinforcing Compliance in Product Quality Assurance

## Quality Data-Overwriting Incident at Toray Hybrid Cord

Investigations revealed that some of the product inspection report data provided to customers of Toray Hybrid Cord, Inc. (THC), a Toray subsidiary, had been overwritten. Provided here are an overview of the problem and report on the assessment of the adequacy of the response of Toray and THC by an Expert Committee, as well as the Committee's recommendations.

### (1) Problem Overview

It was discovered that THC inappropriately overwrote data that did not fit customer contract standards and changed it so that it would meet the requirement in the case of products such as tire cords and cords used for car hose belts manufactured by THC. A total of two people were involved: the General Manager of the Product Quality Assurance Section at the time the problem was discovered, and the previous General Manager. When the data deviated slightly either above or below the quality standards, the quality inspection data in the data management system was overwritten when the inspection results documents were authorized. After discovery, this fact was reported to the 13 clients whose inspection data was overwritten, and in all cases the clients stated that there had been no safety problems.

### (2) Formation of an Expert Committee, Results of Evaluation of Adequacy of Toray's Response and Recommendations

An Expert Committee was set up to investigate and evaluate the adequacy of the investigation carried out by THC and Toray into THC's inappropriate data overwriting, the measures taken to prevent reoccurrence, and the external response. As a result of its evaluation, the Expert Committee determined that the responses after the inappropriate data overwriting was discovered by THC, and by Toray, which led this response, were generally appropriate.

The Expert Committee made the following recommendations aimed at preventing this problem from occurring again.

1. Strengthen compliance in product quality assurance across the Toray Group
2. Ensure the implementation of the recurrence prevention measures that have been established
3. Review customer reporting policies

Toray has taken these recommendations seriously and is proactively addressing these issues across the entire Toray Group.

## Investigation of Quality Data

Toray took the discovery of the overwriting of product inspection data at THC as an opportunity to investigate all Toray Group companies.

### (1) Overview of Investigation

This investigation was conducted via a survey of 9,727 employees, managers and supervisors who handle product quality data, with names provided. The survey questions were broad, asking whether the respondent had ever been aware of problems relating to handling of product quality data and what could be improved about their everyday work practices that involve product quality data. Where answers to the survey were unclear, Toray undertook further investigation, seeking more detailed explanations, checking data and conducting interviews.

### (2) Survey Results

As a result of this thorough inquiry, Toray confirmed that there were no legal violations, no safety issues related to products sold by Toray and no incidents requiring public disclosure. Toray commissioned an Expert Committee to review the adequacy of the investigation's methods, content, results, and the adequacy of response measures to be taken. The Expert Committee concluded that Toray's investigation was appropriate

#### Views of the Expert Committee (Excerpts)

- The Committee confirms that in its group-wide investigation, Toray used appropriate methods and dedicated sufficient time and human resources to undertake its investigation, analysis and consideration.
- The Committee believes that the results of Toray's group-wide investigation, which determined that there were no incidents that involved legal violations or impacted product safety, and that the ongoing issues specified by the Toray Group are based on sufficient inquiry and are appropriate.
- Further, the Committee confirms that the policies and measures adopted by the Toray Group to address such ongoing issues are precise and effective.
- The Committee expects that Toray will continue, primarily through its Quality Assurance Division, to properly enact each of the planned policies and measures.

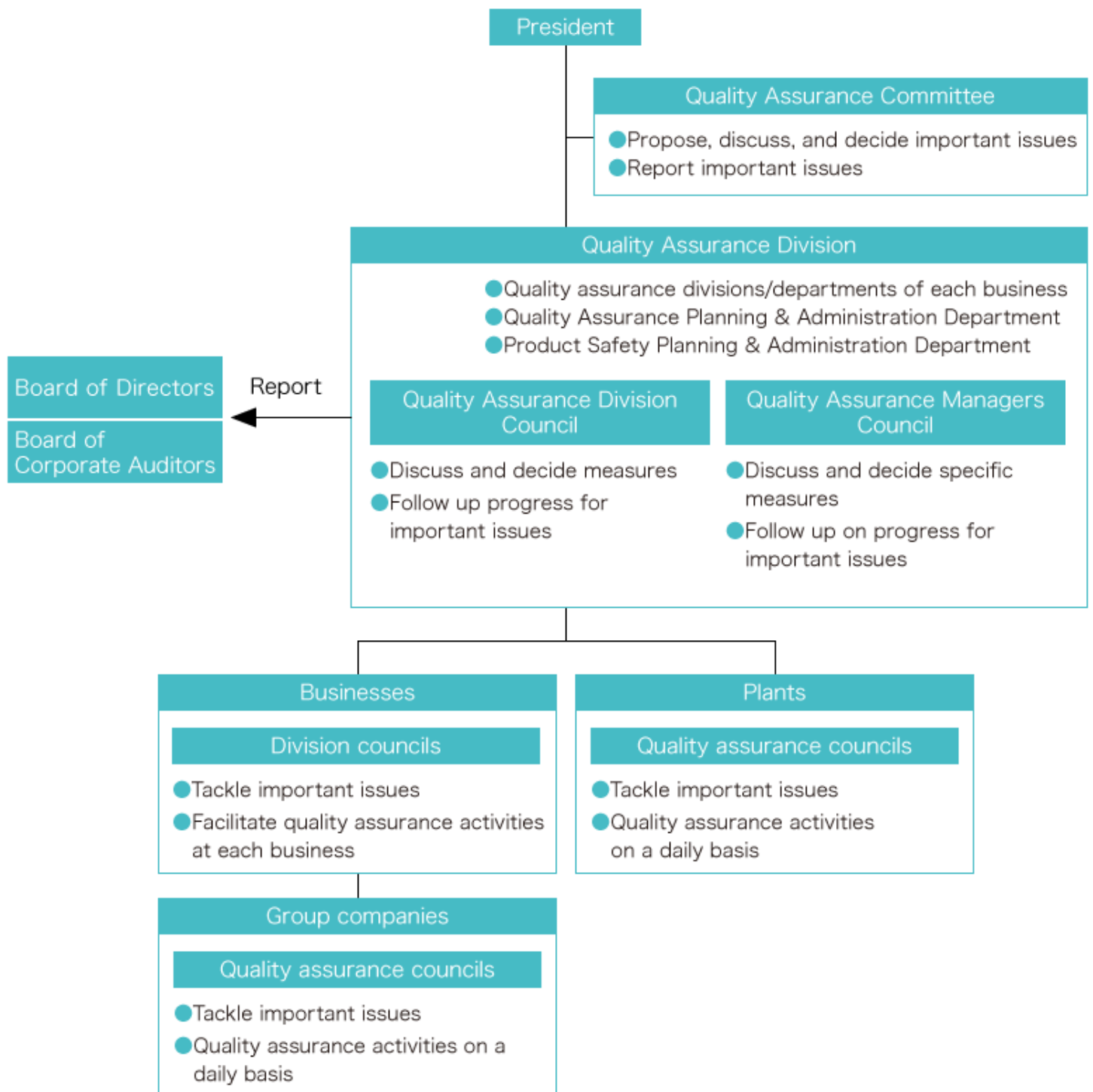
## Reinforcing Compliance in Product Quality Assurance at the Toray Group

The section below explains the new system put in place to strengthen compliance in the Toray Group's quality assurance and its role and future initiatives.

## (1) Establishment of Quality Assurance Division and Reorganization of Quality Assurance Structure

On February 1, 2018, Toray appointed a board member (the general manager of the Product Quality Assurance Division) to be responsible for all product quality assurance operations throughout the Toray Group. This reorganization went into effect on April 1, and the quality assurance departments under business divisions were put under the direct control of the Quality Assurance Division. Toray will ensure the independence of the quality assurance organization in a system that stresses that everyone “has the integrity to do the right thing in the right way.”

Framework for Quality Assurance



## **(2) Role of Quality Assurance Division and Future Initiatives**

The Quality Assurance Division supports and supervises the effectiveness of the Toray Group's overall quality assurance system, and as such, the Division supports and supervises the quality assurance systems of Toray and its group companies and guides their quality assurance education. The following five issues will be addressed in fiscal 2018 and beyond.

1. Strengthen the Group's compliance system for quality assurance
2. Ascertain actual situation for contracts with customers for quality assurance and create guidelines
3. Set up a quality data management system that prevents fraud
4. Foster a workplace culture that will not put pressure on quality assurance (including measurement) personnel
5. Appropriately maintain and manage measuring equipment and modernize and update the equipment

Implementing these measures will ensure that the Toray Group's quality assurance is dependable. In the event of any problems, Toray will communicate promptly and accurately with clients and resolve the issue.

Compliance awareness is indispensable to quality assurance. Given this, Toray will further augment education and make sure that all employees involved with quality assurance, including managers and supervisors, are thoroughly familiar with compliance. Toray will create a system and mechanisms that will protect quality assurance employees from being pressured and will foster a culture in which employees "have the integrity to do the right thing in the right way."

On February 1, 2018, we established the new Quality Assurance Division, which began its role in supporting the establishment of quality assurance systems in the Group overall and monitoring effectiveness. As the administrator, I will work proactively to strengthen compliance in quality assurance in the Group overall, and provide regular reports on the progress made on the various issues to the Board of Corporate Auditors and Board of Directors, ensuring that governance functions are being applied.

Directors and all employees will work together to put their all into ensuring that quality is managed appropriately not only in the quality assurance departments, but in all business activities, including R&D, production and sales. These efforts are underpinned by the understanding that quality assurance refers to activities that ensure that all Toray Group products, people and activities are continuously trusted by our customers and the broader society.



**Yukichi Deguchi**

Executive Vice President and Representative Member of the Board  
 General Manager of Corporate Strategic Planning Division, Quality Assurance Committee, Legal & Compliance Division, Security Trade Administration Department, and HS Business Development Department  
 Toray Industries, Inc.

## Product Safety and Quality

# Sites with ISO 9001 Certification

Sites with ISO 9001 Certification (as of June 2018)

## Toray: All 13 companies

Shiga, Seta, Ehime, Nagoya, Tokai, Aichi, Okazaki, Mishima, Chiba, Tsuchiura, Gifu, Ishikawa, Nasu

## Group companies in Japan: 22 companies

So-Wa Textile Co., Ltd., Toray Construction Co., Ltd., Toray Amenity and Civil Engineering Co., Ltd., Toray Engineering Co., Ltd., Toray Precision Co., Ltd., Du Pont-Toray Co., Ltd., Toray Opelontex Co., Ltd., Dow Corning Toray Co., Ltd., Toray Textiles, Inc., Toray Coatex Co., Ltd., Toray Amtecs Inc., Toray Monofilament Co., Ltd., Toray Hybrid Cord, Inc., Toray Plastics Precision Co., Ltd., Toray PEF Products Inc., Toray Fine Chemicals Co., Ltd., Soda Aromatic Co., Ltd., Toray Advanced Film Co., Ltd., Toray KP Films Inc., Toray Carbon Magic Co., Ltd., Toray Medical Co., Ltd., Suido Kiko Kaisha, Ltd.

## Group companies outside Japan: 42 companies

### USA

Toray Plastics (America), Inc., Toray Resin Co., Toray Fluorofibers (America), Inc., Toray Composites Material America, Inc., Toray Membrane USA, Inc. Zoltek Companies, Inc.

### Mexico

Toray Resin Mexico, SA de C.V.

### UK

Toray Textiles Europe Ltd.

### France

Toray Films Europe S.A.S., Toray Carbon Fibers Europe S.A.

## **Germany**

Euro Advanced Carbon Fiber Composites GmbH, Greenerity GmbH

## **Italy**

Alcantara S.p.A., Composite Materials (Italy) s.r.l., Delta-Tech S.p.A , DELta-Preg S.p.A

## **Czech Republic**

Toray Textiles Central Europe s.r.o.

## **Indonesia**

P.T. Century Textile Industry Tbk, P.T. Easterntex, P.T. Indonesia Toray Synthetics, P.T. Acryl Textile Mills, P.T. Indonesia Synthetic Textile Mills, P.T. Toray Polytech Jakarta

## **Thailand**

Thai Toray Synthetics Co., Ltd., Luckytex (Thailand) Public Company Limited

## **Malaysia**

Penfibre Sdn. Berhad, Penfabric Sdn. Berhad, Toray Plastics (Malaysia) Sdn. Berhad

## **India**

Toray Kusumgar Advanced Textile Private Ltd.

## **China**

Toray Sakai Weaving & Dyeing (Nantong) Co., Ltd., Toray Fibers (Nantong) Co., Ltd., Toray Polytech (Nantong) Co., Ltd., Toray Medical (Qingdao) Co., Ltd., Toray BlueStar Membrane Co., Ltd., Toray Plastics (Suzhou) Co.,Ltd., Toray Plastics (Chengdu) Co., Ltd., Toray Plastics Precision (Zhongshan) Ltd., Toray Film Products (Zhongshan) Ltd.

## **Republic of Korea**

Toray Advanced Materials Korea Inc., STEMCO, Ltd., Toray Chemical Korea Inc., Toray Battery Separator Film Korea Limited, Toray BSF Coating Korea Ltd.

## **Taiwan**

Toray Advanced Film Kaohsiung Co., Ltd.

## Facilitating CSR Initiatives Throughout the Supply Chain

Promote CSR initiatives in areas including environmental preservation and human rights throughout the entire supply chain by working closely with suppliers, processing vendors, customers and distribution companies.

## Policy and Framework

### Sixth CSR Road Map Goal

1. To ensure socially responsible procurement by the Toray Group, request major suppliers and business partners to practice CSR and work with suppliers to promote greater awareness of human rights, social, and environmental issues

### Management

The Toray Group recognizes that socially responsible procurement is an issue that must be addressed throughout the supply chain. To this end, the Group's CSR Procurement Guidelines mandate the delivery to customers of materials and products that meet social and environmental requirements via environmentally friendly modes of transport. The Group seeks the understanding of suppliers and distribution partners in this effort.

To ensure socially responsible procurement across the Group, Toray has established a working group under the Risk Management Committee. The working group strives to ascertain the status of CSR practices at suppliers, responds to customer inquiries about Toray's CSR practices, and supports group companies in this area.

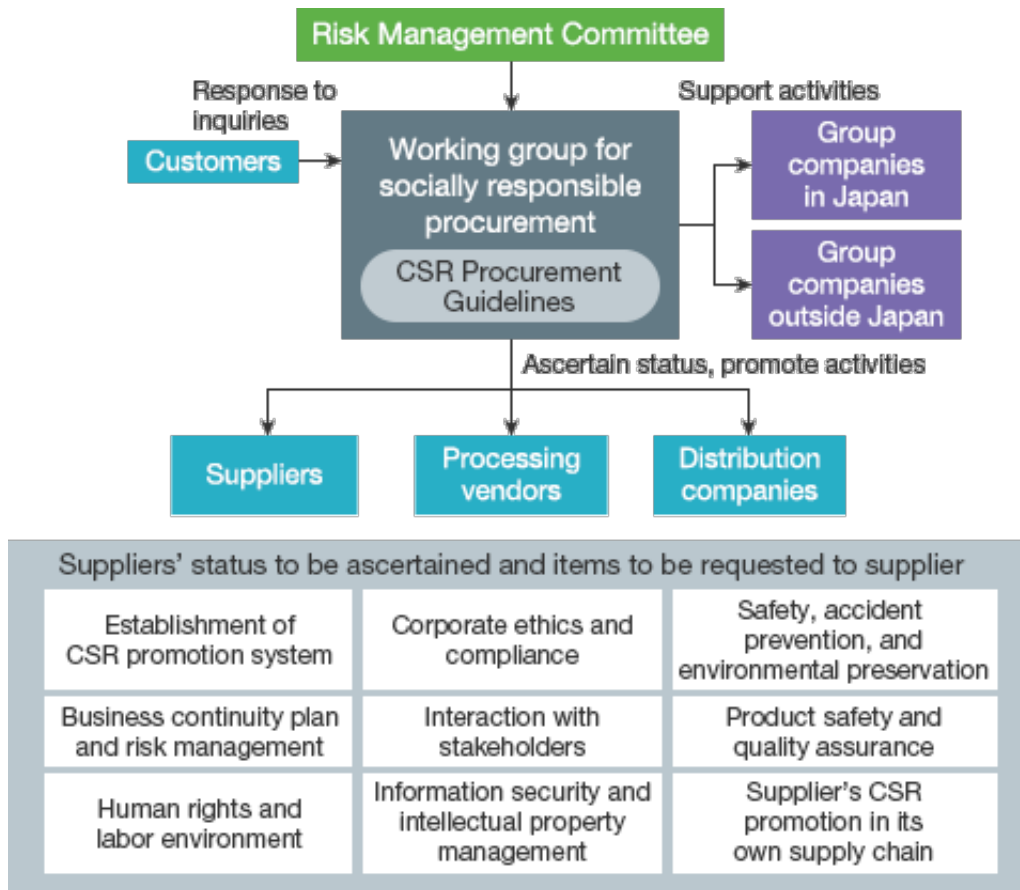
### CSR Procurement Guidelines Adopted December 2004

1. Establish an internal CSR organization and be committed to CSR
2. Work to enhance corporate ethics and comply fully with all laws and regulations
3. Position safety, accident prevention, and environmental preservation as a management priority and practice green procurement and purchasing whenever and wherever possible
4. Put crisis management systems into place, including capabilities for responding swiftly in unexpected situations, and disclose accurate information
5. Encourage dialogue and cooperation among all stakeholders



6. Ensure product safety as a precondition for supplying products
7. Respect human rights, eliminate discrimination, and improve workplace environments; prohibit forced labor, slave labor, child labor, and unfair low-wage labor
8. Maintain the confidentiality of information and respect others' intellectual property rights

## Management Framework for Socially Responsible Procurement



## Policies on Purchasing and Distribution

As a manufacturer of advanced materials that supplies a wide range of materials and products, the Toray Group must engage in upstream management that reflects the needs of end users, including production facilities and the procurement of raw materials and products. Accordingly, the Group has established its Basic Purchasing Policies to emphasize this approach and ensure fair purchasing practices.

The Group also operates under Basic Distribution Policies that require fair and equitable transactions and take environmental considerations into account. The Group is committed to continually improving the quality of distribution and reducing its environmental impact.

## **Basic Purchasing Policies** Revised December 2004

1. Toray does its utmost to select suppliers and determine actual purchases fairly and on the basis of economic rationality, with consideration for price, quality, capability to provide stable supplies, technological capabilities, reliability, and other factors.
2. In selecting suppliers, Toray opens its doors to a wide range of companies inside and outside Japan. Toray does not rely solely on vendors it has existing or past relationships with, or on members of its corporate group.
3. In making purchases, Toray complies with relevant laws and regulations while taking environmental preservation and fulfilling corporate social responsibility (CSR) issues into account. Toray actively pursues green procurement and purchasing as part of its environmental efforts.
4. Toray works to maintain and improve the quality of purchased products through cooperation with its suppliers.
5. Toray works to uphold its corporate social responsibilities on a company-wide basis.

## **Basic Distribution Policies** Adopted December 2004

1. We shall select our transport and warehousing providers and determine individual agreements impartially and based on factors such as economic rationality with consideration given to price, quality, supply stability, technological capabilities, reliability, and efforts to reduce environmental impact.
2. We shall be open in selecting our transport and warehousing providers, rather than relying exclusively on companies with which we have done business in the past or companies affiliated with Toray Group.
3. We shall comply with relevant laws and regulations, consider environmental preservation, and fulfil our corporate social responsibilities in outsourcing our transport and warehousing operations.
4. We shall cooperate with our transport and warehousing providers in gauging and reducing the environmental impact of our transport and warehousing operations.

Facilitating CSR Initiatives Throughout the Supply Chain

# Toray Group's Socially Responsible Procurement, Purchasing and Distribution

## Implementing Socially Responsible Procurement

### Number of group companies that have requested their suppliers to practice CSR

Reporting scope: Toray Group

Fiscal 2019 target:

40 or more



Result through end of fiscal 2017:

**127**

(Head Office: 1, Japan: 38, Outside Japan: 88)

Fiscal 2017 result: Outside Japan: 88

### Number of business partners that Toray Group companies have requested to practice CSR (cumulative)

Reporting scope: Toray Group

Fiscal 2017 target:

No annual numerical target



Result:

**3,170**

(Cumulative fiscal 2013-2017.

Fiscal 2017 result: 847)

The Toray Group is striving to strengthen the promotion of CSR in its supply chain for the Group overall, including at group companies around the world. By building a plan-do-check-action (PDCA) cycle, carrying out surveys to confirm current conditions, and requesting CSR measures, Toray is raising suppliers' awareness.

Toray views promoting CSR at overseas suppliers as one of its priority issues and carried out CSR surveys of 214 suppliers in fiscal 2017, targeting overseas group companies' processing suppliers.

In addition, group companies in Japan carry out CSR surveys of suppliers on an ongoing basis and surveyed 633 business partners in fiscal 2017 on their CSR status.



> [CSR Procurement Guidelines](#)

### Surveying Status of Socially Responsible Procurement at Toray Group Companies outside Japan

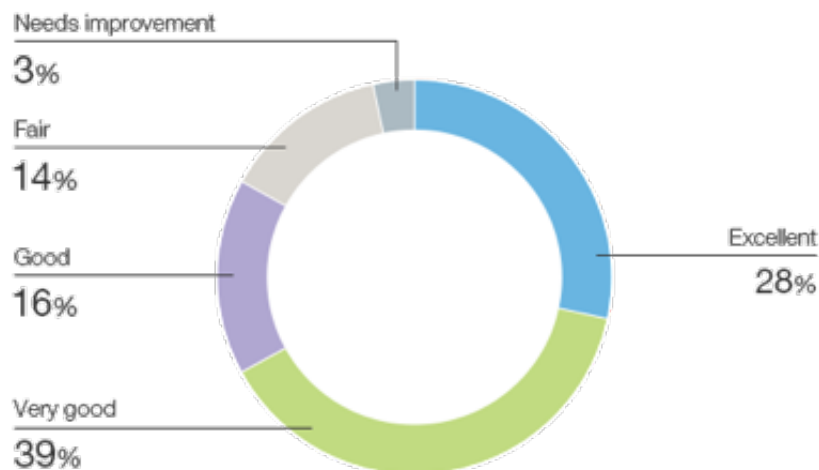
Ensuring that suppliers are also fulfilling their social responsibilities in the areas of labor conditions, safety and accident prevention, and environmental preservation has become increasingly important in recent years. In particular, determining the extent to which overseas suppliers are addressing CSR is a priority issue for the Toray Group and its global supply chain. To this end, in fiscal 2017 the processing suppliers at a total of 88 group companies outside Japan and their subsidiaries were given a CSR survey.

The results of the survey showed that these group companies worked with 214 processing suppliers. Of these, Toray has already requested that 126 introduce CSR practices. The survey showed that the Toray Group companies have not gone far enough in requesting CSR practices of the remaining 88 companies. Toray has carried out surveys of these 88 suppliers in accordance with the Group's CSR Procurement Guidelines and confirmed progress made with CSR.

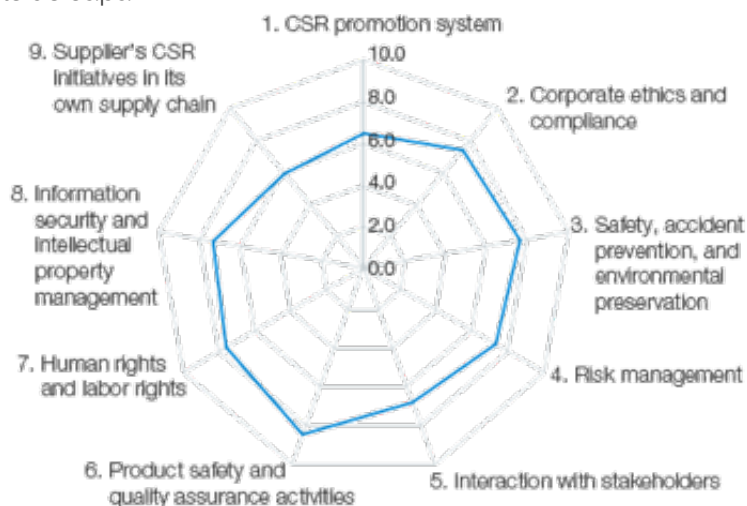
The survey results showed that 83% (73 companies) of the suppliers have initiatives in place that meet the Group's standards ("excellent," "very good" or "good") and additional surveys of actual conditions are required of 17% (15) companies ("fair" or "needs improvement").

While conveying the evaluation results to the companies, the companies that received "fair" or "needs improvement" assessments were also interviewed, visited, and asked to make improvements.

Fiscal 2017 CSR Status of Suppliers (Toray Group Companies outside Japan)



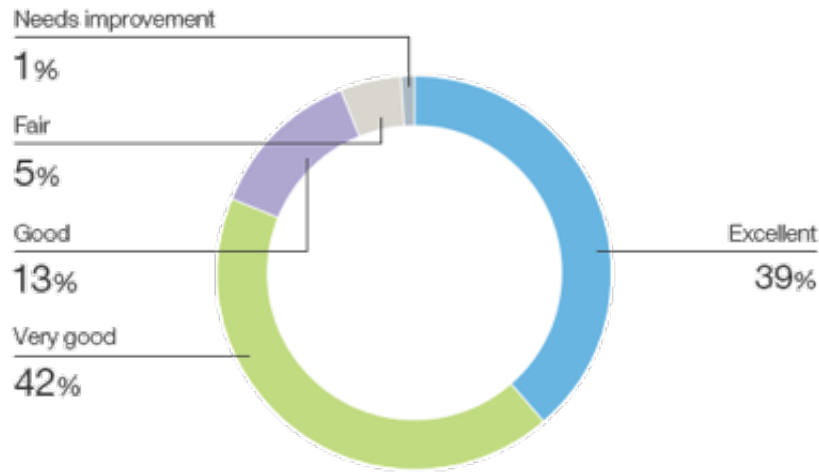
Fiscal 2017 Analysis of CSR Survey of Processing Suppliers outside Japan



**Socially Responsible Procurement Initiatives at Toray**

In fiscal 2016, major companies from which Toray procures and purchases products — companies from which it subcontracts production and sales and distribution companies which together are responsible for 90% of Toray's total procurement value — were surveyed. The results found that about 94% of companies surveyed were rated “excellent,” “very good” or “good” for CSR practices, thus meeting the Group's standards for business partners. Six percent of the companies surveyed rated only “fair” or “needs improvement,” requiring further investigation of their CSR practices. In fiscal 2017, all suppliers who had been rated “fair” or “needs improvement” were visited and their conditions assessed. Countermeasures for improvements were also discussed. The importance of CSR was reaffirmed with all companies. The Group will continue to strive to spread awareness of CSR throughout the supply chain and promote CSR activities.

## Fiscal 2016 CSR Status of Suppliers (Toray)



### Socially Responsible Procurement Initiatives at Group Companies in Japan

At Toray Group companies in Japan, there are internal systems and rules on promoting socially responsible procurement, and CSR surveys of suppliers are carried out. In fiscal 2017, a CSR survey was given to 633 suppliers. Among group companies in Japan, 1,940 suppliers were surveyed from fiscal 2013 through fiscal 2017.

### Socially Responsible Procurement Initiatives throughout the Supply Chain

In the CSR clause of its basic supplier agreement, Toray stipulates that both the Company and the supplier will pursue CSR activities in areas such as legal compliance, environmental conservation, respect for human rights and product safety. This ensures that socially responsible procurement initiatives are taken throughout the supply chain. Moreover, rules for responses to CSR surveys from customers are set and a system is used to facilitate prompt and accurate responses.

### Human Rights and Supply Chains

Toray Group's CSR Procurement Guidelines mandate a commitment to respect human rights in procurement. Toray also works with suppliers to promote human rights in supply chains.

- > [CSR Procurement Guidelines](#)
- > [Toray Group Policy for Human Rights](#)

## **Addressing Conflict Minerals**

The U.S. Securities and Exchange Commission (SEC) has issued rules requiring companies to disclose their use of conflict minerals. To comply with the rules, Toray investigates the use of conflict minerals in all products offered by the Toray Group, as part of its supply chain management. If conflict minerals are used, Toray investigates the suppliers to determine the mining operations and geographic source of the minerals.

## **International Cooperation in the Textiles and Apparel Industry**

The Toray Group is a member of the Sustainable Apparel Coalition, together with other apparel manufacturers and retailers from around the globe. The coalition is dedicated to reducing the environmental impact of apparel and footwear products, and improving human rights for workers.

**Facilitating CSR Initiatives Throughout the Supply Chain**

**Toray Group Distribution Initiatives**

Toray holds annual Basic Distribution Policy Briefings as part of its ongoing effort to improve quality and reduce the environmental impact of its distribution process. In 2017, distribution managers from 65 distribution partner companies and 17 Toray Group companies in Japan participated in briefings to promote understanding of Toray distribution policies and improve distribution performance.



Basic Distribution Policy Briefing

**Reducing the Environmental Impact of Distribution**

**Reduction in CO<sub>2</sub> emissions per unit of sales from distribution activities (year-on-year)**

Reporting scope: Toray Group (Only specified consigners in Japan)

Fiscal 2017 target:

**1.0%**



**Result:**

**1.0%**

The Toray Group is working hard to reduce CO<sub>2</sub> emissions in transport. These initiatives include reducing transport distances, shifting modes of transport to those which have less environmental impact such as sea and rail (modal shift), and raising transportation efficiency.

In fiscal 2017, at the Toray Group (only specified consigners<sup>1</sup> in Japan), CO<sub>2</sub> emissions from distribution activities were 39,800 tons, up 1,000 tons (2.5%) year-on-year, due primarily to an increase in transport volume. At the same time, the average energy consumption per unit of sales<sup>2</sup> decreased by 1.0 points over the previous fiscal year (using fiscal 2013 as the standard). This is equivalent to an approximately 2,000 ton reduction in CO<sub>2</sub> emissions.

In fiscal 2017, Toray's CO<sub>2</sub> emissions from distribution activities totaled 30,100 tons, up 500 tons (1.6%) over the previous fiscal year. The implementation of the modal shift, increased loading rates and reducing inefficient transport led to a 222 ton reduction, but overall emissions were higher due to the increased volume of product transport and the addition of the battery separator business.

Energy consumption per unit of net sales<sup>2</sup> decreased by 6.3% year-on-year and an average of 1.0% over the past five years, due to the abovementioned reasons and higher net sales. As a result, Toray is meeting its legal mandate as a specified consigner to reduce energy consumption intensity by an average of at least 1% every year over the medium-



and long-term.

The Toray Group will continue to seek CO<sub>2</sub> emissions reductions by pursuing environmentally responsible distribution.

1. Toray Industries, Inc., Dow Corning Toray Co., Ltd., Toray Advanced Film Co., Ltd., and Toray Amenity and Civil Engineering Co., Ltd., which have annual cargo transport totaling 30 million ton-kilometers or more, are “specified consigners” under Japanese law.

2. Energy consumption per unit of net sales refers to CO<sub>2</sub> emissions in transport divided by a transport-related index, as shown below:

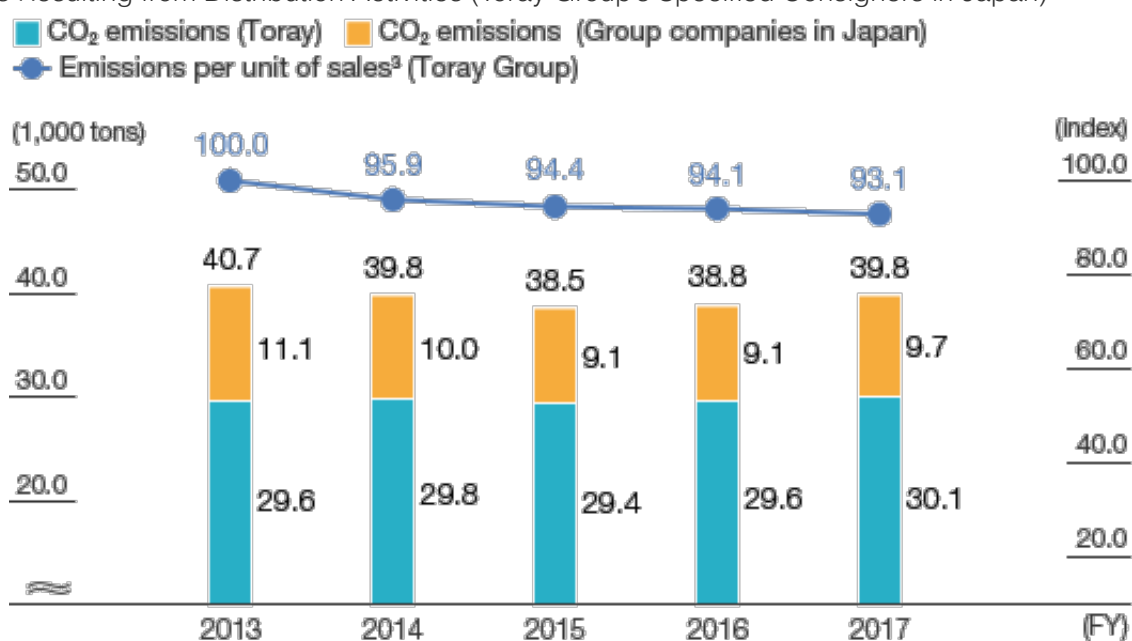
Toray Industries, Inc., Dow Corning Toray Co., Ltd. = Net sales

Toray Advanced Film Co., Ltd. = Shipping volume

Toray Amenity and Civil Engineering Co., Ltd. = Shipping volume x distance (per ton-kilometer)

Specified consigners are required to endeavor to meet the legal mandate to reduce energy consumption intensity by an average of at least 1% every year over the medium- and long-term.

CO<sub>2</sub> Emissions Resulting from Distribution Activities (Toray Group's Specified Consigners in Japan)



3. CO<sub>2</sub> emissions at the transport stage divided by sales on a per unit basis

## CO<sub>2</sub> Emissions Reduction in Distribution Activities (Toray)

Details of initiatives	CO <sub>2</sub> Reduction (1,000 tons)
Recognized actual reductions more precisely due to improved calculation accuracy for maximum loading capacities, average loading rates, and other values	0.04
Modal shift	0.06
Full-load transport (strategic positioning of warehouses, etc.)	0.07
Shortened transport distances (loading at the nearest port, etc.)	0.05
<b>Total</b>	<b>0.22</b>

# Promoting Environmentally Friendly Distribution by Changing Transport Vehicles

Toray has typically used dedicated vehicles called hopper cars to transport raw materials between plants. These vehicles can be used to transport large amounts of cargo at a single time, but the disadvantage is that small amounts of raw material remains in the tank, so to prevent mixing of materials, different raw materials cannot be transported on the outward and return trips. This means the hopper car is empty on the return journey.

To address this, Toray sought to reduce these wasted journeys by using pouches in which raw materials could be sealed. This resulted in a change to the vehicle itself, to a multi-purpose maritime container chassis and a 20-foot container with the use of a polyethylene pouch that is the same size as the container. This makes it possible to transport different materials on the outward and return trips without any mixing. In fiscal 2017, CO<sub>2</sub> emissions resulting from the transport of raw materials between plants were down by 28%. Toray will continue to work to reduce the environmental impact of distribution by improving load efficiency and other means.

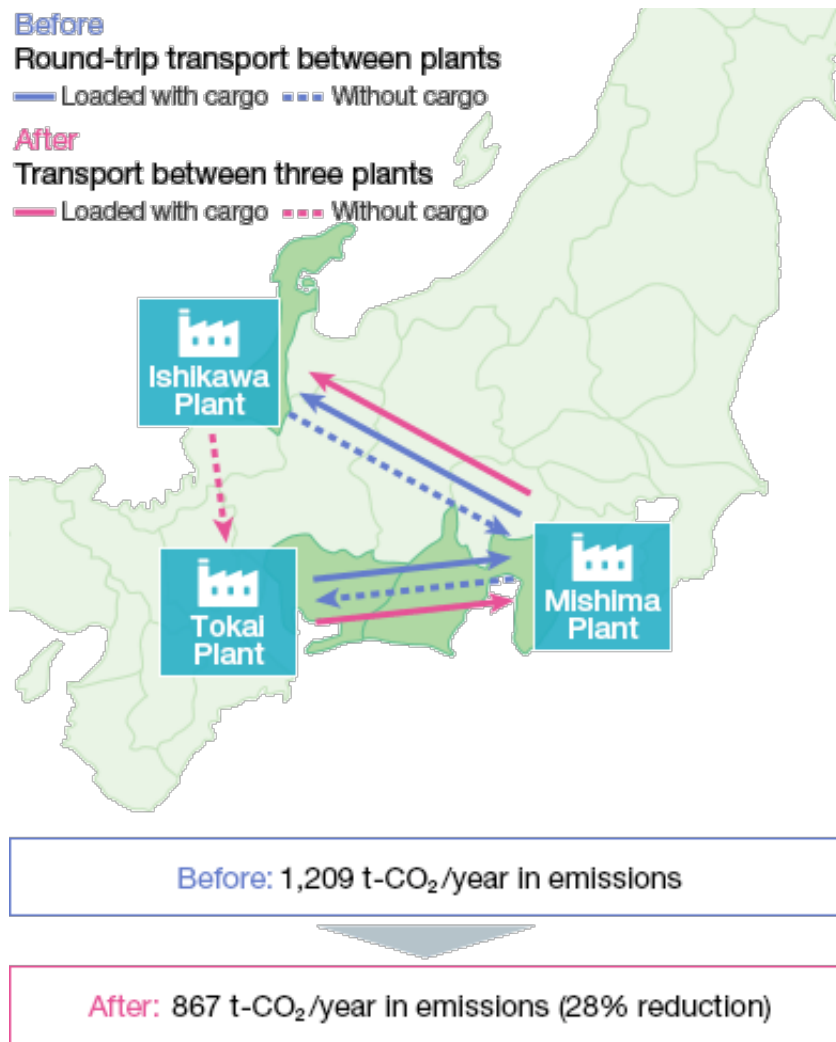


Previous hopper car



Container vehicle after switch

Change to transport of raw materials between plants



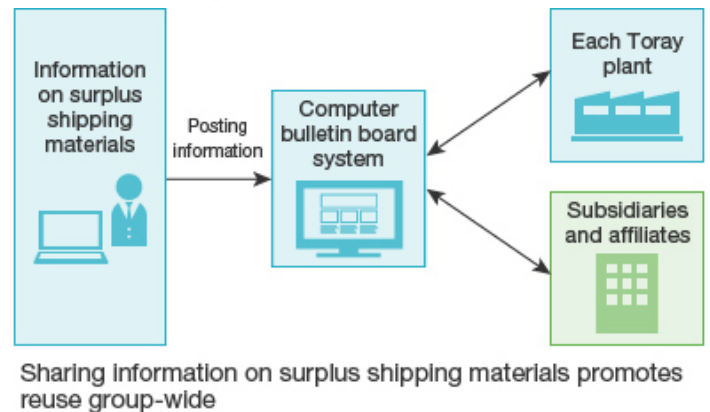
## Expanding Collection and Reuse of Packaging Materials

The Toray Group is establishing a global framework to collect and recycle packaging and shipping materials that are included with products used by customers. Group companies in Japan use an internal bulletin board to inform other companies if they have surplus packaging and shipping materials available for reuse.

Toray's System for Reusing Shipping Materials



Toray Group's Bulletin Board System for Sharing Surplus Shipping Materials



## Promoting a Modal Shift

### Modal shift to sea or rail for transport across distances for 500 km or more

Reporting scope: Toray

Fiscal 2019 target:

40%



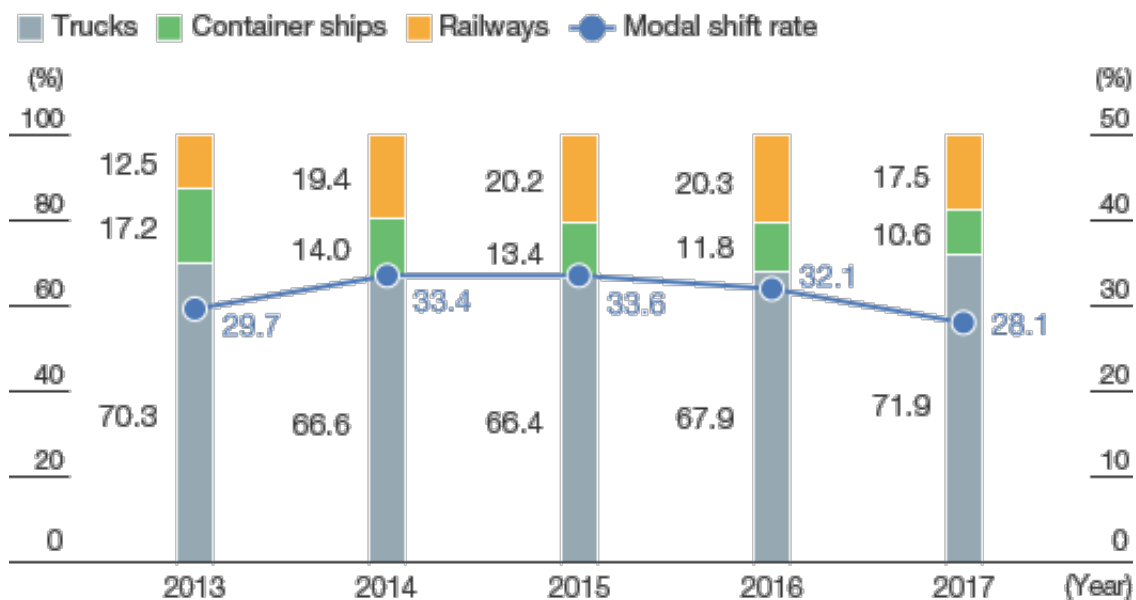
Fiscal 2017 result:

28%

Toray is striving to switch to rail and sea transport to achieve a modal shift target of 40% by fiscal 2019. The modal shift rate to sea or rail for transport in 2017 (January-December) was 28.1%, down 4.0 percentage points year-on-year, due to a reduction in the transport volume by rail and ship resulting from the change in distribution regions and an increase in truck transport due to increased sales volume of film products, which are difficult to transport by rail.

Toray will continue working to achieve a modal shift target of 40% by pursuing modal shifts in product and materials transport, and by working more closely with distribution partners. Through these efforts, Toray will promote environmentally responsible distribution while taking into consideration the environmental impact of the distribution process.

### Modal Shift to Sea or Rail for Transport (Toray)



## Acquisition of Eco Rail Mark and Eco Ship Mark

Toray has certified as an Eco Rail Mark Company by Japan's Ministry of Land, Infrastructure, Transport and Tourism and the Railway Freight Association. This recognizes Toray's active efforts to use rail freight transport, a relatively environmentally friendly means of transportation. The Company also obtained Eco Rail Mark Product certification for its TORAY TETORON™ fiber. In fiscal 2016, Toray acquired Eco Rail Mark Product certification for TORAYCON™ polybutylene terephthalate (PBT) resin. Moreover, in fiscal 2017 Toray achieved the Eco Ship Mark certification related to its film products, which are difficult to ship by rail. This program recognizes companies that are switching to ship transport and use maritime transport, which has a low environmental impact, to a certain extent.

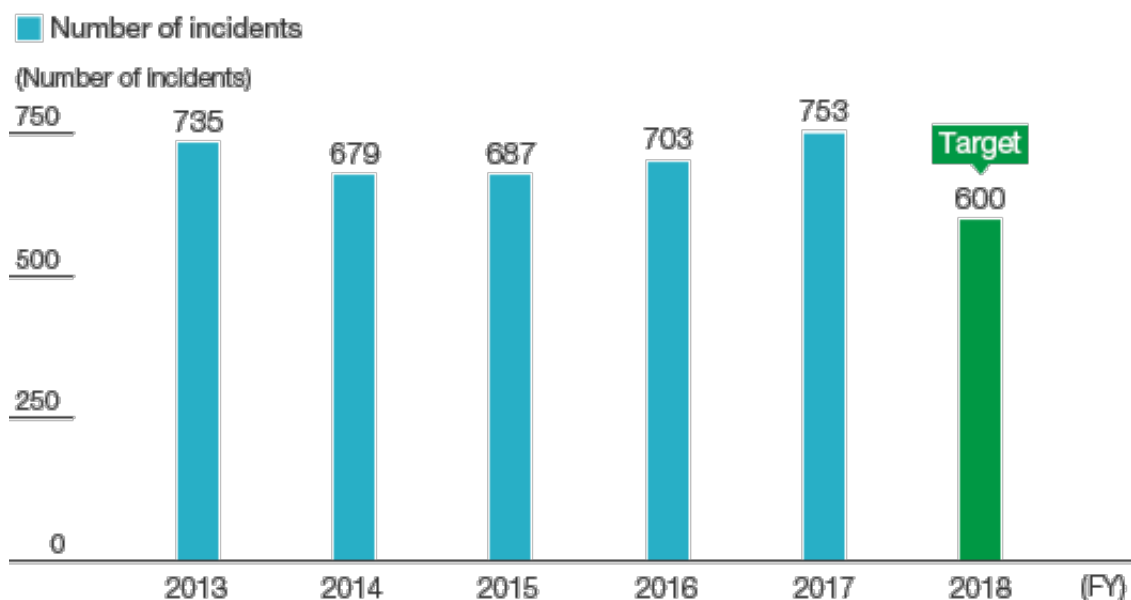


## Initiatives to Improve Safety and Quality in Distribution

Toray is working on a project to improve transport quality. The project involves sharing accident analysis data, distribution quality enhancement reports, and distribution accident hazard prediction training. Partners that make outstanding contributions to improving quality are recognized through annual awards.<sup>4</sup> These initiatives are aimed at reducing the number of problems such as those involving breakage, and reducing transport delays and incorrect shipments of Toray products. Toray works with distribution partners to improve distribution quality and safety and to reduce the incidence of problems by conducting on-site inspections and holding quality control meetings with partners.

4. Distribution-partner companies receiving awards in fiscal 2017 (alphabetical order): Daisei Warehousing & Transportation Co., Ltd., Kusatsu Soko Co., Ltd., Masuda Transportation Co., Ltd., Okayamaken Freight Transportation Co., Ltd., Shikoku Meitetsu Transportation Co., Ltd., Toyo Logistic Service Co., Ltd.

## Distribution Incidents



Shipments of resin products, which account for 60 to 70% of all incidents, increased by 10% year-on-year. This is because these products are prone to damage caused by manual transshipment. There was a sharp rise in accidents during transport due to changes in the transport environment, with the overall number of incidents up by 50 (7%) over the previous year. Toray will continue working with partner companies to improve distribution quality.

### Recommending that Distribution Partners Acquire Third Party Certification

Toray recommends that its distribution partner acquire external certifications such as ISO 9001, ISO 14001, Green Management Certification,<sup>5</sup> and G Mark.<sup>6</sup> These certifications require companies to achieve legal compliance, improve quality, and practice environmental conservation in distribution processes. Toray also pursues CSR initiatives in collaboration with distribution partners.

5. Green Management Certification is awarded to companies that demonstrate a certain level of environmental improvement activities based on a manual for implementing green management (business management with a low environmental impact).
6. The G Mark is awarded to companies that meet certain criteria and demonstrate excellent safety, based on an assessment of proactive initiatives for legal compliance and safety.

### Yellow Card Emergency Response Measures

Drivers of shipping vehicles carry a yellow card<sup>7</sup> detailing emergency measures to be taken to minimize damage in the event of an accident. Toray has also established an emergency communication system and carries out emergency training. In the unlikely event of such an accident, Toray has procedures in place enabling the necessary staff to be dispatched as swiftly as possible to the accident site for assistance.

7. Cards summarizing the names of any hazardous substances, applicable laws and regulations, hazardous properties, emergency accident procedures, emergency reporting and contact information, methods for minimizing the spread of damage, and other accident response information.

## Initiatives to Prevent Overloading

The overloading of trucks causes vibration, noise, damage to roads and facilities, and also creates driving hazards. Consequently, Toray is putting considerable effort into the prevention of overloading.

## Compliance and Security Measures for Importing and Exporting

As a measure to ensure the legality and safety of imports and exports as part of Toray Group's expanding global operations, a US subsidiary of Toray International, Inc. enrolled in the Customs-Trade Partnership Against Terrorism (C-TPAT)<sup>8</sup> with the aim of strengthening global supply chain compliance. In order to realize more efficient imports and exports of materials and to strengthen supply chain compliance and security measures, Toray is also encouraging its worldwide distribution partners to obtain Authorized Economic Operator (AEO)<sup>9</sup> status.

8. A voluntary program introduced by United States Customs and Border Protection in November 2004. The aim of the program is ensure and strengthen security through the global supply chain, based on international cooperation with private operators importing goods into the US.
9. A status implemented by the EU in December 2006 that gives priority in customs procedures to importers and exporters with a high level of compliance for cargo security. The Japanese Customs Act was also revised in 2007, and a similar qualification system was established to provide priority in customs procedures to highly compliant operators.

## Communication

Disclose corporate information in an active, fair and straightforward manner, and encourage dialogue and cooperation with stakeholders including employees, stockholders, investors, business partners, consumers, local communities, non-profit organizations, government and administrative agencies, mass media, analysts, and other parties.

## Policy and Framework

### Sixth CSR Road Map Goals

1. Promote dialogue and collaboration with stakeholders in accordance with the Basic Policies to Promote Dialogue with Stakeholders
2. Reflect results of dialogue and collaboration with each stakeholder group in management activities in a timely and appropriate manner

### Management

The Toray Group communicates with diverse stakeholders throughout its business activities in accordance with its Basic Policies to Promote Dialogue with Stakeholders. The senior management team regularly receives reports on communication activities and provides advice.

### Basic Policies to Promote Dialogue with Stakeholders Adopted September 2005

1. Toray Group will promote dialogue and collaboration with all stakeholders, including customers, stockholders and investors, business partners, employees, government, local communities, NPOs, citizens, the global community and the media.
2. Each company in Toray Group, through dialogue and collaboration with stakeholders, will take steps to carry out reforms designed to increase the satisfaction level of everyone.
3. All Toray Group employees, in their respective workplaces, shall identify and strive to solve issues affecting stakeholder satisfaction as part of their CSR activities.



Communication

# Communication via Corporate Websites

## Number of corporate website page views (per month)

Reporting scope: Toray Group

Fiscal 2017 target:  
**1.5** million page views

**Result:**  
**1.55** million page views

## Group companies that have their own websites (%)

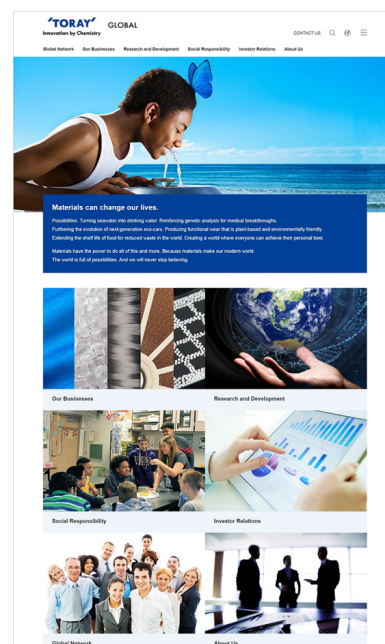
Reporting scope: Toray Group

Note: Group companies covered by the Toray Website Global Guidelines

Fiscal 2017 target:  
Japan **70%**  
Outside Japan **100%**

**Result:**  
Japan **80%**  
Outside Japan **100%**

On the Toray Group website, information is provided to a wide range of stakeholders to give them an accurate perspective on Toray, with information in menu categories such as “About Us,” “Our Businesses,” “Research and Development,” “Social Responsibility” and “Investor Relations.” In fiscal 2017, the Toray Website Global Guidelines were revised from the standpoint of usability and the appeal of the corporate brand and to conform to the latest website trends, and the Toray corporate site went through a comprehensive update. Going forward, the Toray Group will apply the latest guidelines to the portal sites of countries/regions and the website of group companies, one by one. The Group will continue to standardize the tone and manner of its websites and improve usability.



Toray's global website now offers sites translated for 11 countries/regions

## ■ Communication

# Communication with Customers

### Customer Satisfaction Survey

True to its “customer first” commitments, the Toray Group conducts customer satisfaction surveys every three years. The survey conducted in January 2017 received responses from some 300 customer companies in and outside Japan, similar to the previous survey in 2014. It yielded considerable useful feedback, including some requests not heard in usual customer interactions. The survey results are shared within the Company at the Board of Directors meeting and via the in-house newsletter. Subsequently, members of the office which carries out the survey analyze the results, looking at customers’ assessments and issues to be addressed by division/department, and then provide the individual results to each workplace. From officers and managers to general staff, every employee works to achieve even higher quality customer service, by engaging in an iterative cycle of understanding and improving issues.

**Communication**

## Communication with Stockholders and Investors

In accordance with its Information Disclosure Policy, Toray makes sure to disclose information required under laws and regulations in an accurate, timely and appropriate manner, as well as a broad range of additional information beyond these requirements. Toray's Investor Relations Department was established directly under the president to liaise with stockholders and investors, aiming to create as many communication opportunities as possible.

### Number of responses to investor inquiries

Reporting scope: Toray

Fiscal 2017 target:  
No annual numerical target



**Result:**  
**676**

### Holding Investor Relations Events to Meet Directly with Stockholders and Investors

Toray conducts same-day briefing sessions for institutional investors and securities analysts to coincide with the release of quarterly and annual earnings results, and fields interview requests from the media. The table below summarizes the main investor relations activities that were conducted in fiscal 2016. Feedback received at investor briefing sessions and through communication with investors and stockholders is regularly reported to the Board of Directors and Corporate Communications Committee, helping to guide management and business activities.

Activities	Attendees from Toray	Number of events	Number of participants/frequency
Briefings on business results announcements	President, vice president responsible for investor relations, and vice president responsible for finance and accounting	4 times/year	549
Meetings and conference calls with investors and analysts	Vice president responsible for investor relations, General Manager of the Investor Relations Department	As required	676

## External Evaluation of Information Disclosure to Investors

In the "Investor Relations" section of its corporate website, Toray provides information about its financial results and management policies and strategies for stockholders and investors. In an effort to disclose information fairly, Toray promptly posts financial data and presentation materials, including English translations, used in its briefings for institutional investors. In fiscal 2017, Toray's publications were evaluated externally by a number of organizations, as shown below.

Organization details	Evaluations
Daiwa Investor Relations Co., Ltd.	Awards for outstanding websites in 2017
Nikko Investor Relations Co., Ltd.	Most outstanding site in overall completeness, in a ranking of listed company websites in 2017

## Evaluations from the Perspective of Socially Responsible Investment

Toray was included in the following SRI indices as of March 31, 2018.

- Dow Jones Sustainability Index Asia Pacific
- MSCI Global Climate Index
- Ethibel Pioneer & Excellence Registers
- Morningstar Socially Responsible Investment Index (MS-SRI)
- Sompo Japan Nipponkoa Asset Management (SNAM) Sustainability Index

## Convenient General Stockholders Meetings

For the convenience of its stockholders, Toray avoids holding its general meeting of stockholders on a date when many other companies in Japan hold their meetings. Toray also sends out notices of its general meetings of stockholders as early as possible to give sufficient time for stockholders to plan their attendance. In fiscal 2017, 642 stockholders attended the Company's ordinary general meeting of stockholders.

■ Communication

## Communication with Business Partners

The Toray Group holds policy briefings and carries out CSR procurement surveys for business partners to foster mutual understanding and closer collaboration.

## Communication

# Communication with Employees

### Communication via In-house Newsletters and Intranet

The Toray Group employs various forms of media such as printed in-house newsletters, intranet, and company-wide bulletin boards to stimulate communication among employees. Messages from the company president appear in all of these media. The in-house newsletter is published in three languages (Japanese, English, and Chinese) to keep employees informed about management and business topics as well as corporate projects.

In January 2017, the Group launched an intranet called TORAYNAVI Lite in Japanese and English for group companies in and outside Japan as a global information sharing infrastructure. Going forward, Toray will promote the use of the intranet at each group company and identify the needs of employees and other matters in periodic questionnaire surveys in order to further enhance the content.

#### Circulation of Toray Group's publications

**Japanese edition of *People* in-house newsletter:**

Around 15,000 copies per issue (published six times per year)

**English edition of *People* in-house newsletter:**

Around 3,000 copies per issue (published four times per year)

**Chinese edition of *People* in-house newsletter:**

Around 6,000 copies per issue (published four times per year)

***Toray Management* newsletter for managers:**

About 6,000 copies per issue (published four times per year)



### Employee Attitude Survey

Toray conducts an employee attitude survey every three years, in the same time frame as the customer satisfaction survey. Targeting employees including those assigned to Group companies in Japan, the survey gauges the level of employee engagement, implementation of the medium-term management program, motivation level of employees, and workplace conditions. The survey results are used to identify gaps that may exist between employee attitudes and customer assessments from customer satisfaction surveys, and analyze the level of communication between managers and staff. The results of the employee attitude survey are circulated within the company as feedback and are utilized to make improvements.

In addition, in fiscal 2017, a similar survey was conducted in five languages for employees of group companies outside Japan.

## Meetings with Employees and Labor Unions

### Number of meetings with employees or labor unions

Reporting scope: Toray Group

Fiscal 2017 target:  
No annual numerical target



**Result:**

**14**

Communication

## Communication with the Media

### Number of news releases

Reporting scope: Toray Group

Fiscal 2017 target:

200



Result:

**187**

Toray recognizes that public relations and corporate communication activities have a role in fulfilling responsibilities for information disclosure as well as influencing public opinion. Accordingly, Toray's Corporate Communications Department actively engages with a wide range of media organizations, linking the Company with the public. Based on Toray's Information Disclosure Principles, the department provides fair and impartial information, even if it may cast the Company in a bad light, in a timely and appropriate manner. In fiscal 2017, Toray issued 187 press releases and carried out 318 interviews in response to media requests.



Communication

# Communication with Local Communities

## Number of meetings with communities

Reporting scope: Toray Group

Fiscal 2017 target:  
No annual numerical target



**Result: 65**

The Toray Group creates a variety of opportunities for communication with nearby residents. Some examples of these activities include regular community meetings with local residents, participation in events sponsored by local governments, and inviting local residents to summer festivals held on plant premises. The Group also collaborates with non-profits on community programs.



Toray Group in Malaysia taking part in a softball tournament organized by the local Japanese community



Community meeting with local government leaders at Toray's Okazaki Plant



Summer festival at Toray's Shiga Plant with a crowd of about 2,500, including employees, their families, and local residents



Company orientation and plant tour for local students organized by Toray Textiles Central Europe s.r.o.



Soda Aromatic Co., Ltd. holds a make-your-own-perfume event for local elementary and junior high school students.

## Social Contribution Activities

**Proactively participate in local communities and the larger society in order to contribute to development in a way befitting a good corporate citizen.**

## Policy and Framework

### Sixth CSR Road Map Goal

Pursue ongoing social initiatives throughout the Toray Group in the priority areas of “science and technology promotion,” “environment and communities,” and “health and welfare.”

### Management

As the foundation of its business activities, the Toray Group works to build ties with local communities and contribute to society through its core businesses. Embracing a corporate philosophy of contributing to society as the ultimate objective of its corporate activities, Toray has worked to foster social development since its founding. The Group’s Corporate Missions were set out in 1995 and include “For society: To establish ties and develop mutual trust as a responsible corporate citizen.”

Social contribution activities were included in the Toray Group’s CSR Guidelines established in 2004, and these activities have been a part of the Group’s CSR activities ever since.

Under the Sixth CSR Road Map, the Group is focused on social issues addressed by the United Nations Sustainable Development Goals (SDGs)<sup>1</sup> and the Green Innovation and Life Innovation businesses under the medium-term management program, Project AP-G 2019. The Group has set targets in several priority areas, namely science and technology promotion, environment and communities, and health and welfare. The Toray Group will maintain its scale of social contribution activities over the long term and focus particularly on providing educational support to train the human resources needed to achieve a sustainable society. The Group’s goal is to provide a total of 100,000 people with educational support, including science and environmental education addressing the topics of water and climate change, between fiscal 2014 and fiscal 2020.

1. The Sustainable Development Goals (SDGs) were adopted in September 2015 at the UN Sustainable Development Summit attended by more than 150 Heads of State. These 17 goals and 169 targets are worldwide objectives to be reached by 2030.

## Toray Group Social Initiative Policies Adopted May 2005

1. Based on its Corporate Philosophy of "Contributing to society through the creation of new value with innovative ideas, technologies, and products," we will contribute to sustainable development of local and global society as a good corporate citizen, while continuously supporting social initiatives among employees.
2. We will pursue original programs dedicated to the improvement of social welfare in local communities, international exchange through traditional culture, sports promotion, and especially the advancement of science.
3. Using company awards and other measures, we will create a culture that encourages employees to participate in society in constructive ways such as engaging in voluntary activities with an eye to local needs.
4. We will examine all marketing and advertising activities from the perspective of social contribution before finalizing them.
5. We will contribute funds amounting to about 1% of our consolidated ordinary income to social initiatives.

### Priority Areas for Social Contribution



**Science and  
Technology  
Promotion**



**Environment  
and Communities**

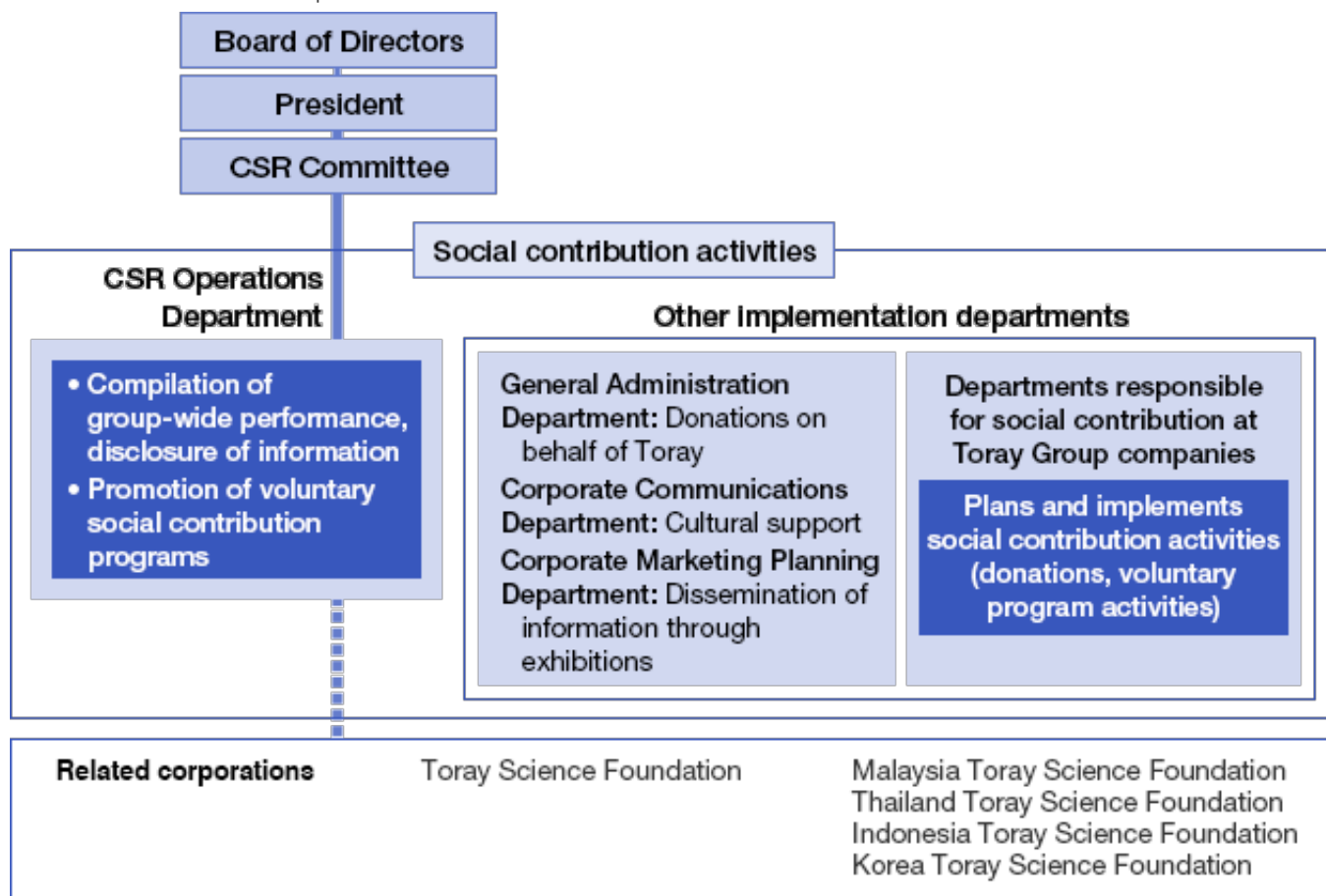


**Health and  
Welfare**

## Framework

Since April 2012, Toray has positioned the CSR Operations Department as a specialized department focusing on social contribution activities. The department is responsible for planning and promoting its own voluntary programs implemented independently, as well as aggregating CSR performance across the Toray Group. Policy related to CSR activities and major CSR initiatives are discussed by the CSR Committee. Policy is communicated to Toray Group sites in and outside Japan through “CSR line activities” designed to resolve CSR issues in specific workplaces, as well as meetings attended by representatives from each country where the Group operates outside Japan, in order to promote activities that are suitable for the particular circumstances of each country and company.

Social Contribution Activities Operational Structure



## Social Contribution Activities

# Fiscal 2017 Results

### Social contribution expenditure (% compared with fiscal 2011–2016 average)

Reporting scope: Toray Group

Fiscal 2017 target:

100%



Result:

**126%**

### Number of persons reached through educational initiatives in these key fields

Reporting scope: Toray Group

Fiscal 2017 target:

15,000 or more

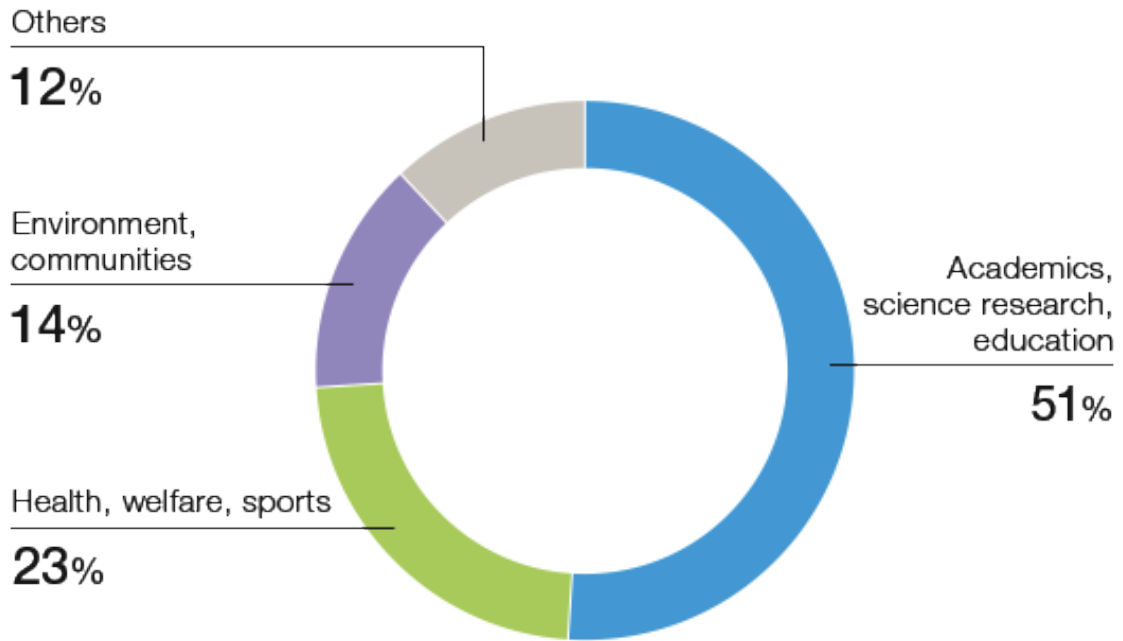


Result:

**16,709**

As a member of the 1% Club, an organization founded in 1990 by Nippon Keidanren (Japan Business Federation), Toray has pledged to invest about 1% of its consolidated ordinary income into social contribution activities. In fiscal 2017 the Group invested some 1.7 billion yen on a consolidated basis (1.1% of consolidated ordinary income) and some 1.1 billion yen on a non-consolidated basis (1.2% of non-consolidated ordinary income), to achieve the one percent target. The main beneficiaries were the Toray Science Foundation in Japan, the Toray science foundations in Malaysia, Thailand, Indonesia, and the Republic of Korea, and sponsorship of the Shanghai International Marathon. In fiscal 2017, Toray, on behalf of the Toray Group, donated approximately 220 million yen to the Toray Science Foundation. Toray Group companies outside Japan donated approximately 140 million yen to Toray science foundations around the world.

Breakdown of Expenditure in Fiscal 2017



Note: Categories of contribution fields were changed in fiscal 2017.

## Social Contribution Activities

Priority Areas



# Science and Technology Promotion

In its long-term corporate vision, the Toray Group has outlined a corporate philosophy of “contributing to society through the creation of new value with innovative ideas, technologies and products,” which the Group delivers on by practicing innovation. In order to continuously deliver innovation, the Group must secure and develop talented human resources. From the long-term perspective, the Group fosters human development by providing research grants and supports science education through the Toray Science Foundation and Toray science foundations outside Japan, to raise interest in science.

### Related Information

> [Toray Science Foundations around the World](#)

## Supporting Science in the Classroom

Since 2007, the Toray Group has been sending employees to teach in science classes at elementary and junior high schools in local communities. As part of an effort to familiarize children with science, Toray has developed a science workshop program utilizing its products as educational materials. The workshops are taught in a number of countries with a curriculum developed in Japanese, English, and Thai. The Group also supplies teachers with teaching materials free of charge and collaborates on teacher training, as well.

In fiscal 2017, the Group sent employees to teach science classes at a total of 16 schools in the United States, Thailand, and Japan (for a total of 44 schools when combined with the Group's environmental classes). The Toray Group also supplied lab equipment and teaching materials to 62 schools across Japan and cooperated on teacher training in Tokyo.

### Related Information

> [Environmental Education Program for Elementary and Junior High School Students](#)





Science class conducted by Thai Toray Synthetics Co., Ltd.



Program conducted at school supplied with teaching materials by Toray

### Collaborating on Science Events

In response to requests from local communities, the Toray Group participates in and collaborates on a variety of activities designed to increase interest in science, technology, and manufacturing.

## Summer Riko-challe<sup>1</sup> 2017 Science Event Sponsored by Toray



High school girls get firsthand research experience (Toray Research Center, Global Environment Research Laboratories, Toray Industries).



Elementary and junior high school girls create original perfumes (Koriyama Plant, Soda Aromatic Co., Ltd.).

1. Riko-challe is an initiative established by the Gender Equality Bureau division of the Japanese Cabinet Office to provide support for junior high and high school girls who are interested in science and engineering, designed to help them envision their future and choose career paths in those fields.

### Related Information

> [Toray Summer Riko-challe 2018 Research Workshop Course \(Japanese site\)](#)



Special science lecture in Japanese language classroom in St. Louis (Zoltek Corporation)



On-the-job interview by junior high school students researching carbon fiber (Toray Head Office)

## Workshops at the Science Museum

Since 2012, Toray has conducted workshops at the Science Museum located in Kitanomaru Park in Tokyo, every day that the museum is open. In fiscal 2017, more than 7,000 people ranging from young children to adults attended the two workshops, which examined filtration and the importance of water, and the amazing properties of fibers.

## Sponsoring the Japan Biology Olympiad

Since 2007, Toray has supported Japanese senior high school students to attend the International Biology Olympiad through arrangements made by the Japan Science Foundation. Four Japanese students attended the 28th Olympiad held in UK in July 2017, winning silver medals.



Four students from Japan (photo courtesy of Organization of Japan Biology Olympiad Committee)

## Held Aozora Science School


In 2015, Toray started the Aozora Science School<sup>2</sup> to foster youth interest in science through exposure to nature. The programming changes every year to provide campers with a fun menu of activities that combine nature and science. The activities included a campfire that changes color through flame reaction, filtering lake water to remove impurities, stargazing, and making rockets.



Campers get to launch the rockets they made at the rocket competition.

2. Aozora Science School is a hands-on educational camp designed by Toray Industries, supervised by Leave a Nest Co., Ltd. and provided by JTB Corporation.

## Related Information

- > [Aozora Science School official website \(Japanese site\)](#)
- > [Aozora Science School Facebook page \(Japanese site\)](#) 

## Social Contribution Activities

# Toray Science Foundations around the World

## Toray Science Foundation

The Toyo Rayon Science Foundation (now called the Toray Science Foundation) was established in 1960 to commemorate the 35th anniversary of Toray's founding. Toray contributed 1 billion yen when it was established, and has continued to donate funds to cover operating costs through the present.

The Foundation was much talked about when it was first established as a pioneering corporate foundation. Its support activities such as grants and prizes for basic science have continued to win high praise. Five<sup>1</sup> of the recipients of the Foundation's Science and Technology Prizes or Science and Technology Grants have gone on to win Nobel Prizes.

1. Reona Esaki (recipient of the Foundation's Science and Technology Prize in 1961 and the Nobel Prize in Physics in 1973), Ryoji Noyori (recipient of the Foundation's Science and Technology Prize in 1990 and the Nobel Prize in Chemistry in 2001), Isamu Akasaki (recipient of the Foundation's Science and Technology Prize in 2000 and the Nobel Prize in Physics in 2014), Shinya Yamanaka (recipient of the Foundation's Science and Technology Grant in 2004 and the Nobel Prize for Physiology or Medicine in 2012,) and Tasuku Honjo (recipient of the Foundation's Science and Technology Grant in 1981 and the Nobel Prize for Physiology or Medicine in 2018).

## Main activities of the Toray Science Foundation <sup>2</sup>

- (1) Toray Science and Technology Grant: The Toray Science and Technology Grant provides financial assistance to young researchers engaged in exploratory research in science and technology.
- (2) Toray Science and Technology Prize: The Toray Science and Technology Prize is awarded to scientists for their distinguished achievements in science and technology.
- (3) Toray Science Education Prize: The Toray Science Education Prize is an award to commend junior and senior high school teachers who have given creative and innovative lessons in science with good results. The Ministry of Education, Culture, Sports, Science and Technology backed the program in fiscal 2006 by establishing the Minister of Education, Culture, Sports, Science and Technology Prize. The Foundation publishes a booklet collecting the description of the prizewinner's works and circulates about 16,000 copies of it to junior and senior high schools every year for teachers to use.
- (4) Toray Science Foundation International Research Grant: This grant is awarded to young researchers engaged in basic research in the natural sciences in Indonesia, Malaysia, and Thailand.

2. The prize and grant recipients are selected by a third-party committee made up of experts.

## Cumulative achievements, fiscal 1960-2017

Category	Number awarded	Amount(million yen)
Toray Science and Technology Grant	637	6,625
Toray Science and Technology Prize	121	448
Toray Science Education Prize	674	209
Japan total	1,432	7,282
Grants for researchers outside Japan <sup>3</sup>	695	428
Total	2,127	7,710

3. Including direct grants to universities in 1989-1993 (61 cases, totaling 68 million yen)

### 58th Toray Science Foundation Presentation Ceremony

The 58th Toray Science Foundation Presentation Ceremony was held in March 2018. The Foundation awarded Hiroshi Hamada and Kaoru Inokuchi the Toray Science and Technology Prize, and science teachers the Science Education Prize, and all received certificates, medals, and prize money. Also given was a total of 130 million yen in grants to recipients of the Science and Technology Grants.



Dr. Hiroshi Hamada, recipient of the Toray Science and Technology Prize (right)



Dr. Kaoru Inokuchi, recipient of the Toray Science and Technology Prize (right)



Toray Science and Technology Grant recipients at 58th presentation ceremony

## Related Information

> [Toray Science Foundation](#) 

### Toray Science Foundations outside Japan

Toray has established science foundations in three Southeast Asian nations where it has started businesses since the 1960s. These foundations aim to contribute to the advancement of science and technology and promote science education in each country. The science foundations in Malaysia and Indonesia were established in 1993, followed by the establishment of a foundation in Thailand in 1994.

Since their establishment, the foundations have provided awards for outstanding achievements in science, technology and science education, and grants for research in the natural sciences, using funds raised by interest income from endowments, grants from the Toray Science Foundation, and annual donations from group companies in various countries. The award winners and grant recipients include outstanding science researchers, young researchers in the basic sciences, and science educators. These activities have earned great social respect in the countries of each foundation. In January 2018, Toray established the Korea Toray Science Foundation.

The foundations seek to support the medium- and long-term development of science and technology in the host countries, by generating interest among science and technology researchers, youth, and science educators. The foundations also contribute to mutual understanding, friendship, and goodwill between Japan and each country, and foster economic development there, as well.

#### Malaysia Toray Science Foundation (MTSF)

Since its inauguration in August 1993, MTSF has extended awards and grants totaling 9.88 million ringgit to 715 researchers and science teachers. MTSF holds an annual award presentation ceremony that is attended by the Minister of Science, Technology and Innovation of Malaysia and the Japanese ambassador to Malaysia. The awards are a badge of honor for the award winners and grant recipients.

The 24th Malaysia Toray Science Foundation Award Ceremony was held in December 2017, and a total of 410,000 ringgit in prize money (equivalent to about 11 million yen) and grants were awarded to two Malaysian scientists, 13 young researchers and 15 science teachers (total of 30 recipients). The Minister of Science, Technology and Innovation expressed his appreciation to the Toray Group for giving Malaysian scientists inspiration and making significant contributions to the development of science and technology in Malaysia since MTSF was founded in 1993.



24th presentation ceremony of the Malaysia Toray Science Foundation with Science and Technology Prize winners

### Related Information

> [Malaysia Toray Science Foundation](#) 

## Thailand Toray Science Foundation (TTSF)

Since its inauguration in June 1994, TTSF has extended awards and grants totaling 124.0 million baht to 686 researchers and science teachers. TTSF holds an annual award presentation ceremony. From the inaugural ceremony in 1995 through 2009, the ceremony has been attended by President of the Privy Council His Excellency General Prem Tinsulanonda, and since 2010 has been attended by the Privy Councillor His Excellency General Surayud Chulanont. The ceremony is always a big moment for award and grant winners.

The 24th Thailand Toray Science Foundation Award Presentation Ceremony was held in Bangkok in March 2018, and two Science and Technology Awards, 20 Science and Technology Research Grants and 12 Science Education Awards were presented to the winners, for a total of 5.48 million baht (equivalent to about 18.7 million yen) in prize money and grants. Akihiro Nikkaku, President of Toray, gave an address and congratulated all the recipients.



24th presentation ceremony of the Thailand Toray Science Foundation with Science and Technology Award winners



Toray President Akihiro Nikkaku speaks at the presentation ceremony

## Related Information

> [Thailand Toray Science Foundation](#) 

## Indonesia Toray Science Foundation (ITSF)

From the beginning, ITSF has enlisted the cooperation of the Indonesian Institute of Sciences, whose Director-General also chairs the Foundation. Since its inauguration in December 1993, ITSF has extended awards and grants totaling 20.2 billion rupiah to 687 researchers and science teachers. ITSF has assisted many individuals who are contributing to the progress of science and technology in Indonesia. Many of the past recipients of research grants now teach as professors and associate professors at leading universities, including the University of Indonesia, Bandung Institute of Technology, Gadjah Mada University, and Sekolah Tinggi Teknik Surabaya, and others conduct research at the Indonesian Institute of Sciences.

The 24th presentation ceremony of the Indonesia Toray Science Foundation was held in Jakarta in March 2018; 18 scientists were awarded the Science and Technology Research Grant and 10 science teachers received the Science Education Award, for a total of 995.8 million rupia (equivalent to about 8.3 million yen).

On the day before the ceremony, a briefing session by the winners of the fiscal 2016 grants was held along with a science education seminar. In the seminar, two education specialists delivered lectures and the 10 recipients of this year's Science Education Award gave presentations.



24th presentation ceremony of the Indonesia Toray Science Foundation with grant recipients, prize winners and guests

## Related Information

> [Indonesia Toray Science Foundation](#) 



## Korea Toray Science Foundation (KTSF)

In 2018, the 55th anniversary of the start of the Toray Group's business operations in the Republic of Korea, KTSF was established on January 17 as a public interest incorporated foundation with approval from the Ministry of Science, ICT and Future Planning. KTSF began accepting applications for Technology and Science Prizes and Grants on its website in April 2018, with the aim of contributing to the development of science and technology in the Republic of Korea. In addition, KTSF plans to pursue programs that foster the next generation of scientists with scholarships and other initiatives.



KTSF management and a team from the Toray Group in the Republic of Korea (at the office opened in February 2018)

### Related Information

> [Korea Toray Science Foundation](#) 

## Social Contribution Activities

Priority Areas



# Environment and Communities

The Toray Group leverages the specialized technologies and human resources of its Green Innovation businesses to support environmental education. The Group is also working with community stakeholders on environmental preservation activities to encourage social efforts to foster biodiversity.

### Raising Environmental Awareness, with a Focus on Water Issues

The Toray Group has developed original environmental education programs for elementary and junior high school students. Group employees from diverse professional backgrounds including engineering, research, sales, and management give workshops. In fiscal 2017, the Group offered workshops at 28 schools in local communities. In December 2017, the Group gave a workshop for first-year students at Rakunan Junior High School in Kyoto. One student commented, "It's hard to see when you are in Japan, but the water shortage continues around the world. I also want to do research that will help solve global problems, so I want to focus on technology and science in particular."



Toray Global Environment Research Laboratories researcher gives a lecture

### Local Environmental Preservation Activities

In addition to activities focused on preserving the natural environment around Toray Group production sites, employees also take part in river and coastline cleanup and tree planting campaigns in collaboration with municipalities, towns, villages, and non-profit organizations. The Group helps promote employee understanding of environmental issues by including talks by non-profit organizations in conjunction with these activities.



Greenbelt on the premises of the Toray Basic Research Center, which has contracted with Kamakura City to preserve the local woodland area



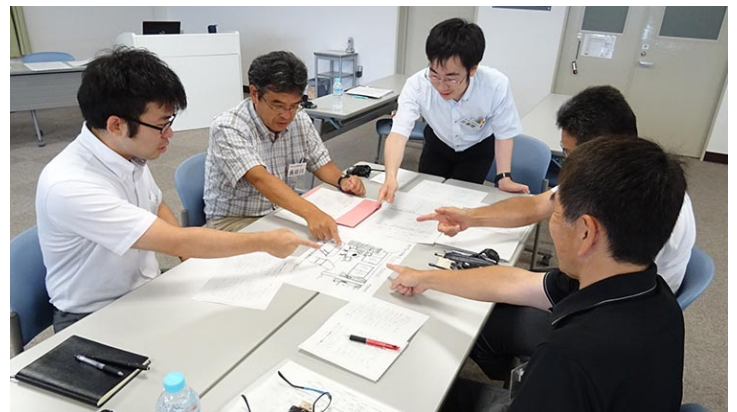
Mt. Fuji tree planting organized jointly by Toray labor and management



Environmental talk given by a non-profit organization (Toray's Okazaki Plant)

## Providing Opportunities for Teachers to Experience Safety and Environmental Activities

As part of the Keizai Koho Center's Business Training for Japanese School Teachers program, Toray has accepted around ten teachers each year in Shizuoka Prefecture since 1994. In addition to lectures, during the three-day training program, teachers get firsthand experience of Toray's safety and environmental activities by participating in hazard-prediction training at manufacturing sites and joining a tour of our Mishima Plant facilities. The impact of the program is multiplied at educational institutions as teachers share with other teachers, principals and students what they have learned about the company's approach and actions.



Hazard-prediction training at the Toray Human Resources Development Center

## Ongoing Support in Areas Affected by the Great East Japan Earthquake

The Toray Group continues to provide support for areas affected by disaster through initiatives that make the most of its own resources.

## Vocational Research Support for Junior High School Students (Toray)

Since 2012, Toray has sent researchers each year to Career Challenge Day<sup>1</sup>, a career education event held in Ofunato City, Iwate Prefecture. Representatives from the Company speak with local junior high school students and explain the nature of the R&D work done at a manufacturer.

1. Career Challenge Day is an alternative program for the workplace experience education that was no longer possible after the Great East Japan Earthquake. In fiscal 2012, the program was awarded the Minister of Education, Culture, Sports, Science and Technology Award.



Researcher from the Toray Composite Materials Research Laboratories gives a talk (July 2017)

## Volleyball Clinic (Toray Tohoku Branch, Toray Arrows)

Since 2013, the Tohoku Branch of Toray has used volleyball as a means of providing support for local reconstruction efforts. In October 2017, ex-national team member Kana Oyama and other former players of the Toray Arrows volleyball team taught children at Miyanomori Elementary School in Higashi Matsushima City, Miyagi Prefecture about the joys of physical activity and teamwork. The program also included a volleyball clinic for adults at the Higashi Matsushima Municipal Gymnasium.



Kana Oyama speaks at Miyanomori Elementary School in Higashi Matsushima City

## Experiencing Toray Technology Event (Chori Co., Ltd.)

Since 2012, Chori Co., Ltd. has held an event in Sendai City, Miyagi Prefecture, to give participants the opportunity to dye materials using the company's natural dye method. In fiscal 2017, Chori held a workshop for handdyeing cloth bags at the Takasago Children's Hall in Sendai City in September.



Event participants and employee volunteers in September 2017

## Social Contribution Activities

Priority Areas



## Health and Welfare

Engaged in Life Innovation businesses, the Toray Group works on initiatives to contribute to health maintenance and longevity. These activities include promoting sports, cancer screening, support for childhood development and welfare at Group worksites.

### Promoting Sports and Childhood Development

In addition to helping to promote sports through athletic activity, Toray also contributes to childhood development through sports instruction and training camps.



Boys' kendo class sponsored by the Toray Kendo Club (Shiga Plant)



Toray Arrows volleyball clinics held across Japan



Boating Club members give instructions to local junior high school boating club.

## Supporting Physical Education at Elementary Schools

Since 2015, former players of the Toray Arrows men's and women's volleyball teams have visited elementary schools to provide support by teaching soft volleyball clinics in physical education classes. In fiscal 2017, the clinics were conducted at two schools in Tokyo, and Toray began collaborating on a new training program for elementary school teachers.



Teaching during an elementary school physical education class



Helping provide practical physical education training for elementary school teachers

## Promoting Sports Participation by Sponsoring the Shanghai International Marathon

Toray and Toray Industries (China) Co., Ltd. are helping to promote sports in China by sponsoring the Shanghai International Marathon. The 2017 edition of this brilliant and spectacular Shanghai event, the 22nd, attracted 38,000 participants.



Runners pack the marathon course

## Supporting the Pink Ribbon Campaign

The Toray Pan Pacific Open Tennis Tournament provides support for the efforts of the Japan Ladies Tennis Federation (JLTF) to eradicate breast cancer. A booth is set up in the arena to sell Pink Ribbon badges, with the money raised donated to help supply breast cancer screening equipment. A mobile mammogram bus is parked at the venue and provides screenings to those who have signed up in advance. Participating tennis players are also actively involved in promoting the campaign.



Mobile mammogram bus

## Supporting Fureai Trio Concerts

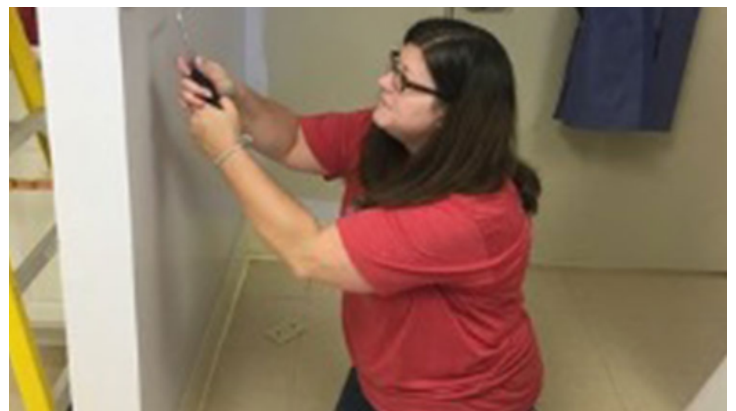
Toray co-sponsors concerts by the Fureai Trio for persons with disabilities, with Toray Group employees helping to organize and run the concerts. In 2017, two concerts were held in Osaka and Tokyo, with Toray inviting 300 and 700 persons, respectively. The volunteers gave directions to the venue and helped people to their seats, as well as helping interested audience members to try playing a violin or come up to the stage to try body percussion.



Fureai Trio Concerts held on January 2018

## Charitable Activities at Group Companies Outside Japan

Toray Group companies outside Japan work with outside organizations to carry out a variety of charitable activities designed to provide solutions to issues that local communities face.



USA: Toray Fluorofibers (America), Inc., Toray Plastics (America), Inc., and Toray Composite Materials America, Inc. worked with the welfare charity United Way to provide donations and participate in volunteer activities.



Italy: Composite Materials (Italy) s.r.l. donated to a project in Legnano to introduce nursing care service vehicles through UILD, a muscular dystrophy support group.



Republic of Korea: Since 2003, the Gumi Plant of Toray Advanced Materials Korea Inc. has collected donations each year to provide support to those in need in Gumi City (10 million won collected in fiscal 2017).



# Safety, Accident Prevention, and Environmental Preservation

Ensure the safety and health of society and employees, and protect the environment in all business processes, from procuring raw materials and manufacturing to the supply and disposal of products

## Policy and Framework

### Sixth CSR Road Map Goals

1. Clarify and fully comply with the basics of safety, and encourage employees to think carefully before taking action to prevent accidents
2. Reduce environmental impact by working to fulfill the Fifth Medium-Term Environmental Plan (achieve targets by fiscal 2020)
3. Pursue environmental preservation on the basis of policies on water resources and biodiversity

### Safety, Health, Accident Prevention and Environmental Preservation Management

## Action Policy and Main Activities

Toray Group operates a policy for safety, health, accident prevention, and environmental activities. The policy is revised every year to reflect the results from the previous fiscal year, and specifies the main activities to implement in each policy area.

Action policy		Main activities
Common	Accomplish risk management	<ul style="list-style-type: none"> <li>• Undertake measures to reduce risks</li> </ul>
Safety	3Z activities <sup>1</sup> for zero accidents	<ul style="list-style-type: none"> <li>• Thorough Anzen Koh-Doh<sup>2</sup> by everyone</li> <li>• Thorough investigation of the root cause of accidents</li> <li>• Thorough elimination of similar accidents</li> <li>• Expand communication to foster positive, communicative, and disciplined workplaces</li> </ul>
Health	Rigorous chemical substance management	<ul style="list-style-type: none"> <li>• Expand and strengthen management of hazardous chemical substances and toxic chemicals</li> </ul>
	Emphasize occupational health management	<ul style="list-style-type: none"> <li>• Implement a plan for countermeasures against pandemic influenza (pandemic influenza BCP)</li> <li>• Enhance mental health management</li> </ul>
Accident prevention	Achieve zero fire accidents	<ul style="list-style-type: none"> <li>• Firmly establish Fire Prevention project part II (FP-II) and roll out to overseas affiliates</li> </ul>
	Improve large-scale earthquake response	<ul style="list-style-type: none"> <li>• Develop large-scale earthquake response plans</li> <li>• Execute large-scale earthquake and tsunami response drills</li> </ul>
Environment	Achieve zero environmental accidents	<ul style="list-style-type: none"> <li>• Implement strict measures to prevent environmental accidents</li> </ul>
	Implement the Fifth Medium-Term Environmental Plan	<ul style="list-style-type: none"> <li>• Reduce greenhouse gases</li> <li>• Reduce atmospheric emissions of chemical substances</li> <li>• Achieve waste reduction targets</li> </ul>

1. 3Z Activities is a program that aims for zero accidents, zero problems, and zero claims under the slogan of "Maintaining Zero, Day-to-Day." The Manufacturing Division leads the program, which aims to achieve the goals of the Toray Group's medium-term management program.
2. This refers to thinking about and acting on the basics of safety in order to enhance personal hazard sensitivity, identify hazards in the workplace, and ensure one's own safety.

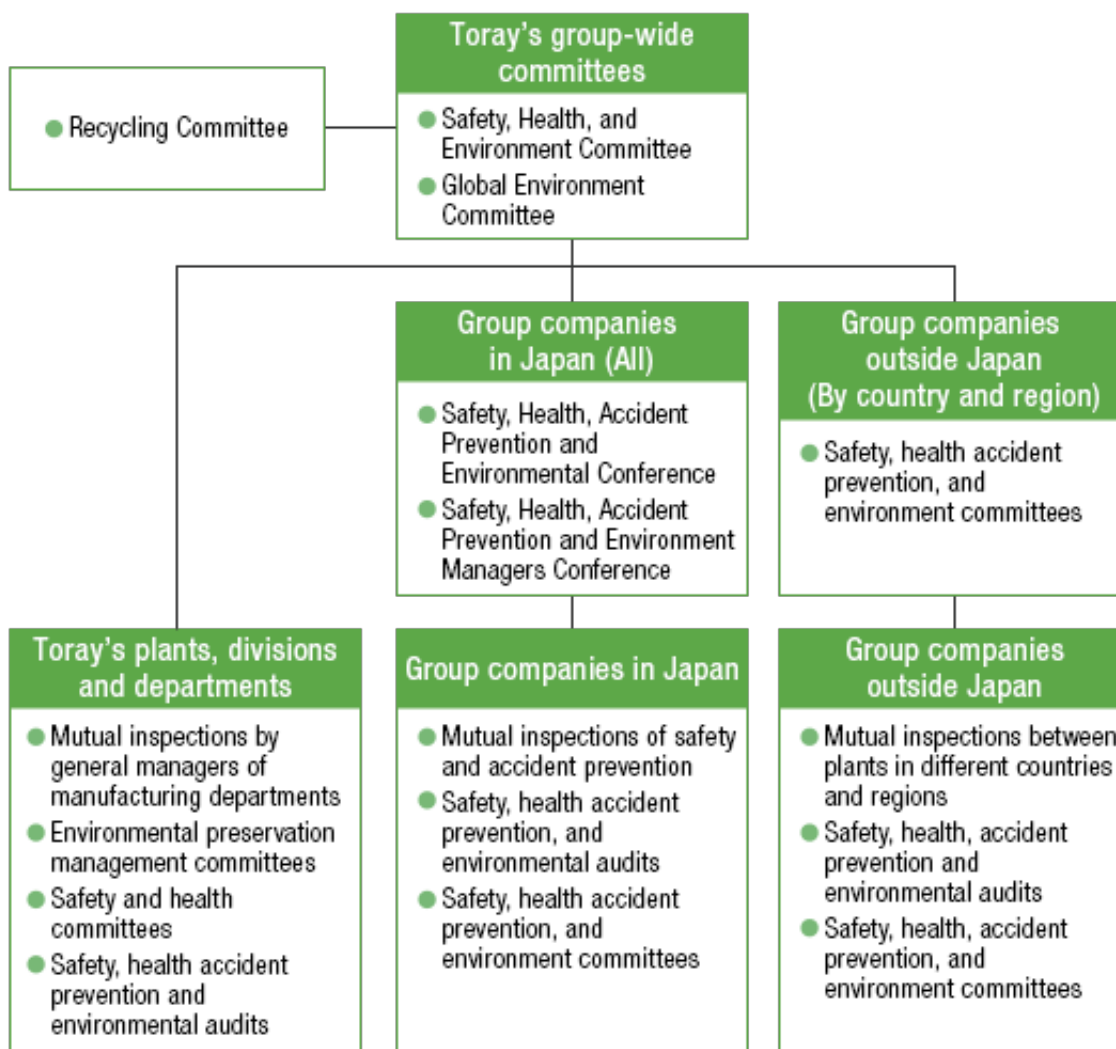
## Safety, Health, Accident Prevention, and Environmental Preservation Promotion System

Toray implements its system for safety, health, accident prevention, and environmental preservation through two group-wide committees: the Safety, Health, and Environment Committee and the Global Environment Committee.<sup>3</sup> (See chart below.)

The Safety, Health, and Environment Committee establishes policies and strategies for the entire Toray Group. The Global Environment Committee discusses and sets strategies aimed at securing the growth of the Green Innovation business, fighting climate change, and helping to build a recycling-oriented society.

3. With the dissolution of the Global Environment Committee on August 1, 2018, responsibility for environmental technology development was transferred to the Technology Committee and responsible care to the Safety, Health, and Environment Committee. The Recycling Committee, which had been overseen by the Global Environment Committee, was also eliminated, and product recycling initiatives are now implemented by individual business divisions.

Safety, Health, Accident Prevention, and Environmental Preservation Promotion System (Fiscal 2017)



## Audits and Follow-Up Measures

The Toray Group conducts annual audits to objectively assess and improve the execution and management of safety, health, accident prevention, and environmental initiatives at offices and plants of group companies. Internal audits are conducted using a standardized audit checklist, and encompass visits and production floor guidance provided by directors and managers from other group companies.

In fiscal 2017, audits were conducted for all 13 plants and one research laboratory at Toray, 46 plants operated by 24 group companies in Japan, and 70 plants operated by 50 group companies outside Japan. The audits focused on four areas: efforts to increase safety awareness and change behavior led by unit heads and unit chiefs, initiatives to eliminate the occurrence of rotary machine accidents, expansion of the four tasks<sup>4</sup> under the Fire Prevention Project Part II, and progress on Fifth Medium-Term Environmental Plan activities. The audits helped to secure systematic improvements by identifying and addressing facility issues and issues relating to management.

4. The four tasks are: (1) effectively use fire-prevention checklists; (2) enhance fire-prevention training; (3) enhance change management; and (4) build a construction safety management system for hot work.

## ISO 14001 Certification

The Toray Group is pursuing the acquisition of ISO 14001, the certification for environmental management system, by all of its group companies, offices, and plants. Toray had completed accreditation for all 13 of its plants by the end of 2000. By fiscal 2017, 35 plants at 21 group companies in Japan and 57 plants at 42 group companies outside Japan were certified. In fiscal 2017, Lacq Plant at Toray Carbon Fibers Europe S.A. newly acquired ISO 14001 certification.

## Responsible Care Program

Under Responsible Care programs, chemical companies pursue voluntary management of chemical substances, transparent disclosure, and communication with the public. Companies committed to Responsible Care take safety, health, and environmental measures across the entire product lifecycle—from development, manufacturing, distribution and consumer use to the disposal—and then disclose the results of their efforts.

Toray implements its program in accordance with the Responsible Care Global Charter.<sup>5</sup> In fiscal 2017, Toray set priority issues: implementing the Fifth Medium-Term Environmental Plan, strengthening accident-prevention countermeasures via the second phase of its Fire Prevention Project, and preparing for the chemical risk assessments specified in Japan's revised Industrial Safety and Health Act.

5. The Responsible Care Global Charter was originally established in 2005 to encourage companies to take concrete action that is understandable to external stakeholders. The Charter was revised in 2014, and Toray was a signatory to both the original and revised Charter.

## **Complying with REACH and Other International Chemical Substance Regulations**

All business divisions of Toray, as well as its group companies in and outside Japan, have systems in place for securing compliance with European regulations on the Registration, Evaluation, Authorization and Restriction of Chemical Substances (REACH). The Toray Group is systematically working toward registration of designated substances by the final deadline of May 31, 2018. The Group monitors chemical substance regulations in other regions and countries including Taiwan and South Korea, sharing the information about changes and providing support to secure compliance. Toray and some of its group companies in Japan use the List of Lists (LOLI) Database,<sup>6</sup> a comprehensive database of chemical hazard and toxicity information and regulations in countries around the world, to ensure that they handle chemical substances safely and in compliance with relevant laws and regulations worldwide.

6. Provided by the U.S. company, ChemADVISOR, Inc., LOLI is a search tool and database of regulatory lists from many countries around the world.

## **Complying with Japan's Chemical Substances Control Law**

With the revision of Japan's Chemical Substances Control Law<sup>7</sup> in April 2011, companies have been required to report on the manufacture, import, and utilization of general chemical substances. Toray and its group companies in Japan systematically responded to the revision and completed their report covering fiscal 2017 in June 2018.

7. Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.

**Safety, Accident Prevention, and Environmental Preservation**

# Occupational Safety and Accident Prevention Activities

Employees are key stakeholders of the Toray Group. Needless to say, ensuring their safety is the prerequisite to their capacity to make the most of their potential. Officers and employees work together to implement persistent safety initiatives with the goal of zero accidents, out of respect for humanity and the sanctity of life. To raise the awareness, every year, the Toray Group creates a group-wide safety slogan. In fiscal 2017, the Group used the unique keyword of “Anzen Koh-Doh”<sup>1</sup> to remind employees worldwide to take thoughtful safety actions. The Toray Group is working hard to ensure that the message reaches all of its employees including those at group companies outside of Japan.

Due to the potentially serious impact of an accident not only within the company but on surrounding communities, the Group acts with strong determination to prevent accidents such as fires and explosions, making accident prevention a top priority.

1. This refers to thinking about and acting on the basics of safety in order to enhance personal hazard sensitivity, identify hazards in the workplace, and ensure one’s own safety.

## **2019 Safety Slogan**

AP-G 2019

We Should Achieve “Zero Accidents”. Each of us does “Anzen Koh-Doh”!

—“Seriousness,” “Motivation,” “Awareness”

Every year, company presidents and plant managers from Toray and its group companies around the world meet at the Toray Group Safety Meeting. At the meeting, presentations on safety action policies and main activities, lectures by external experts, and activity reports from worksites are offered to raise awareness of safety. The Group’s employees are all united under the leadership of top management in working on safety activities with the aim of achieving zero accidents.

Furthermore, the Safety Summit, safety lectures by Toray’s directors, and other events are held on a national and regional basis, and at each group company and plant of the Group. These efforts promote a common awareness of the Toray Group safety slogan, policies, and main activities, enabling centralized management of safety activities across the Group.



2017 Toray Group Safety Meeting in Toray Human Resources Development Center



Toray Group Safety Summit in China

## Toray Group Safety Record

### Number of major accidents

Reporting scope: Toray Group

2017 (calendar year) target:

0



Result:

1

### Number of fire and explosion accidents

Reporting scope: Toray Group

2017 (calendar year) target:

0



Result:

3

### Achieve world's best standard for safety management (not exceeding 0.05 frequency rate for occupational accidents resulting in lost work time)

Reporting scope: Toray Group

2017 (calendar year):

No more than 0.05



Result:

0.39

Toray has collected data on all occupational accidents since 1980, and for the Toray Group since 1990. Both the number of occupational accidents and frequency of occupational accidents resulting in lost work time have declined, compared with when the data was first collected.

In 2017, there was one serious accident at a group company outside Japan involving the collision of a commuter bus that the Toray Group contracts, in which six people were injured. Toray requested that the bus company reinforce its transportation safety measures and has offered support and guidance.

The frequency rate for occupational accidents resulting in lost work time for the Toray Group overall in 2017 increased by 0.06 points to 0.39. Although this is a positive result compared with that of Japan's manufacturing industry (1.02), it fell far short of the target of 0.05 or lower.

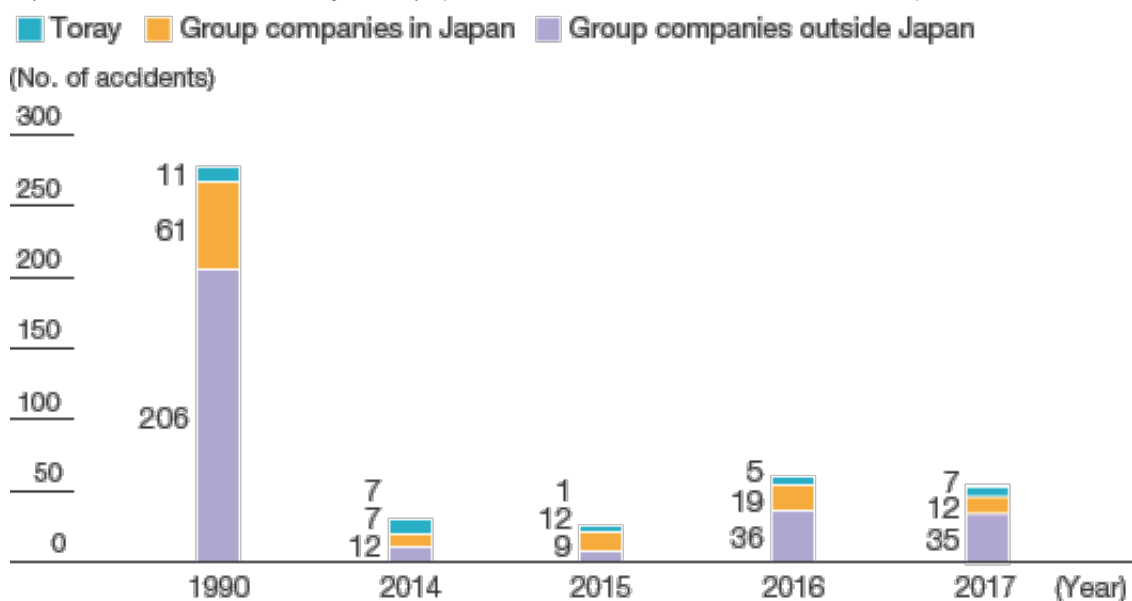
One reason for this is that group companies outside Japan that recently joined the Toray Group had many accidents resulting in lost work time. Accordingly, the Group is working to strengthen safety management at those group companies with support and guidance from Toray's main plant in Japan. In addition, there were three small-scale fires at



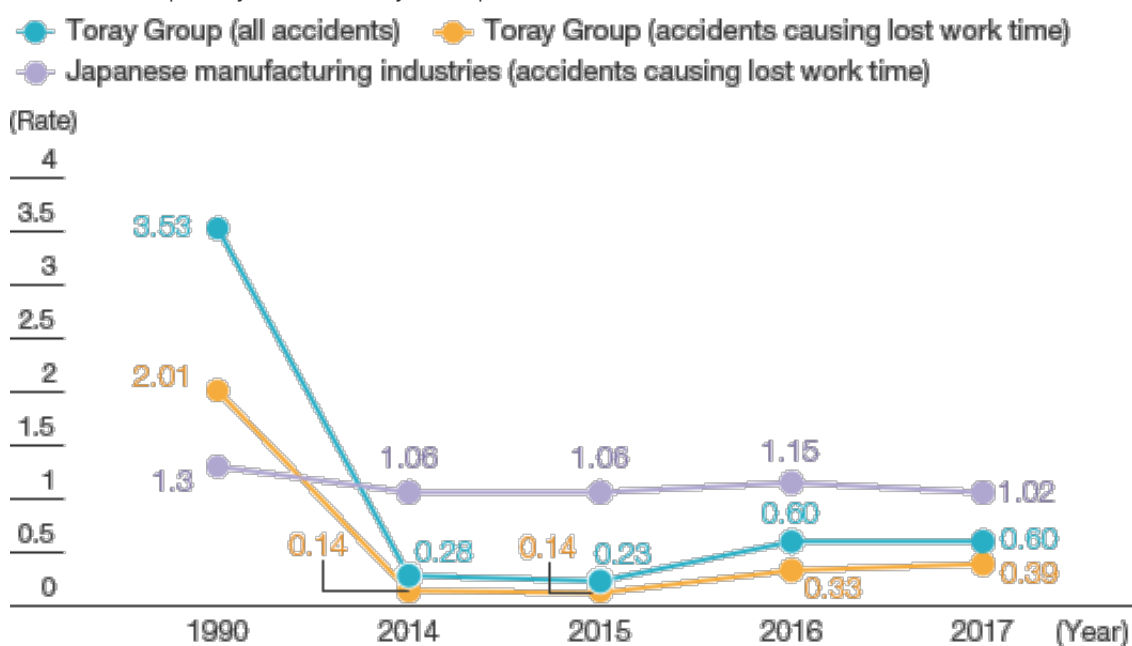
A safety meeting with the participation of unit heads at Toray's Tokai Plant

group companies outside Japan. These accidents did not result in any personal harm or have any effects outside of the plants. The accidents were caused by inadequate management of flammable gas, poor workmanship after equipment installation, and insufficient inspections of construction equipment. Toray is working to enhance management of all of these factors. Toray will identify the root cause of each accident to prevent reoccurrence, and avoid similar accidents based on the lessons learned in these accidents, while taking “Anzen Koh-Doh” even further. To ensure familiarity with “Anzen Koh-Doh” practices, unit heads in charge of work sites will take the leading role at Toray and its group companies in Japan in reforming safety awareness and actions in their own workplaces. Toray has held report meetings for discussion of safety, in which unit heads meet to share and discuss their activities, since 2015. Toray continues to aim to improve safety for the overall Group and cut accidents to zero.

Number of Occupational Accidents: Toray Group (Lost work time and non-lost work time)



Occupational Accident Frequency Rate<sup>2</sup>: Toray Group



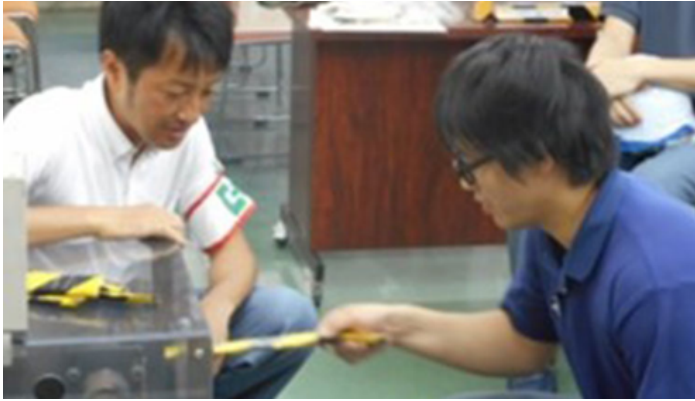
2. Occupational accident frequency rate: The number of fatalities and injuries at worksites per one million cumulative working hours



## Enhancing Safety and Accident-Prevention Training

As part of their safety and accident prevention training, Toray Group companies and plants provide workshops and hands-on simulations to sensitize employees to dangers and hazards. Safety devices are used to simulate dangers such as getting caught up in rollers, electrocution, and residual pressure. In the area of accident prevention, the Group conducts simulation training to teach employees about the risk of fires and explosions, and provides training on the fundamentals of accident prevention.

Additionally, the Group publishes on familiar topics regarding safety and accident prevention in its in-house newsletter, People. In 2017, as in the previous year, the newsletter focused on the basics of fires and explosions.



Simulation training at Toray's Shiga Plant



Demonstrating the danger of fires and explosions at Toray's Ishikawa Plant



Fire safety exhibition room at Toray's Seta Plant

## Implementing Safety Management Together with Subcontractors

The Toray Group recognizes its duty to ensure the safety of the many subcontractors working at its sites. Occupational health and safety committees meet once a month with the participation of representative employees from subcontractors. Regular safety and liaison meetings are conducted to gain input from subcontractors, and are used to communicate the Group's policies and measures. At plants, Toray and subcontractors work together on safety initiatives, including safety posters, slogan contests and safety suggestions.



Safety meeting at Toray's Chiba Plant

## Mutual Safety Inspections by Toray Affiliates on Premises of Toray Plants

Toray had the presidents of 10 Toray affiliates that provide ancillary services for plant operations participate in annual mutual safety inspections of their facilities in order to verify the progress of safety initiatives. In 2017, the monitoring of hazardous work included rotary machinery and heavy load transport. Personnel advised each other on areas needing improvement and monitored the progress of improvements.



Mutual safety inspection at Shiga Shokusan Inc.

## Preparing for Accidents through Fire-Prevention Drills

All companies and plants in the Toray Group are making efforts to improve their accident-prevention capabilities by carrying out fire-fighting drills specifically intended for fires and explosions. These drills include practice using water hoses, rescuing the injured, responding to a chemical leak, and giving emergency notification to authorities and local residents.

Group plants that are next to the sea conduct evacuation drills in the event of a tsunami triggered by a large-scale earthquake.



First aid training at Toray Construction Co., Ltd.

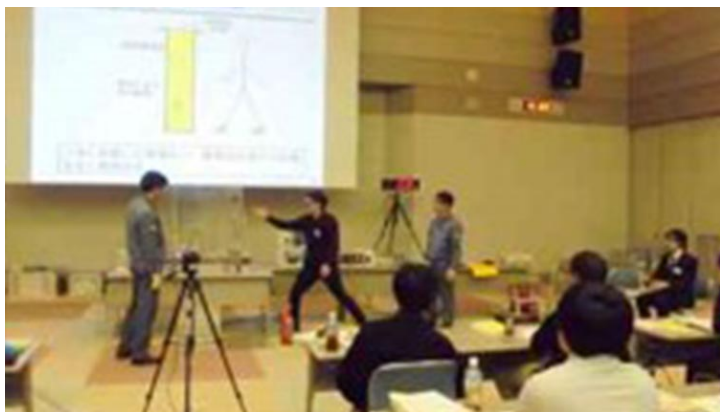
## Initiatives for Improving Fire-Prevention Capabilities

In 2017, the Toray Group outlined four key tasks (see below) to strengthen fire prevention at the Toray Group. The Toray Group's internal accident prevention experts provided support and guidance in identifying the root cause and taking countermeasures to prevent reoccurrence of those fire accidents and near misses for which the experts decided onsite audits and investigations were necessary.

In earthquake preparedness measures, Toray places the highest priority on employee safety and has adopted an employee safety verification system and implemented evacuation drills to strengthen its earthquake response. Additionally, the Group conducts business continuity planning in order to meet its social responsibility to keep supply lines open in the event of a large-scale earthquake.

### Four Tasks

Tasks	Results of 2017 activities
Effectively use fire-prevention checklists	<ol style="list-style-type: none"> <li>1. Fostered leaders who can facilitate the use of fire-prevention checklists while giving instructions (in Japan)</li> <li>2. Fostered sub-leaders who actually use fire-prevention checklists at plants (in Japan)</li> </ol>
Enhance fire-prevention training	<ol style="list-style-type: none"> <li>1. Provided fire-prevention training for engineers, etc., company-wide (elementary and intermediate levels)</li> <li>2. Provided fire-prevention training for operators at plants (younger operators and leader courses)</li> </ol>
Enhance change management	<ol style="list-style-type: none"> <li>1. Started to operate manufacturing process change standards on manufacturing conditions, work contents, workers and equipment.</li> <li>2. Started to apply these standards at group companies outside Japan guided by Toray's mother plant</li> </ol>
Build a safety management system for hot work	<ol style="list-style-type: none"> <li>1. Supported and guided companies and plants to appropriately operate the framework (in Japan)</li> <li>2. Started to roll out the initiative to group companies outside Japan</li> </ol>



Fire-prevention training for engineers, etc., company-wide (Toray Human Resources Development Center)

## Distribution Safety Initiatives

Toray is working to ensure safe distribution in its operations. In an effort to manage safety when transporting hazardous substances, Toray concludes security agreements with certain customers, raw material manufacturers, and shipping companies to designate their specific safety responsibilities and roles with regards to safety.

### Health Effects and Response to Asbestos

The Toray Group has manufactured and imported building materials containing asbestos in the past. In addition, certain buildings and facilities were constructed using such materials and thermal insulation containing asbestos. Starting in 2005, when asbestos-related health hazards became a social concern in Japan, Toray took action to address the issue of its own asbestos-containing facilities. The health program offers medical examinations to current and former employees who handled even small amounts of asbestos and wish to undergo an examination. The Toray Group is working in good faith with individuals diagnosed with asbestos-related health issues by assisting with their applications for workers' compensation and providing an ongoing program of medical examinations. The Group has not been contacted about health issues by residents living near affected plants.

The health effects on former and current the Toray Group employees as of March 31, 2018 are described below.

- Certified occupational accidents arising from handling asbestos (Toray Group): 97 (67)
- Certified health victims based on Japan's Act on Asbestos Health Damage Relief (Toray Group): 9 (9)
- Medical examination recipients involving asbestos (Toray Group): 3,995

Note: Figures in parentheses refer to fatalities.

**Safety, Accident Prevention, and Environmental Preservation**

## Progress on the Fifth Medium-Term Environmental Plan

The Toray Group is now implementing its Fifth Medium-Term Environmental Plan, which runs from fiscal 2016 to fiscal 2020. The plan aims to further reduce the Group's environmental impact.

Amid further projected increases in production volumes for high-performance films and carbon fiber, the Group will continue to pursue environmental initiatives in order to achieve the challenging targets of the new plan.

### Progress on Fifth Medium-Term Environmental Plan Targets

Area	Toray Group fiscal 2020 target	Fiscal 2017 results
Curb global warming	Maintain greenhouse gas emissions at least 15% below the fiscal 1990 level (Toray)	20% reduction
	15% or greater reduction in greenhouse gas emissions per unit of sales compared to fiscal 1990 (Toray Group in Japan)	24% reduction
Management of chemical substances	Atmospheric emissions of PRTR Law-Specified substances: Maintain at least 70% below the fiscal 2000 level (Toray Group)	67% reduction
	Atmospheric emissions of volatile organic compounds (VOCs): Maintain at least 70% below the fiscal 2000 level (Toray Group)	72% reduction
Waste reduction	Zero emissions goal: Achieve at 45 or more Toray Group plants	Achieved at 45 plants
	Simply disposed waste rate: 22.5% or lower (Toray Group)	21.8%
	Recycling rate: Maintain at 86% or more (Toray Group)	85.8%
	Landfill waste rate: 1.3% or lower (Toray Group in Japan)	1.2%

## Safety, Accident Prevention, and Environmental Preservation

# Conserving Energy and Curbing Global Warming

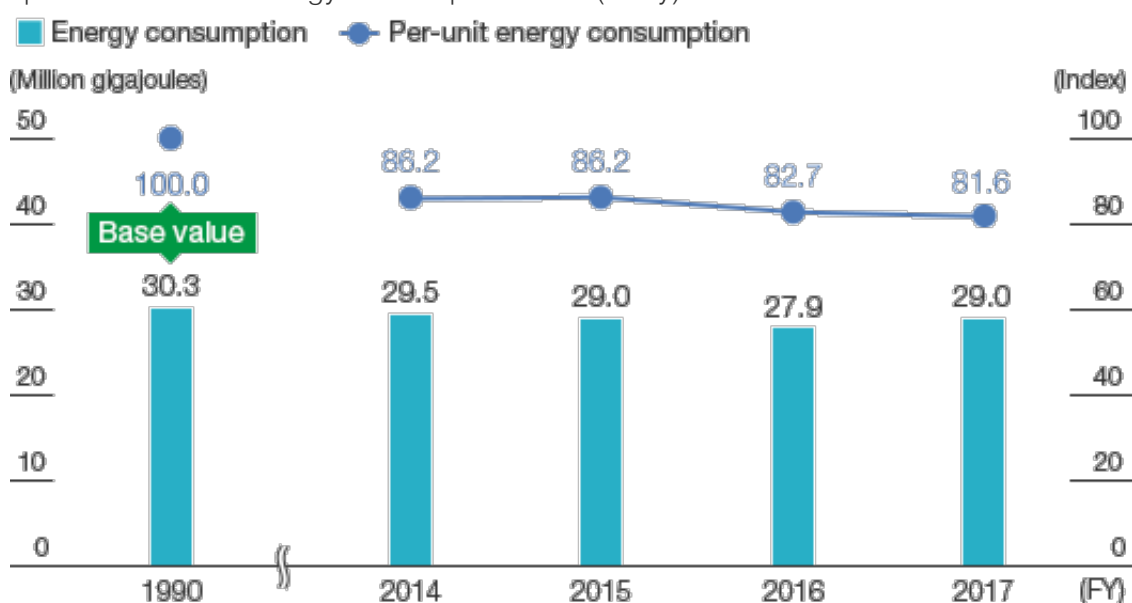
### Addressing Global Warming

With a view to helping realize sustainable, low-carbon societies, the Toray Group has been pursuing initiatives for reducing greenhouse gas emissions. Toward this end, the Group works to save energy by improving manufacturing processes and introducing cogeneration in accordance with its Fifth Medium-Term Environmental Plan, which was launched in fiscal 2016.

### Toray Energy Conservation Activities

Toray has set a goal of reducing its per-unit energy consumption by 2% annually. In fiscal 2017, Toray's energy consumption was increased by 4.0% year-on-year due mainly to an increase in production volumes. Meanwhile, its per-unit energy consumption was improved by 1.3% year-on-year, bringing it down now to 18.4% below the base year of fiscal 1990. The improvement was achieved due to steady implementation of energy conservation initiatives at plants, as well as energy conservation diagnostics performed by the Company's own energy efficiency specialists.

Energy Consumption and Per-unit Energy Consumption Index (Toray)



The Toray Group organizes energy conservation teams to help carry out annual energy conservation diagnostics at plants in Toray and its group companies around the world. In fiscal 2017, these activities were conducted at 6 of Toray's plants, along with 4 group company plants at in Japan and one outside Japan. Thanks to these proactive energy-saving initiatives, the Group reduced greenhouse gas emissions by about 32,400 tons-CO<sub>2</sub> equivalent.



Review for energy conservation diagnostics at Polymerization Section of Toray's Tokai Plant

## Toray's Efforts to Fight Global Warming

### Reduction of greenhouse gas emissions per unit of sales

Reporting scope: Toray Group (Japan)

Fiscal 2017 target:

At least 15% lower than fiscal 1990



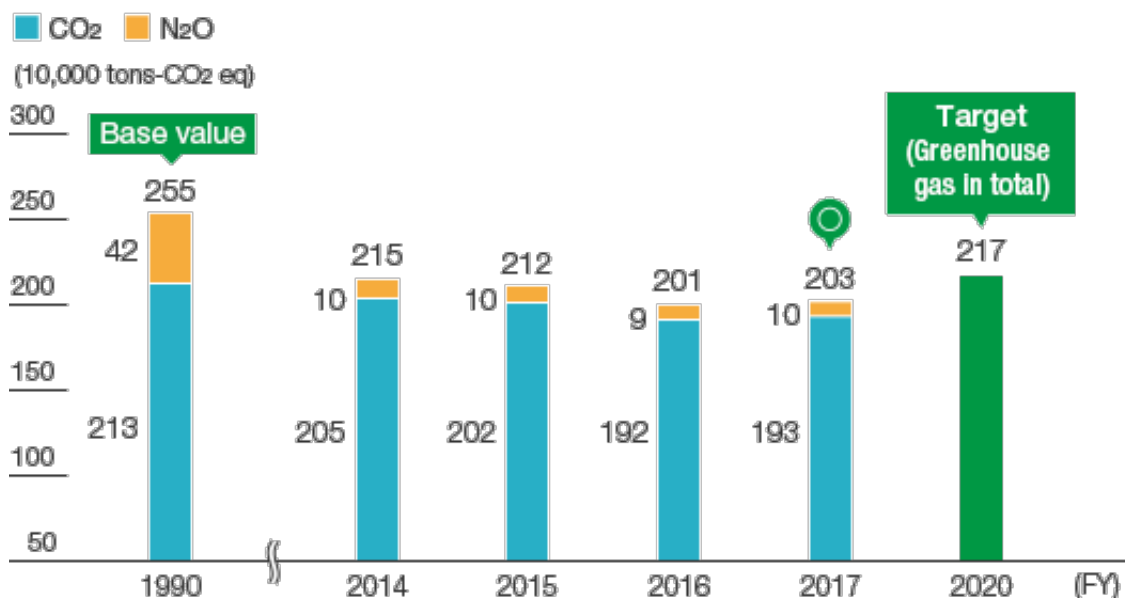
**Result:**

**20% reduction**

Toray systematically works to reduce greenhouse gas emissions, with the goal of maintaining greenhouse gas emissions at least 15% lower than the 1990 level by 2020. In fiscal 2017, Toray's CO<sub>2</sub> emissions increased by 18,000 tons year-on-year. Greenhouse gas emissions were up 1.1% year-on-year at 2.03 million tons, which was 20.1% below the 1990 level, continuing to meet the reduction target.

Moving forward, Toray will endeavor to meet its reduction targets despite the higher production volumes projected due to business growth.

## Greenhouse Gas Emissions (Toray)



### Related Information

Toray has obtained third-party assurance of its greenhouse gas emissions from Lloyd's Register Quality Assurance Limited (LRQA) for Scope 1 (direct emissions from plants, offices, vehicles, etc. owned by the Company), Scope 2 (indirect emissions from the generation of energy), and Scope 3 (other indirect emissions).<sup>1</sup>

Scope 1: 1,650,000 ton

Scope 2: 380,000 ton

Scope 3: 770,000 ton

1. Scope 3 emissions are calculated for Category 2 (capital goods), Category 3 (fuel and energy-related activities not included in Scope 1 or Scope 2), and Category 4 (upstream shipping and distribution).

> [Third-Party Assurance](#)

> [Toray Group Distribution Initiatives](#)

## Gas Cogeneration and Renewable Energy Systems

The Toray Group is systematically switching to natural gas and installing cogeneration systems to conserve energy. In fiscal 2015, Toray's Mishima Plant began operation of a cogeneration system.

As an initiative for effective use of renewable energy, Toray installed and started to operate a small hydroelectric system that generates power using the incoming industrial water pressure in Nagoya Plant in fiscal 2016, and installed a solar power generation system in Seta Plant in fiscal 2017. Both systems have been operating.





Small hydroelectric power generator at Toray's Nagoya Plant



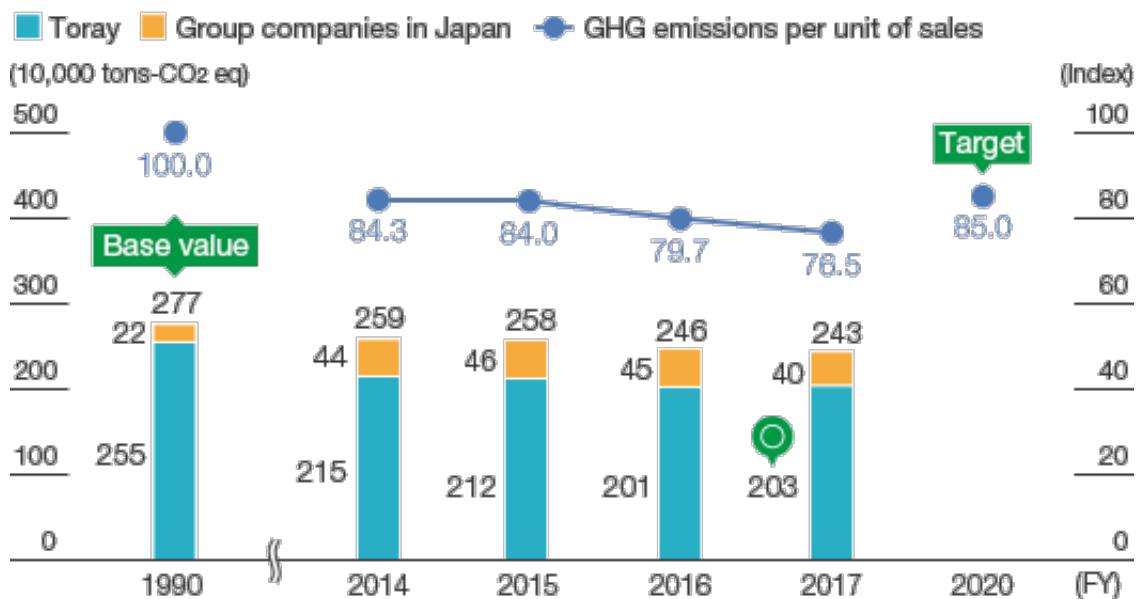
Solar power generation system at Toray's Seta Plant

### Greenhouse Gas Emissions (Toray Group in Japan)

Toray and its group companies in Japan work to curb global warming with the goal of reducing emissions by 15% on a per-unit-of-sales basis by fiscal 2020 compared to the fiscal 1990 level.

Greenhouse gas emissions were down 1.1% in fiscal 2017 compared to the previous fiscal year. Greenhouse gas emissions per unit of sales improved by 3.1 points compared to the previous fiscal year and were 23.5% below the base year.

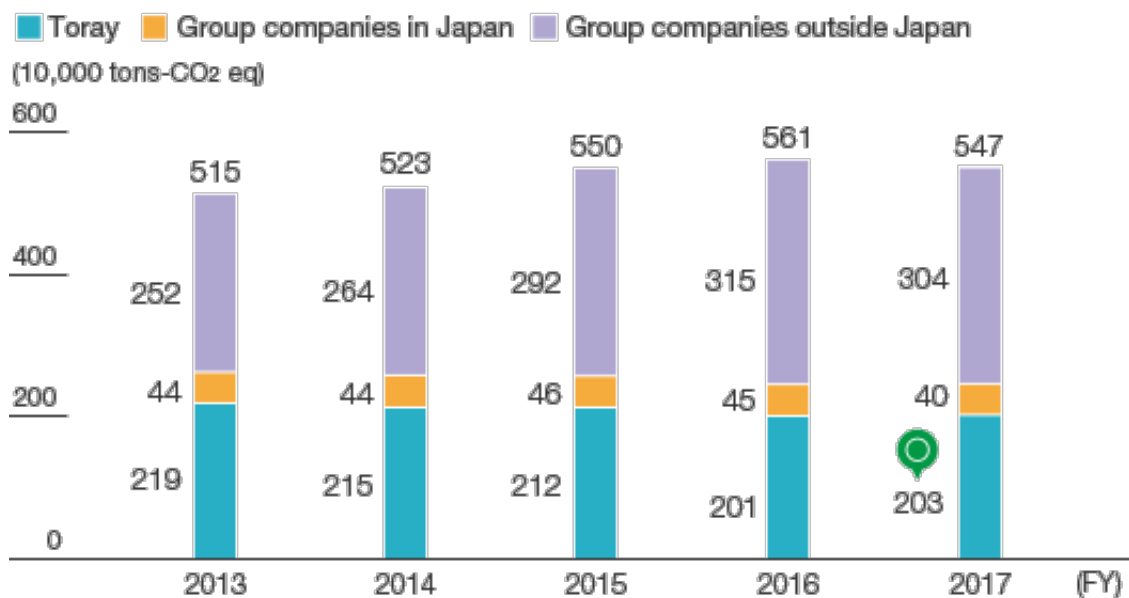
#### Greenhouse Gas Emissions and Greenhouse Gas Emissions Per Unit of Sales (Toray Group in Japan)



### Greenhouse Gas Emissions (Toray Group)

Fiscal 2017 greenhouse gas emissions for the Toray Group worldwide were 5.47 million tons-CO<sub>2</sub> equivalent, a decrease of 2.4% compared to the previous year. All Toray Group manufacturing companies and plants will continue to work to achieve the Group's goal of reducing the per-unit energy consumption rate by 2% each fiscal year.

## Greenhouse Gas Emissions (Toray Group)



### Related Information

> [CO<sub>2</sub> Emissions Resulting from Toray's Distribution Activities](#)

## Initiatives to Protect the Ozone Layer

Toray successfully ceased using chlorofluorocarbons (CFCs) in all manufacturing processes in 1994. The Company has also stopped purchasing CFCs for use in refrigeration equipment and will finish upgrading refrigeration equipment that uses CFCs by fiscal 2019.

**Safety, Accident Prevention, and Environmental Preservation**

# Voluntary Initiatives to Reduce Atmospheric Emissions of Chemical Substances

As a corporate group that does business in the chemicals sector, the Toray Group places the highest priority on reducing emissions of chemicals into the atmosphere in order to reduce its environmental impact.

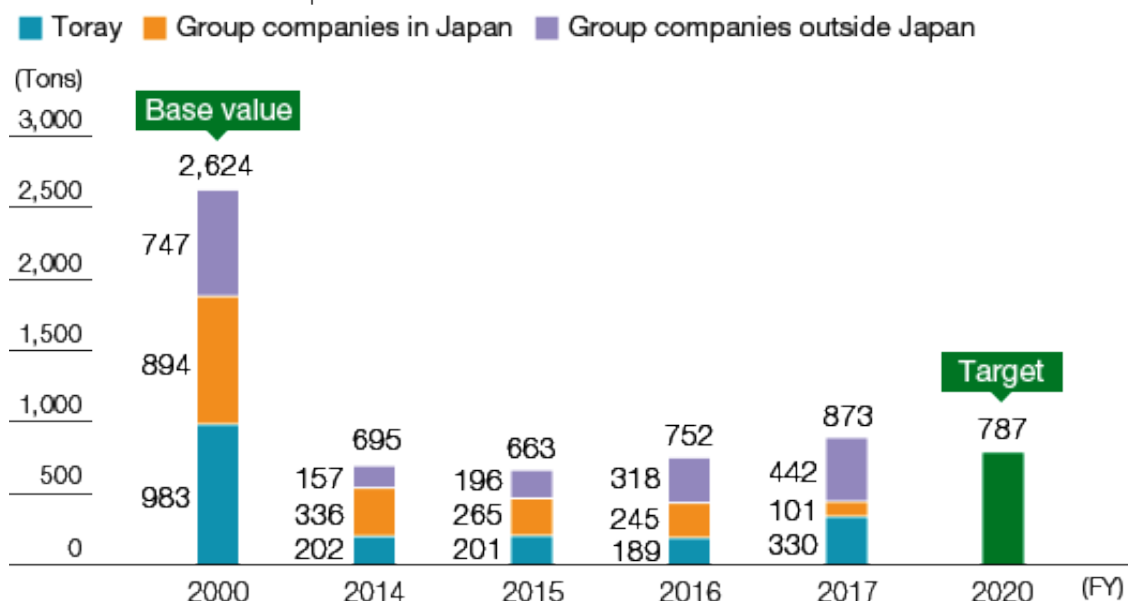
Under the Fifth Medium-Term Environmental Plan, which covered fiscal 2016–2020, the Group works to achieve its targets for reducing atmospheric emissions of volatile organic compounds (VOCs) and substances specified under Japan's Pollutant Release and Transfer Register Law (PRTR Law).

## Reducing Atmospheric Emissions of PRTR Law-Specified Substances

In fiscal 2017, the Toray Group's atmospheric emissions of PRTR Law-specified substances were 873 tons, which represented a 67% reduction compared to the base year of fiscal 2000. However, the Group fell slightly short of the target of a 70% reduction compared with the base year under the Fifth Medium-Term Environmental Plan.

In fiscal 2017, the amount of atmospheric emissions of PRTR Law-specified substances increased due to increased production volume at the Toray Nasu Plant (formerly Toray Battery Separator Film Co., Ltd.), Toray Battery Separator Film Korea Limited (TBSK), and other Toray sites. Toray aims to reduce atmospheric emissions by improving waste gas adsorption device operations and taking other measures.

Atmospheric Emissions of PRTR Law-Specified Substances



Note: In fiscal 2017, Toray Battery Separator Film Co., Ltd., a group company in Japan, was absorbed by Toray Industries, Inc., becoming the Nasu Plant. Accordingly, in the base value for fiscal 2000, 200 tons of emissions have been transferred from “Group companies in Japan” to “Toray.”

## Reduction of Atmospheric VOC Emissions

### Reduction of atmospheric VOC emissions (%)

Reporting scope: Toray Group

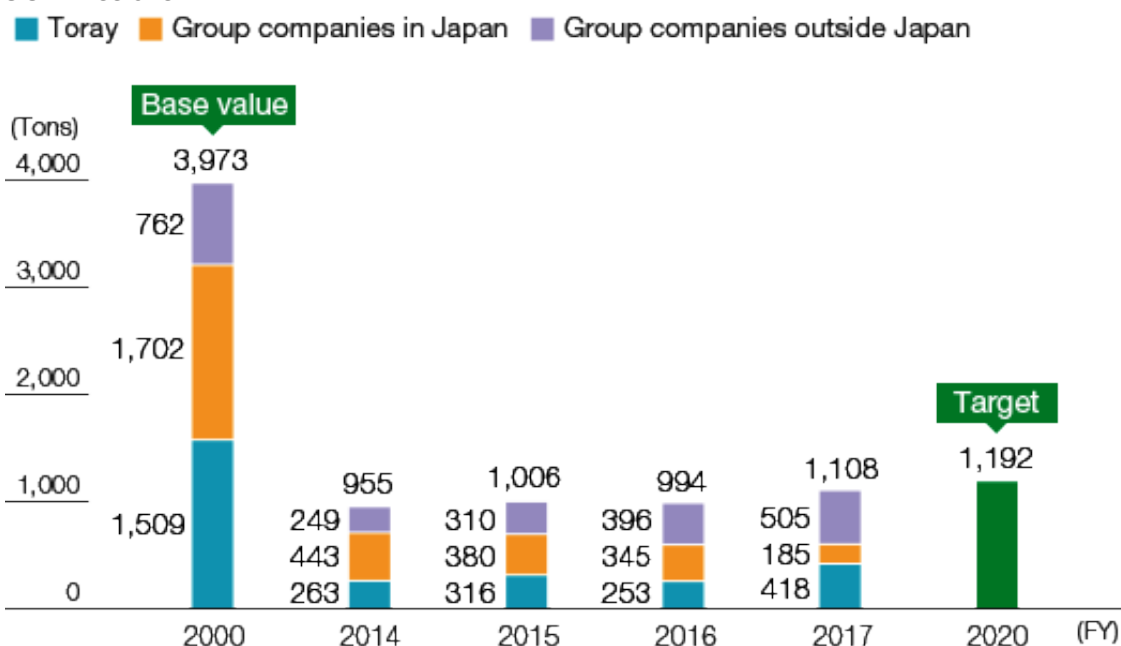
Fiscal 2017 target:  
At least 70% lower than fiscal 2000



**Result:**  
**72%**

In fiscal 2017, the Toray Group's atmospheric VOC emissions were 1,108 tons, up 11% (114 tons) compared to the previous fiscal year. The major factor driving them up was increased production at Toray Battery Separator Film Korea Limited (TBSK). Toray is working to reduce planned emissions by taking steps such as installing VOC removal filters. The emissions were 72% below the base year of fiscal 2000, achieving the fiscal 2020 target of a 70% reduction compared to the base year.

### Atmospheric VOC Emissions



Note: In fiscal 2017, Toray Battery Separator Film Co., Ltd., a group company in Japan, was absorbed by Toray Industries, Inc., becoming the Nasu Plant. Accordingly, in the base value for fiscal 2000, 200 tons of emissions have been transferred from “Group companies in Japan” to “Toray.”

## Safety, Accident Prevention, and Environmental Preservation

# Initiatives to Prevent Air and Water Pollution

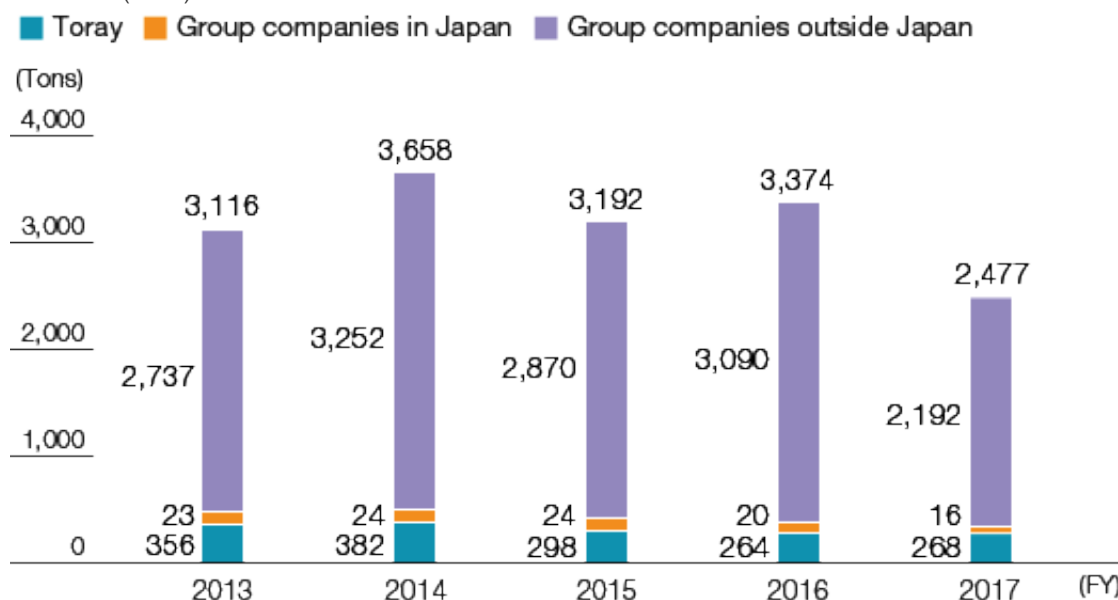
The Toray Group implements ongoing initiatives at production sites to reduce sulfur oxide (SOx) emissions by installing desulfurization equipment and switching to cleaner fuels, and reduce chemical oxygen demand (COD) by expanding wastewater treatment facilities.

### Air Quality Management

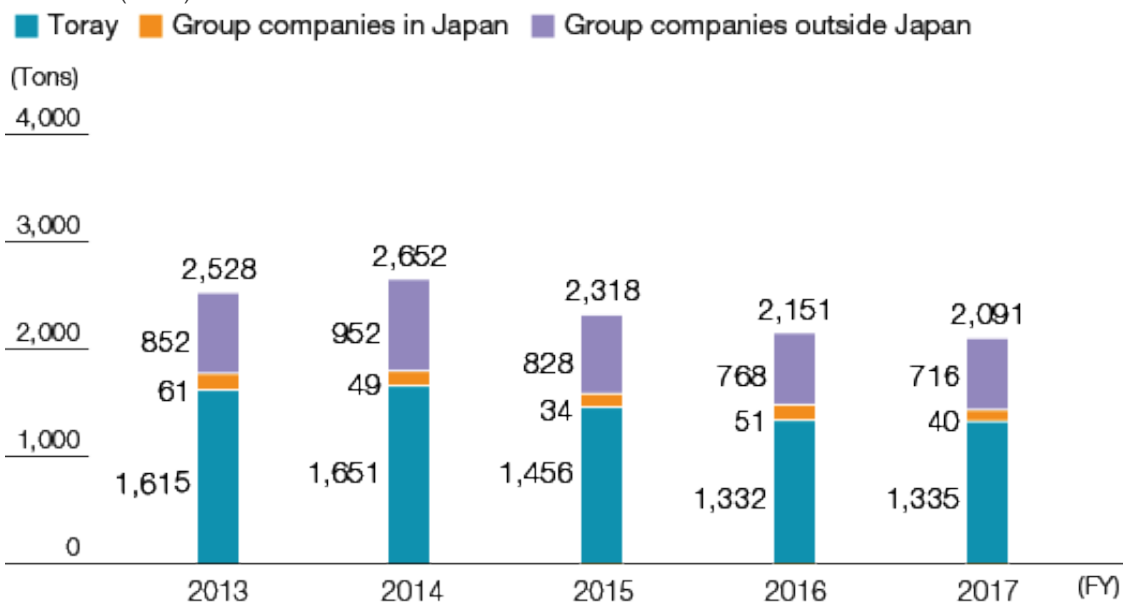
In fiscal 2017, the Toray Group recorded 2,477 tons of SOx emissions (down 27% year-on-year), 2,091 tons of NOx emissions (down 3% year-on-year), and 227 tons of dust emissions (down 34% year-on-year).

The decrease in SOx emissions was due to fuel conversion and increased use of low-sulfur coal at group companies outside Japan. The reduction in dust emissions was due to a switch to cleaner fuels and improved efficiency in removing dust from boiler waste gas at group companies outside of Japan. The reduction in NOx emissions was due to the increase in natural gas boiler operations at group companies outside of Japan.

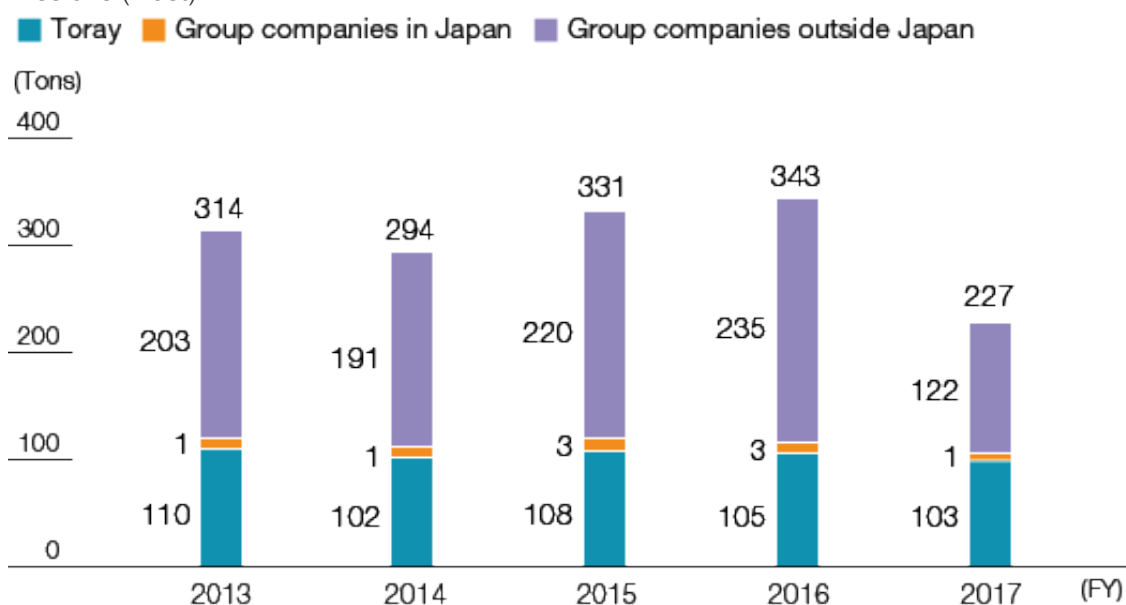
Atmospheric Emissions (SOx)



## Atmospheric Emissions (NOx)



## Atmospheric Emissions (Dust)

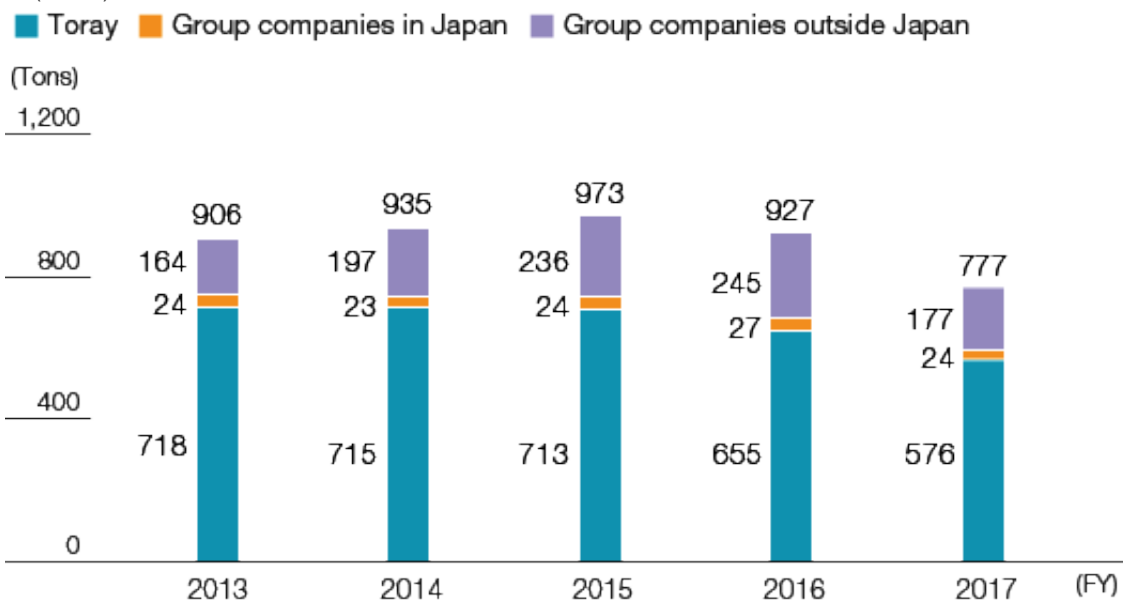


## Water Quality Management

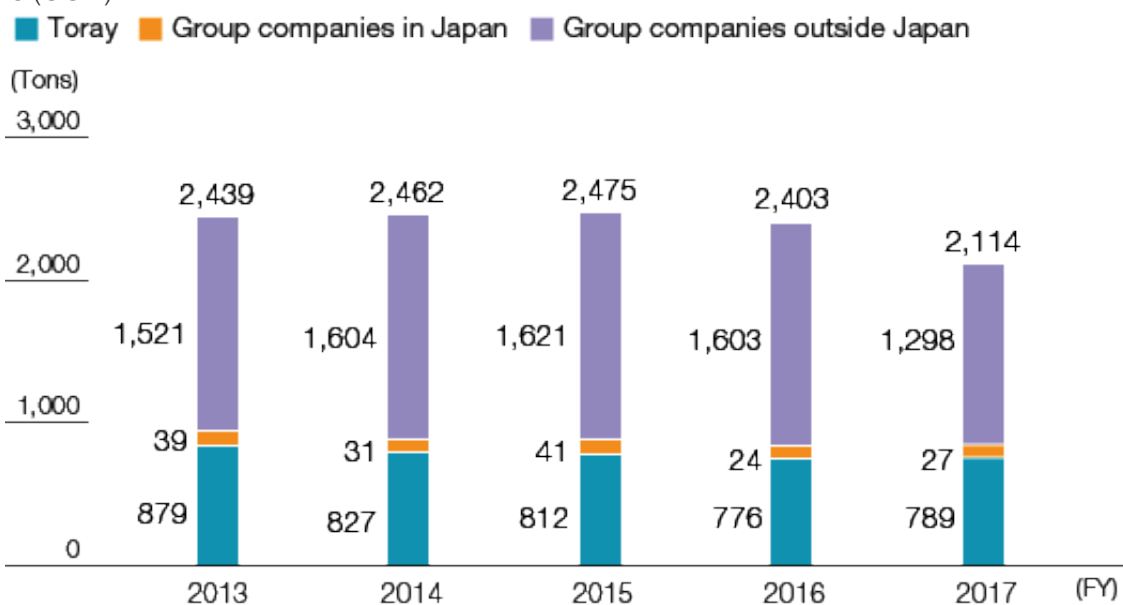
In fiscal 2017, the Toray Group recorded 777 tons of BOD emissions (down 16% year-on-year) and 2,114 tons of COD emissions (down 12% year-on-year). BOD and COD emissions were down due to enhanced wastewater treatment at Toray's Tokai Plant.

Another reason for the improvement in BOD and COD emissions was an upgrade to the method of operating wastewater treatment facilities at Toray's Ehime Plant and at the Gunsan Plant, which is operated by Toray Advanced Materials Korea, a group company outside Japan.

### Water Emissions (BOD)



### Water Emissions (COD)



The Group brings together wastewater managers every year to share and discuss strategies for enhancing wastewater management at production sites. The fiscal 2017 meeting was attended by 30 persons from nine Toray plants and two persons from one group companies in Japan.

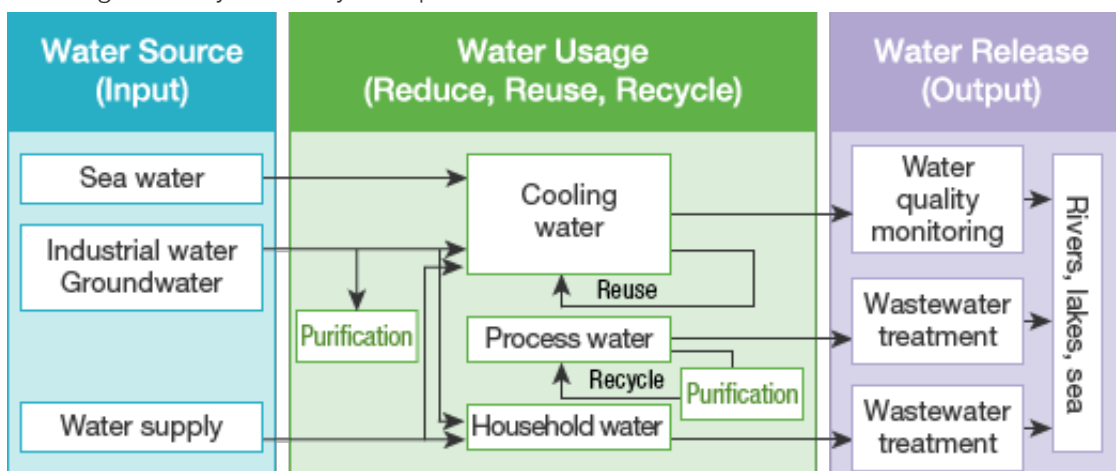
## Safety, Accident Prevention, and Environmental Preservation Initiatives for Managing Water Resources

The Toray Group is working to provide solutions to water resources problems around the world, based on the following policies. In its own operations, the Group effectively uses and recycles water and properly manages water resources.

1. The Toray Group recognizes that water is one of the most important resources for humanity, and that people are confronting problems related to water resources in many areas of the world.
2. The Toray Group is committed to helping to solve global water resources problems through its products, technologies and services.
3. The Toray Group continuously monitors the state of regional water resources, and conducts appropriate management of water resources according to the basic principle of sharing precious water resources with the local communities where the Group operates.

The Toray Group practices the 3Rs (reduce, reuse, recycle) in consuming water resources, and monitors the quality of water that is released into public bodies of water. Group companies outside Japan that are located in drought areas in particular recycle cooling water and wastewater and work to reduce the amount of industrial water used.

Water Resource Management by the Toray Group





## Water Usage Management

### Water usage per unit of sales

Reporting scope: Toray Group

Fiscal 2017 target:  
No more than 61% of 2001 level



**Result:**  
**54%**

The Toray Group used 228 million tons of water in fiscal 2017, an increase of 1% over the previous fiscal year. Compared to the amount used per unit of sales in fiscal 2001, set to an index value of 100, usage in fiscal 2017 was 54.0 points, down 5.5 points from the previous fiscal year. This improvement, despite the fact that the amount of water used was basically the same as the previous fiscal year, was due to the increase in Toray Group sales.

### Related Information

> [Environmental Data \(Water Usage\)](#)

#### Comparative Water Usage Per Unit of Sales (Toray Group)

(FY)	2001	2013	2014	2015	2016	2017
Comparative water usage per unit of sales	100	66.7	59.7	56.2	59.5	54.0

## Safety, Accident Prevention, and Environmental Preservation

# Initiatives to Reduce Waste

### Waste recycling rate

Reporting scope: Toray Group

Fiscal 2017 target:

At least 86%



Result:

**85.8%**

The Toray Group is carrying out zero emission initiatives as it works toward the realization of a sustainable, recycling-based world. Under the Fourth Medium-Term Environmental Plan, the Group worked to achieve its fiscal 2015 targets for rates of simply disposed waste,<sup>1</sup> landfill waste<sup>2</sup> and recycled waste,<sup>3</sup> which have been set as indicators for measuring progress toward attaining zero emissions.

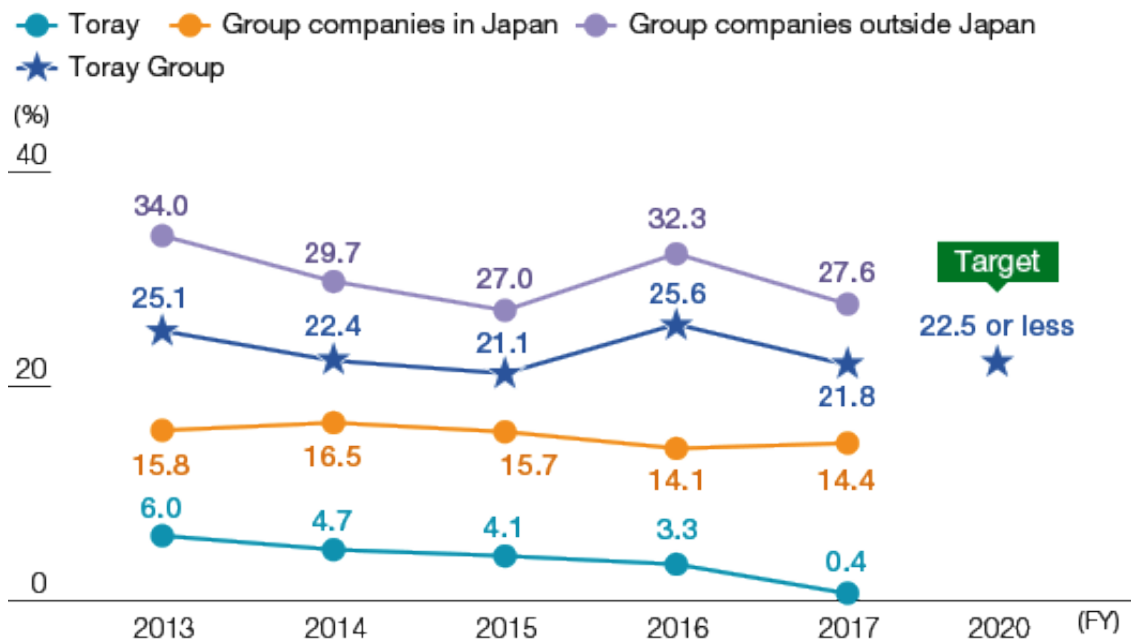
1. Simply disposed waste rate = (incineration + landfill) / total waste
2. Landfill waste rate = landfill waste / total waste
3. Recycling rate = (recycled resources + resources with monetary worth) / (total waste + resources with monetary worth)

## Results in Fiscal 2017

### Simply Disposed Waste Rate

Toray improved its simply disposed waste rate by 2.9 percentage points year-on-year to 0.4% due in part to the recycling of waste oil that now takes place at the Nagoya Plant. The rate for the Toray Group as a whole improved 3.8 points year-on-year to 21.8%, more than meeting the Group's 22.5% target. The Group will continue to work on bringing its simply disposed waste rate down.

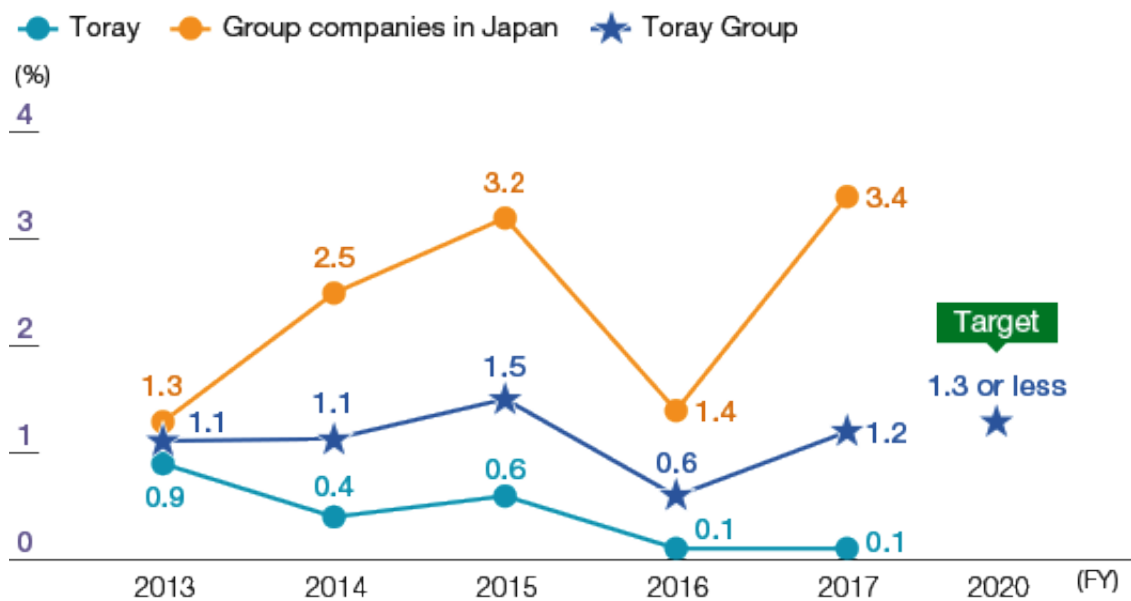
### Simply Disposed Waste Rate (Toray Group)



### Landfill Waste Rate

The rate of landfill waste at the Toray Group rose by 0.6 percentage points to 1.2% over the previous fiscal year due to the disposal of products necessitated by a leaking roof at a warehouse at a group company in Japan.

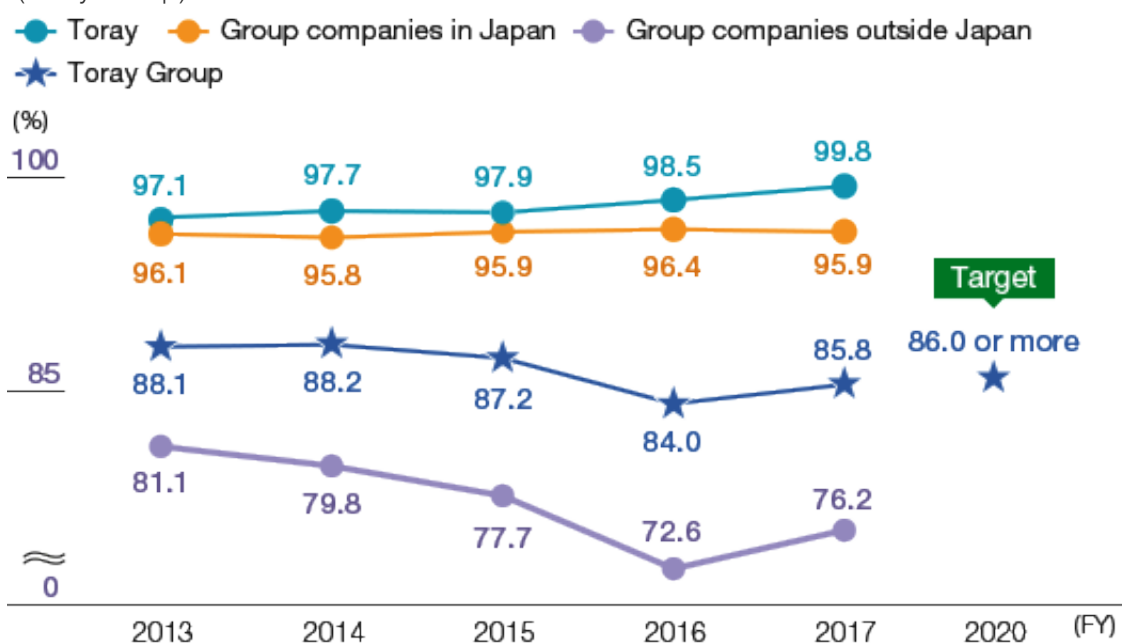
### Landfill Waste Rate (Toray and Its Group Companies in Japan)



# Recycling Rate

The Toray Group's recycling rate improved by 1.8 percentage points year-on-year to 85.8% as a result of efforts to promote recycling at Toray and its group companies outside Japan.

Recycling Rate (Toray Group)



## Zero Emissions Initiatives at Companies and Plants

The Toray Group considers a plant to have achieved zero emissions when the amount of simply disposed waste accounts for 1% or less of the total waste it generates. The Group works on its fiscal 2020 target of achieving zero emissions at 45 or more plants. In fiscal 2017, seven plants newly achieved zero emissions, but four plants that achieved it the previous year did not, bringing the total to 45 plants at 22 companies.

Companies and Plants with Zero Emissions Status in Fiscal 2017

Toray	Shiga Plant, Seta Plant, Ehime Plant, Nagoya Plant, Tokai Plant, Aichi Plant, Okazaki Plant, Mishima Plant, Chiba Plant, Tsuchiura Plant, Gifu Plant, Ishikawa Plant, Nasu Plant
Group companies in Japan	Ogaki Fuso Spinning Co., Ltd. [Fuso], Toray Coatex Co., Ltd., Maruichi Fiber Co., Ltd., Toray Monofilament Co., Ltd., Toray Hybrid Cord, Inc., Toray Engineering Co., Ltd. [Shiga, Seta], Toray Precision Co., Ltd., Dow Corning Toray Co., Ltd. [Chiba, Fukui, Komatsu], Soda Aromatic Co., Ltd. [Koriyama], Toray Opelontex Co., Ltd., Du Pont-Toray Co., Ltd., Toyo Plastic Seiko Co., Ltd. [Okazaki, Mishima, Koriyama], Toray Advanced Film Co., Ltd. [Nakatsugawa, Mishima, Takatsuki, Fukushima], Toray Fine Chemicals Co., Ltd. [Moriyama, Tokai, Matsuyama], Toray Medical Co., Ltd.
Group companies outside Japan	Toray Plastics (America), Inc. [Rhode Island], Toray Plastics (Shenzhen) Ltd., P.T. Toray Polytech Jakarta, Toray Chemical Korea Inc. [Anseong, Yugu], Toray Advanced Film Kaohsiung Co., Ltd, Toray Kusumgar Advanced Textile Private Limited

Note: Information in brackets refers to the names of the plants.

## Safety, Accident Prevention, and Environmental Preservation

# Environmental Risk Management

### Number of environmental accidents

Reporting scope: Toray Group

Fiscal 2017 target:

0



Result:

7

### Compliance with Environmental Laws and Accidents in Fiscal 2017

In fiscal 2017, seven environmental accidents occurred within the Toray Group, but all of them were modest infractions of regulatory values set by municipalities and had an extremely minor impact on the environment.

Most of these incidents involved the leak of chemical solutions outside of plants due to erroneous operation of equipment. To prevent recurrence of similar accidents, measures were taken to prevent the outflow of abnormal drainage to the plant discharge line. Steps were also taken to ensure thorough monitoring of water quality at the final exit of the plant discharge line. In addition, Toray Group companies implemented educational measures through training. The Group received three complaints and requests from residents near its facilities concerning noise and odor, which were seriously examined and addressed by implementing improvements.

#### Environmental Accidents and Related Incidents in Fiscal 2017 (Toray Group)

Administrative disposition due to violations of laws or ordinances <sup>1</sup>	0
Accidents (environmental accidents, etc.)	7
Slight but temporary exceeding of standard values <sup>2</sup>	0
Complaints/requests (noise, odor, etc.)	3

1. Includes improvement orders and fines. Improvement guidance and recommendations are included in accident figures.

2. No improvement guidance or recommendations were received from authorities, as there was no harm to the environment.

## Environmental Accidents in Fiscal 2017 (Toray Group)

Description of accidents	Cause and countermeasures
Leakage of chemical solutions (five cases)	Cause: Mistaken operation of valves, others Countermeasures: Reinforced monitoring to prevent leakage outside of plant, education and training
Scattering of chemical in powder form (one case)	Cause: Defects in temporary equipment Countermeasures: Reinforced monitoring to prevent leakage outside of plant, education and training
Gas emissions exceeded regulatory value (one case)	Cause: Insufficient confirmation when facility operations began Countermeasures: Reinforced monitoring to prevent leakage outside of plant, education and training

### Preventing Soil and Groundwater Pollution

The Toray Group constructs protective embankments around its facilities and storage tanks for hazardous chemicals, and takes precautions to ensure that none of these dangerous substances leak or discharge into the surrounding area or contaminate the soil onsite. In fiscal 2017, remediation using wells to clean up groundwater pollution continued at Toray Monofilament Co., Ltd., and remediation to address soil pollution continued at Toray's Nagoya Plant.

In addition to these ongoing remediation efforts, the Toray Group voluntarily implements regular surveys to monitor soil and groundwater pollution. Should any pollution be identified through these surveys, rules are in place to ensure that immediate action is taken to remediate the pollution.

## Safety, Accident Prevention, and Environmental Preservation

# Environmental Accounting

### Fiscal 2017 Environmental Accounting Report (Toray)

Toray has been practicing environmental accounting since 1999, to track investments and gauge their cost effectiveness.

In fiscal 2017, Toray's environment-related investment amounted to 2.02 billion yen, up 0.66 billion yen compared to the previous year. Cost totaled 6.81 billion yen, up 0.10 billion yen compared to the previous year.

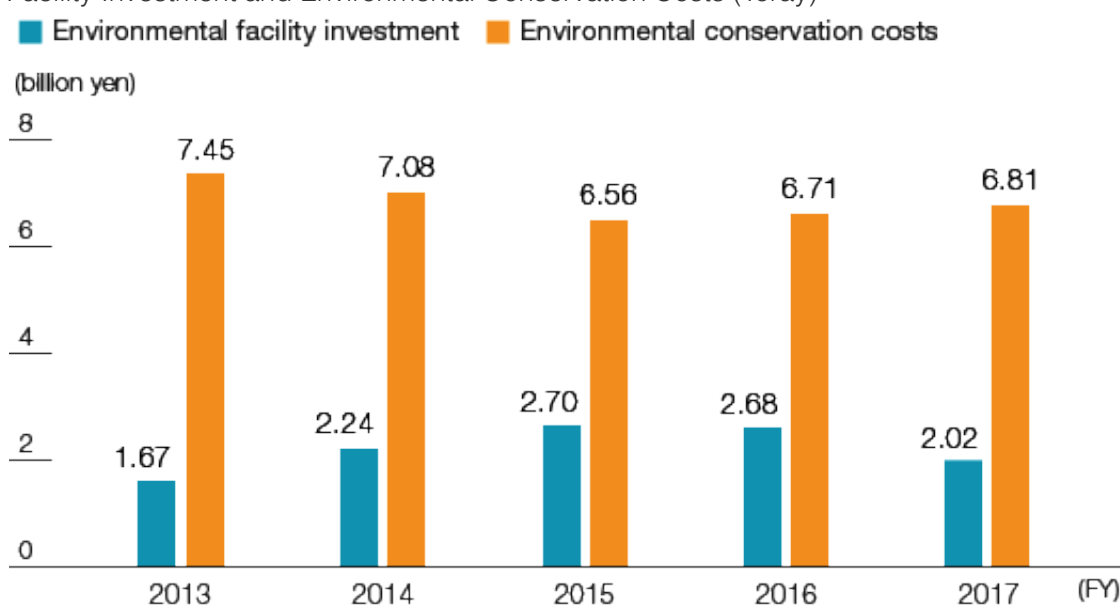
#### Fiscal 2017 Environmental Accounting Report (Toray)

Expenses				
Item		Subcategory and description	Investment (million yen)	Cost (million yen)
Business area costs	Pollution prevention costs	Air (including CFC countermeasures)	472	1,804
		Water quality	739	2,390
		Noise and vibration	38	8
		Greening	4	301
		Odors and other	277	164
	Global environment conservation costs	Energy conservation and combating global warming	448	-
	Resource recycling costs	Industrial waste reduction, recycling, disposal, and PCB waste disposal services	39	1,414
Upstream and downstream costs		Product recycling	0	2
		Container and package recycling	0	1
Management activity costs		Indirect labor costs, ISO certification and maintenance, environmental communications, and education	0	449

Social initiative costs	Regional initiatives, support for organizations, etc.	0	85
Environmental remediation costs	SOx fines, soil purification, etc.	0	192
Total		2,017	6,810

Effectiveness		
Item		Amount (million yen)
Financial effects	Reduction in energy costs	114
	Reduction in industrial waste disposal costs	43
	Sale of valuable recycled resources with monetary value	370
Quantitative environmental effects	Reduction of greenhouse gas emissions	6,800 tons-CO <sub>2</sub> eq

Environmental Facility Investment and Environmental Conservation Costs (Toray)



### Facility Investment in Safety, Health, Accident Prevention, and Environmental Preservation Projects (Toray Group)

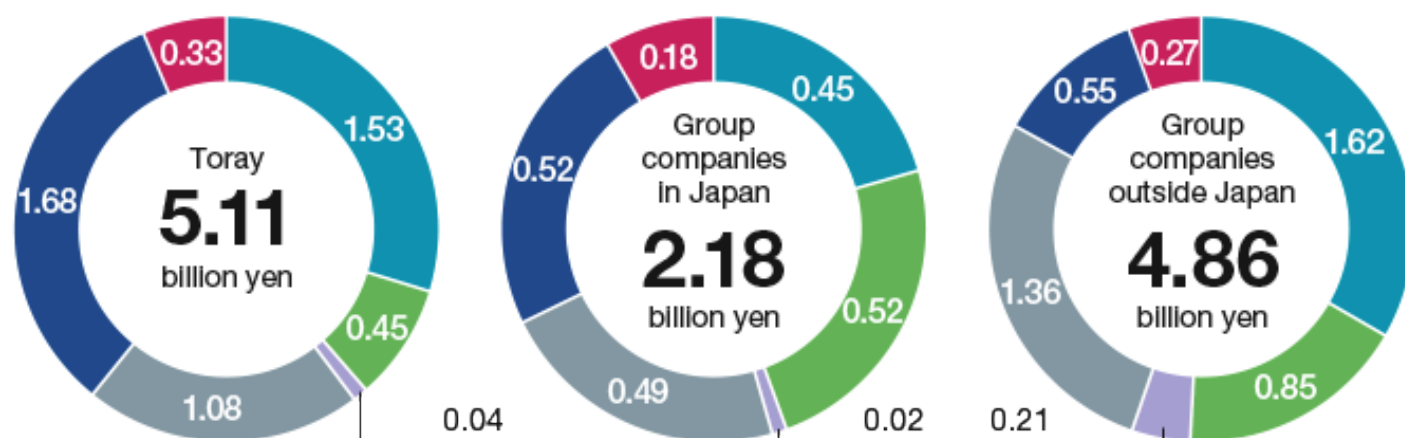
The Toray Group reports on facility investments relating to safety, health, accident prevention, and environmental preservation projects. Continuous investments included equipment security upgrades and upgrading fire protection and fire extinguishing equipment. Investments in environmental preservation included the installation of improving gas



emissions and wastewater treatment facilities.

Fiscal 2017 Facility Investment in Safety, Health, Accident Prevention, Environmental Preservation, and Energy Conservation Projects (Toray Group)

■ Environmental preservation ■ Energy conservation ■ Waste treatment and reduction  
 ■ Safety ■ Accident Prevention ■ Health



### Toray Environmental Accounting Standards

- Some categories were changed based on the Ministry of the Environment's Guidelines for FY2005.
- Only economic effects that can be determined with a high degree of certainty are included in the calculation. Presumed effects are not included.
- Capital investment also includes facility investments for which environmental preservation is not the main objective. Capital investment resulting from leases is also included. Expenses include labor costs and depreciation. However, internal labor costs related to local volunteer activities are not included.
- Energy cost reduction figures show the amount of reduction for the 12 months after the completion of an energy conservation facility. Expenses are not recorded as they are deducted when the effect is calculated.
- Waste disposal cost reduction figures show the amount of reduction achieved through waste reduction efforts and resource recycling for 12 months after the measures are undertaken.
- Effects of reducing greenhouse gas emissions are measured over a 12-month period following the completion of measures or facilities to conserve energy.

## Safety, Accident Prevention, and Environmental Preservation

# Biodiversity Initiatives

The Toray Group views conservation of biodiversity as a critical global environmental issue that is of equal importance to reducing greenhouse gas emissions. The Group analyzes the impact of its business activities on biodiversity and strives to help build a more sustainable world.

### Working Group Considers Initiatives for Biodiversity

The Toray Group pursues biodiversity initiatives under a three-year action road map and sets its priorities under the Toray Group Biodiversity Basic Policy. In fiscal 2017, the Group implemented initiatives under the third road map, which runs from fiscal 2016 to fiscal 2018.

#### **Biodiversity Initiatives** Adopted December 2010

##### **Basic Concept**

Toray Group appreciates the gifts of nature that biodiversity provides, and strives to realize the conservation and sustainable use of biodiversity. The Group contributes to society through the development and dissemination of products and technologies which advance conservation of biodiversity.

##### **Action Guidelines**

1. We take into consideration the impact of our business activities on biodiversity, and strive to realize the conservation and sustainable use of biodiversity.
2. We endeavor to develop environmentally friendly technologies and products, and contribute to the conservation of biodiversity by making them available for use.
3. We practice fair use of genetic resources on the basis of relevant international agreements.
4. We recognize the influence of biodiversity within the supply chain, and pursue coexistence with nature.
5. We strive to raise employee awareness on biodiversity, and contribute to the building of a society that nurtures biodiversity through our communication with stakeholders.

Note: Toray Group respects Nippon Keidanren's Declaration of Biodiversity (Guide to Action Policies) and the Japanese Ministry of the Environment's Guidelines for Private Sector Engagement in Biodiversity. The Group is a promotion partner of Nippon Keidanren's Declaration of Biodiversity.

## Procuring Raw Materials

The Toray Group conducted a survey of all products to determine the usage of bio-based raw materials in product manufacturing. The Group developed rules for checking the biodiversity impacts of products in fiscal 2015, and has applied the rules to all products.

## Social Initiatives

Affirming the purposes of the Japan Committee for the United Nations Decade on Biodiversity,<sup>1</sup> Toray donated 100 books for children recommended by the Committee to the Shiga Prefectural Library in March 2018. Toray hopes that children, by reading, will enjoy learning about the importance of nature and the relationship between people and nature.

1. The committee has selected picture books and pictorial books for the “Bookshelf of Biodiversity—100 Books Connecting People to Living Nature” to promote the idea of biodiversity.



Donated books to the Shiga Prefectural Library

## Increasing Green Areas

### Number of companies and plants developing greenery policy and plan

Reporting scope: Toray Group

Fiscal 2017 target:

at least 45



Result:

49

Plants at Toray and its group companies in Japan are operating greenery policies and plans through 2020, guided by the Toray Group Basic Policy for Increasing Green Areas.<sup>2</sup> The plans encompass initiatives to conserve green areas, including natural forests<sup>3</sup> that have been protected since the plants began operating. Sustainable greenery conservation initiatives also help to conserve the environment for communities.

2. Toray Group Basic Policy on Increasing Green Areas was established in 2012, evolving out of greenery policies that were first established in 1973.
3. Natural groves or forestation by species based on potential native vegetation



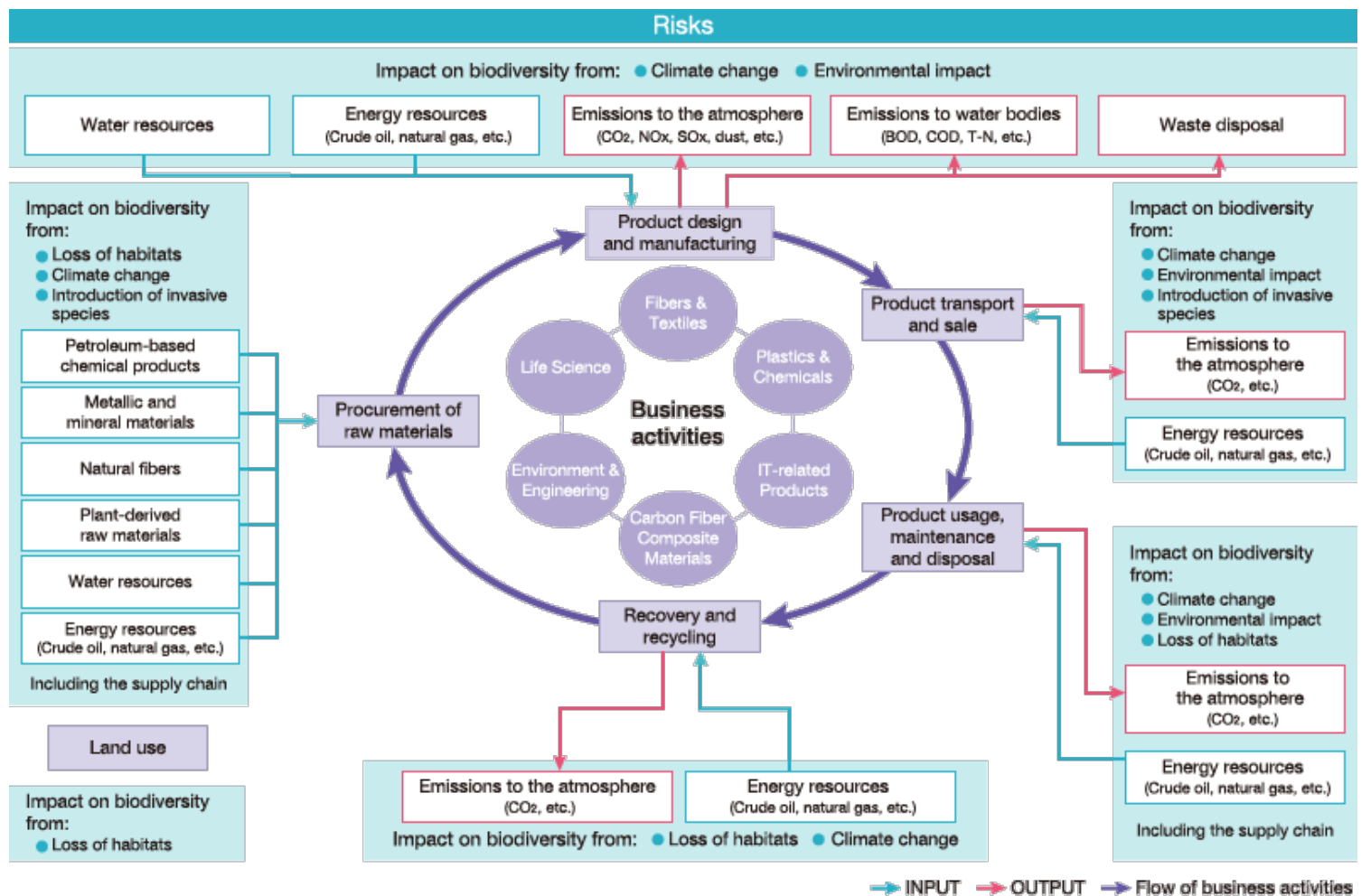
Forested area on the premises of Okayama Chemical Industry & Co., Ltd.

## Toray Group's Basic Policy for Increasing Green Areas Established June 2012

- Toray Group contributes to the preservation of the natural environment by promoting tree planting using planting methods suitable for the biodiversity of local habitats.
- Toray Group aims to surround its production plants with greenery by giving priority to tree planting in areas at the boundaries of factory sites.
- Toray Group sets goals for making each of its production plants greener while considering how to attain harmony with the surrounding environment as well as regulations concerning green space ratios in each respective country or region.

## Toray Group's Approach to the Relationship between Corporate Activities and Biodiversity

Starting from the procurement of raw materials, the entire lifecycle of the Toray Group's business activities has a wide range of effects on biodiversity. The two diagrams below conceptualize the relationship between the Group's business activities and biodiversity in terms of the two aspects of risks and opportunities.



Note: These diagrams were produced based on the Map of Corporate Activities and Biodiversity® published by the Japan Business Initiative for Biodiversity.

# Opportunities

Contribute to biodiversity by:

- Protecting habitats
- Curbing global warming
- Reducing environmental impact

Contribute to biodiversity by:

- Curbing global warming
- Reducing environmental impact

Environmentally friendly design

Reduction of CO2 emissions

Appropriate usage of water resources

Zero emissions

Reduction of CO2 emissions

Reduction of energy resources consumption (Crude oil, natural gas, etc.)

Contribute to biodiversity by:

- Protecting habitats
- Curbing global warming
- Reducing environmental impact

Green purchasing and procurement

Utilization of renewable energies

Appropriate usage of water resources

Including the supply chain

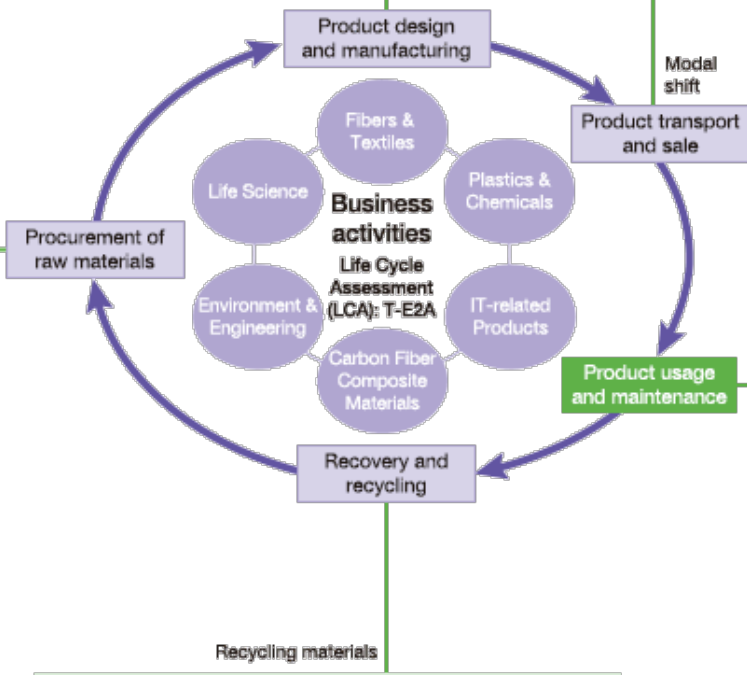
Social contribution activities

Contribute to biodiversity

Increasing green areas

Contribute to biodiversity by:

- Helping preserve regional biodiversity
- Protecting habitats
- Curbing global warming



Contribute to biodiversity by:

- Curbing global warming
- Protecting habitats

Reduction of CO2 emissions

Energy resources (Crude oil, natural gas, etc.)

Contribute to biodiversity by:

- Curbing global warming
- Reducing environmental impact
- Protecting habitats

Reduction of CO2 emissions

Energy resources (Crude oil, natural gas, etc.)

Examples of key products that contribute to the protection of biodiversity

Lightening material weight to reduce CO2 emissions during usage, thereby helping curb global warming



CFRP for aircraft structure



CFRP for automotive materials

Utilizing renewable energies to reduce environmental impact



PET film for solar panel backsheets



CFRP for wind power generation blades

Increasing green areas to protect habitats



Encouraging plant growth on mine tailings (biodegradable products)



Water treatment membranes for seawater desalination plants

## Safety, Accident Prevention, and Environmental Preservation

# Environmental Impact Overview

Environmental Impact Overview (PDF:91KB) [PDF](#)

### Environmental Impact Overview Fiscal 2017

	Toray			Group companies in Japan			Group companies outside Japan		
	FY2016	FY2017	Compared to previous year (%)	FY2016	FY2017	Compared to previous year (%)	FY2016	FY2017	Compared to previous year (%)
<b>INPUT</b>									
Energy (1,000,000 gigajoules)	27.9	29.0	3.9	7.2	6.5	-9.7	52.0	50.8	-2.3
Water usage (1,000,000 tons)	168	174	3.6	13	13	0.0	44	41	-6.8
<b>OUTPUT</b>									
<b>GHG (10,000 tons CO<sub>2</sub>eq)</b>									
6 gases including CO <sub>2</sub>	201	203 <sup>*1</sup>	-1.0	45	40	-11.1	315	304	-3.5
<b>PRTR Law-specified substances (tons)</b>									
Atmospheric emissions	189	330	74.6	245	101	-58.8	318	442	39.0
Water emissions	31	27	-12.9	0	0	0.0	0	0	0.0
Waste transfers	866	1,023	18.1	1,246	1,554	24.7	9,960	7,628	-23.4
<b>Air pollutants (tons)</b>									
SO <sub>x</sub>	264	268	1.5	20	16	-20.0	3,090	2,192	-29.0
NO <sub>x</sub>	1,332	1,335	0.2	51	40	-21.6	768	716	-6.8
Dust	105	103	-1.9	3	1	-66.7	235	122	-48.1
<b>Industrial wastewater (1,000,000 tons)</b>									
	159	164	3.1	10	10	-3.0	25	24	-4.0
<b>Water pollutants (tons)</b>									
BOD	655	576	-12.1	27	24	-11.1	245	177	-27.6

COD	776	<b>789</b>	1.7	24	<b>27</b>	12.5	1,603	<b>1,298</b>	-19.0
Nitrogen	406	<b>415</b>	2.3	14	<b>14</b>	0.0	—	—	—
Phosphorus	27	<b>25</b>	-7.1	1	<b>1</b>	0.0	—	—	—
<b>Waste (1,000 tons)</b>									
Recycled	29.0	<b>32.4</b>	11.7	14.5	<b>14.7</b>	1.4	89.0	<b>101.7</b>	14.3
Incinerated and other	0.9	<b>0.1</b>	-88.9	2.1	<b>1.9</b>	-9.5	17.6	<b>16.6</b>	-5.7
Direct landfill disposal	0.0	<b>0.0</b>	0.0	0.2	<b>0.6</b>	200.0	24.4	<b>24.1</b>	-1.2
<b>Coal ash (1,000 tons)</b>									
Recycled	62.4	<b>57.8</b>	-7.4	—	—	—	17.2	<b>19.1</b>	11.0
Direct landfill disposal	2.0	<b>1.9</b>	-5.0	—	—	—	0.4	<b>0.2</b>	-50.0

Note: Corrected a data tabulation error in the 2016 CSR Report.

1. Toray greenhouse gas emissions have obtained a third-party guarantee from Lloyd's Register Quality Assurance Limited (LRQA).

#### Index of Environmental Impact Per Unit of Sales

	Toray and its group companies in Japan			Group companies outside Japan			Total		
	FY2016	FY2017	Year-on-year comparison(points)	FY2016	FY2017	Year-on-year comparison(points)	FY2016	FY2017	Year-on-year comparison(points)
GHG emissions	64.8	<b>62.1</b>	-2.7	74.2	<b>59.5</b>	-14.7	76.4	<b>67.8</b>	-8.6
PRTR atmospheric emissions	28.2	<b>27.2</b>	-1.0	27.4	<b>31.1</b>	3.7	28.3	<b>29.7</b>	1.4
SOx emissions	4.6	<b>4.5</b>	-0.1	16.8	<b>10.5</b>	-6.3	18.0	<b>12.6</b>	-5.4
Water usage volume	70.9	<b>70.4</b>	-0.5	53.7	<b>41.1</b>	-12.6	59.5	<b>54.0</b>	-5.5
BOD emissions	40.9	<b>34.8</b>	-6.1	22.4	<b>13.3</b>	-9.1	33.3	<b>25.1</b>	-8.2
Landfilled waste volume	5.3	<b>11.2</b>	5.9	52.9	<b>47.7</b>	-5.2	73.1	<b>73.6</b>	0.5

Note: The amounts per unit of sales shown in the table are referenced to an index value of 100 set for the base year of fiscal 2001.

## Aggregate Environmental Impact Data by Company Type and Location

	<b>Toray</b>	<b>Group companies in Japan</b>	<b>Group companies outside Japan</b>
GHG	All 13 plants and 1 research laboratory	51 plants at 25 companies	73 plants at 52 companies
PRTR Law-specified substances	All 13 plants and 1 research laboratory	50 plants at 25 companies	73 plants at 52 companies
SOx, NOx, dust	All 13 plants and 1 research laboratory	43 plants at 23 companies	73 plants at 52 companies
BOD	All 13 plants and 1 research laboratory	43 plants at 23 companies	73 plants at 52 companies
COD <sup>2</sup>	13 plants and 1 research laboratory	43 plants at 23 companies	73 plants at 52 companies
Nitrogen and phosphorus	All 13 plants and 1 research laboratory	43 plants at 23 companies	-
Waste	All 13 plants and 1 research laboratory	50 plants at 25 companies	73 plants at 52 companies

2. COD figures for Toray, group companies in Japan and Korea are given in COD<sub>mn</sub> (using the potassium permanganate method). Other group companies outside Japan are given in COD<sub>cr</sub> (using the potassium dichromate method).



Safety, Accident Prevention, and Environmental Preservation

# Chemical Substance Emissions and Transfer Data<sup>4</sup> • <sup>5</sup>

[Chemical Substance Emissions and Transfer Data \(PDF:56KB\)](#) [PDF](#)

PRTR Law-Specified Substance<sup>6</sup> Emissions and Transfer Data for Fiscal 2017

6. Chemical substances designated Class 1 under the April 2010 revision of Japan's PRTR Law

Toray	Tons (dioxins: mg-TEQ)			
	Atmospheric emissions	Water emissions	Soil emissions/company landfill	Waste transfers
Methyl acrylate	0.3	0.3	0.0	0.0
Acrylonitrile	20.7	2.9	0.0	578.4
Acetaldehyde	3.0	0.0	0.0	0.0
Antimony and antimony compounds	0.0	0.0	0.0	0.5
Asbestos	0.0	0.0	0.0	2.2
Ethylbenzene	6.1	0.0	0.0	0.0
ε-Caprolactam	0.0	13.7	0.0	0.0
Xylene	3.6	0.0	0.0	0.0
Chlorobenzene	0.9	0.0	0.0	18.4
Chloroform	2.6	0.0	0.0	8.1
Cobalt and cobalt compounds	0.0	0.0	0.0	2.1
4,4'-diaminodiphenyl ether	0.0	0.0	0.0	0.2
Inorganic cyanide	38.8	0.0	0.0	0.0

<b>1,4-Dioxane</b>	0.0	2.2	0.0	2.4
<b>Diuron</b>	0.0	0.0	0.0	1.8
<b>Dichlorobenzene</b>	10.8	0.0	0.0	1.4
<b>Dichloromethane</b>	160.3	0.0	0.0	2.0
<b>N, N-dimethylacetamide</b>	1.1	0.0	0.0	1.8
<b>N, N-dimethylformamide</b>	6.0	0.5	0.0	196.3
<b>Styrene</b>	13.0	0.0	0.0	1.6
<b>Terephthalic acid</b>	0.0	0.0	0.0	36.6
<b>Dimethyl terephthalate</b>	0.0	0.0	0.0	3.5
<b>Trichloroethylene</b>	0.4	0.6	0.0	0.3
<b>Toluene</b>	7.7	0.0	0.0	50.8
<b>Nitrobenzene</b>	0.0	0.0	0.0	20.1
<b>Hydrazine</b>	0.0	0.1	0.0	0.0
<b>Pyridine</b>	0.0	0.0	0.0	1.1
<b>O-, m- and p-Phenylenediamine</b>	0.0	2.1	0.0	0.0
<b>Phenol</b>	0.0	3.2	0.0	0.0
<b>Bromomethane</b>	48.3	0.0	0.0	0.0
<b>n-hexane</b>	0.0	0.0	0.0	1.1
<b>N-methylpyrrolidone</b>	0.0	0.0	0.0	15.6
<b>Benzene</b>	1.5	0.7	0.0	0.0
<b>Poly (oxyethylene) alkyl ether</b>	0.8	0.0	0.0	10.4
<b>Formaldehyde</b>	0.1	0.0	0.0	0.0
<b>Manganese and manganese compounds</b>	0.0	0.3	0.0	1.5
<b>Methacrylic acid 2,3-Epoxypropyl</b>	0.0	0.0	0.0	2.7

<b>Methyl methacrylate</b>	4.2	0.0	0.0	12.9
<b>Methylenebis (4,1-phenylene) diisocyanate</b>	0.0	0.0	0.0	37.5
<b>Lead and lead compounds</b>	0.0	0.0	0.0	2.1
<b>Nickel and nickel compounds</b>	0.0	0.0	0.0	8.9
<b>Dioxins</b>	0.3	10.0	0.0	22.0
<b>Total</b>	<b>330.3</b>	<b>26.6</b>	<b>0.0</b>	<b>1022.2</b>

4. The list shows emissions and transfers of 41 substances (out of Toray's 64 PRTR Law-specified substances) exceeding 50 kg and dioxins.

<b>Group companies in Japan</b>	<b>Tons (dioxins: mg-TEQ)</b>			
	<b>Atmospheric emissions</b>	<b>Water emissions</b>	<b>Soil emissions/company landfill</b>	<b>Waste transfers</b>
<b>Acetonitrile</b>	0.1	0.0	0.0	20.5
<b>1-Allyloxy-2,3-epoxy propane</b>	0.0	0.0	0.0	5.0
<b>Ethylbenzene</b>	11.8	0.0	0.0	31.1
<b>Ethylene oxide</b>	1.4	0.0	0.0	0.0
<b>Ethylene glycol monoethyl ether</b>	0.2	0.0	0.0	0.4
<b>Epichlorohydrin</b>	0.0	0.0	0.0	3.6
<b>Xylene</b>	9.9	0.0	0.0	21.5
<b>p-Chloronitrobenzene</b>	0.0	0.0	0.0	0.1
<b>1-chloro-2,4-dinitrobenzene</b>	0.0	0.0	0.0	1.0
<b>Ethylene glycol monoethyl ether acetate</b>	0.0	0.0	0.0	0.1
<b>Ethyl acetate</b>	1.7	0.0	0.0	0.5
<b>1,2-dichloroethane</b>	0.0	0.1	0.0	0.0

Dichloromethane	3.9	0.0	0.0	20.5
N, N-dimethylacetamide	17.9	0.0	0.0	409.4
N, N-dimethylformamide	14.9	0.0	0.0	87.3
Styrene	0.3	0.0	0.0	0.3
Toluene	36.5	0.0	0.0	730.3
1,2,3-Trichloropropane	0.0	0.0	0.0	0.7
Carbon disulfide	0.2	0.1	0.0	0.0
1-nonanol	0.0	0.0	0.0	2.6
Hydroquinone	0.0	0.0	0.0	1.1
Bis (2-ethylhexyl) phthalate	0.0	0.0	0.0	28.6
n-hexane	1.4	0.0	0.0	57.9
Poly (oxyethylene) alkyl ether	0.0	0.0	0.0	51.2
Formaldehyde	0.2	0.0	0.0	0.1
Maleic anhydride	0.0	0.0	0.0	1.8
Methacrylate acid	0.0	0.0	0.0	10.8
Methyl methacrylate	0.1	0.0	0.0	6.0
$\alpha$ -methylstyrene	0.0	0.0	0.0	0.4
Methylpyridine	0.7	0.0	0.0	60.9
Molybdenum and molybdenum compounds	0.0	0.0	0.0	0.4
Dioxins	0.3	0.2	0.0	18.4
<b>Total</b>	<b>101.3</b>	<b>0.3</b>	<b>0.0</b>	<b>1,554.2</b>

5. The list shows emissions and transfers of 31 substances (out of the 62 PRTR Law-specified substances for group companies in Japan) exceeding 50 kg and dioxins.

## Safety, Accident Prevention, and Environmental Preservation

# Sites with ISO 14001 Certification

Sites with ISO 14001 Certification (as of March 2018)

### Toray: All 13 plants

Shiga, Seta, Ehime, Nagoya, Tokai, Aichi, Okazaki, Mishima, Chiba, Tsuchiura, Gifu, Ishikawa, Nasu

### Group companies in Japan: 35 plants at 21 companies<sup>1</sup>

Du Pont-Toray Co., Ltd. [Tokai], Toray Opelontex Co., Ltd., Toray Textiles, Inc. [Tokai], Toray Coatex Co., Ltd. [Kyoto, Chemical Products], Toray Hybrid Cord, Inc., Toyo Plastic Seiko Co., Ltd. [Mishima, Koriyama], Toray PEF Products Inc. [Konan], Toray Monofilament Co., Ltd., Toray Advanced Film Co., Ltd. [Mishima, Takatsuki, Fukushima, Nakatsugawa], Toray KP Films Inc., Toray Fine Chemicals Co., Ltd. [Moriyama, Matsuyama, Tokai, Chiba], Toray Engineering Co., Ltd. [Numazu], Soda Aromatic Co., Ltd. [Noda, Koriyama, Okayama Chemicals], Toray Amenity and Civil Engineering Co., Ltd. [Ehime, Fukushima], Dow Corning Toray Co., Ltd. [Chiba, Fukui, Yamakita, Komatsu], Suido Kiko Kaisha, Ltd., Toray Medical Co., Ltd., Ichimura Sangyo Co., Ltd., Toray International, Inc., Ltd., Chori Co., Ltd., Toray Carbon Magic Co., Ltd.

1. In addition, 12 companies received certification as affiliated companies on Toray sites.
2. Information in brackets refers to the names of the plants.
3. Companies or plants that had acquired ISO14001 certification before joining Toray Group are listed as ISO14001-certified organizations, not as organizations which newly acquired ISO14001 certification in fiscal 2017. Toray Battery Separator Film Co., Ltd. has been counted as Toray Nasu Plant since fiscal 2017.

### Group companies outside Japan: 57 plants at 42 companies

#### USA

Toray Plastics (America), Inc. [Rhode Island, Virginia], Toray Resin Co., Toray Fluorofibers (America), Inc., Toray Composite Materials America, Inc., Toray Membrane USA, Inc.

#### UK

Toray Textiles Europe Ltd.

#### France

Toray Films Europe S.A.S., Toray Carbon Fibers Europe S.A., Toray Carbon Fibers Europe [Lacq]<sup>4</sup>

## **Germany**

Euro Advanced Carbon Fiber Composites GmbH, Greenerity GmbH

## **Italy**

Alcantara S.p.A., Delta-Tech S.p.A.

## **Czech Republic**

Toray Textiles Central Europe s.r.o.

## **Hungary**

Zoltek Companies, Inc. (Hungary)

## **Indonesia**

P.T. Century Textile Industry Tbk, P.T. Easterntex, P.T. Indonesia Toray Synthetics, P.T. Acryl Textile Mills, P.T. Indonesia Synthetic Textile Mills, P.T. Toray Polytech Jakarta

## **Thailand**

Thai Toray Textile Mills Public Company Limited, Thai Toray Synthetics Co., Ltd. [Bangkok, Ayutthaya, Nakhonpathom], Luckytex (Thailand) Public Company Limited [Mill 1, Mill 2, Mill 3]

## **Malaysia**

Penfibre Sdn. Berhad, Penfabric Sdn. Berhad [Mill 1, Mill 2, Mill 3, Mill 4], Toray Plastics (Malaysia) Sdn. Berhad

## **China**

Toray Fibers (Nantong) Co., Ltd., Toray Sakai Weaving & Dyeing (Nantong) Co., Ltd., Toray Plastics (Shenzhen) Ltd., Toray Film Products (Zhongshan) Ltd., Toray Plastics Precision (Zhongshan) Ltd., Toray Plastics (Suzhou) Co., Ltd., Toray Fibers & Textiles Research Laboratories (China) Co., Ltd., Toray Advanced Materials Research Laboratories (China) Co., Ltd., Toray Polytech (Nantong) Co., Ltd., Toray BlueStar Membrane Co., Ltd., Toray Plastics (Chengdu) Co., Ltd.

## **Republic of Korea**

Toray Advanced Materials Korea Inc. [Mill 1, Mill 2, Mill 3], STEMCO, Ltd., Toray Chemical Korea Inc. [Mill 1, Mill 2, Mill 3, Mill 4], Toray Battery Separator Film Korea, Ltd.

## **Taiwan**

Toray Advanced Film Kaohsiung Co., Ltd.

4. Companies and plants that newly acquired ISO14001 certification in fiscal 2017.

Safety, Accident Prevention, and Environmental Preservation

# Environmental Data for Toray and Principal Group Companies

Environmental Data for Toray and Principal Group Companies (PDF:128KB) [PDF](#)

Environmental Data for 13 Toray Plants and Principal Group Companies

	Emission volume														Principal manufactured products
	GHG emissions	PRTR				Gas emissions			Water emissions			Waste			
		Emissions			Waste transfers	SOx	NOx	Dust	BOD	COD	Water	Recycled	Simple incineration	Landfill disposal	
		Air	Water	Soil & landfill											
10,000 tons CO <sub>2</sub> /year	tons/year	tons/year	tons/year	tons/year	tons/year	tons/year	tons/year	tons/year	tons/year	million m <sup>3</sup> /year	tons/year	tons/year	tons/year		
Shiga Plant	9.2	3	0	0	42	0	36	5	45	70	22.3	3,822	15	0	<ul style="list-style-type: none"> <li>• Base material of ultrasuede™ man-made suede</li> <li>• LUMIROR™ polyester film</li> <li>• OPTICAL™ color filter</li> <li>• TORAYVINO™ home water purifier</li> </ul>
Seta Plant	0.2	0	0	0	0	0	0	0	0	0	0.1	68	0	0	<ul style="list-style-type: none"> <li>• TORAYLON™ acrylic fiber</li> <li>• Medical devices (Inoue Balloon catheters, ANTHRON™ P-U catheters)</li> </ul>
Ehime Plant	65.5	58	7	0	770	253	719	87	44	119	30.4	6,958	24	0	<ul style="list-style-type: none"> <li>• TORAY TETORON™ polyester staple fiber</li> <li>• TORAYCA™ carbon fiber</li> <li>• ROME-MBRA™ reverse osmosis membrane</li> </ul>


															<ul style="list-style-type: none"> <li>• TORAY-CON™ PBT resin</li> </ul>
Nagoya Plant	9.8	20	0	0	14	0	52	2	87	119	30.2	3,700	12	12	<ul style="list-style-type: none"> <li>• AMILAN™ nylon resin</li> <li>• TORAY-CON™ PBT resin</li> <li>• Various fine chemicals</li> </ul>
Tokai Plant	67.9	53	19	0	29	10	356	3	351	371	18.9	7,059	50	0	<ul style="list-style-type: none"> <li>• Caprolactam</li> <li>• Terephthalic acid</li> <li>• TORAY TETORON™ polyester chips</li> <li>• TORELINA™ PPS resin</li> </ul>
Aichi Plant	2.3	0	0	0	12	0	2	0	3	-	1.7	259	1	0	<ul style="list-style-type: none"> <li>• Nylon filament yarn</li> <li>• RAYTELA™ plastic optical fiber</li> </ul>
Okazaki Plant	8.7	5	0	0	71	0	44	3	10	19	3.7	1,974	3	3	<ul style="list-style-type: none"> <li>• Nylon filament yarn</li> <li>• TORAY WATERLESS PLATE™ printing plate</li> <li>• Filtryzer™ hemodialyzers</li> <li>• TORAY-VINO™ home water purifier</li> </ul>
Mishima Plant	14.3	3	0	0	28	3	68	0	13	20	35.8	1,023	2	1	<ul style="list-style-type: none"> <li>• LUMIROR™ polyester film</li> <li>• TORAY TETORON™ polyester filament yarn</li> <li>• DORNER™ oral administration prosta-cyclin PGI2 derivative</li> <li>• FERON™ natural interferon-β preparation</li> </ul>



Chiba Plant	2.0	26	0	0	2	0	10	0	5	55	4.0	2,835	16	8	<ul style="list-style-type: none"> <li>• TOYOLAC™ ABS resin</li> </ul>
Tsuchiura Plant	1.6	0	0	0	0	0	4	0	1	-	0.3	382	0	0	<ul style="list-style-type: none"> <li>• TORAY-FAN™ BO polypropylene film</li> </ul>
Gifu Plant	8.3	1	0	0	36	0	23	1	9	10	10.3	869	0	0	<ul style="list-style-type: none"> <li>• ultrasuede™ man-made suede</li> <li>• LUMI-RROR™ polyester film</li> <li>• TORE-LINA™ PPS film</li> </ul>
Ishikawa Plant	7.2	4	0	0	3	3	12	0	4	5	6.2	1,676	6	2	<ul style="list-style-type: none"> <li>• TORAY TETORON™ polyester filament yarn</li> <li>• Nylon filament yarn</li> <li>• TORAY-CA™ prepreg</li> </ul>
Nasu Plant	4.7	159	0	0	16	0	7	2	0	0	0.2	1,686	5	0	<ul style="list-style-type: none"> <li>• Lithium-ion rechargeable battery</li> </ul>
Toray Hybrid Cord, Inc.	1.6	2	0	0	1	0	1	0	5	7	1.2	359	0	0	<ul style="list-style-type: none"> <li>• Tire cord</li> <li>• Carpet pile fiber</li> </ul>
Toray Advanced Film Co., Ltd. [Mishima]	0.6	1	0	0	39	0	1	0	0	0	0.4	433	1	1	<ul style="list-style-type: none"> <li>• CER-APEEL™ Release film</li> <li>• LUMI-SOLAR™ PV-back sheet</li> </ul>
Malaysia Penfibre Sdn. Berhad [Fibers & Textiles]	5.0	0	0	0	0	1	1	17	0	5	0.2	132	70	41	<ul style="list-style-type: none"> <li>• TORAY TETORON™ polyester staple fiber</li> </ul>
France Toray Films Europe S.A.S.	3.4	0	0	0	34	0	20	0	3	10	1.2	2,871	2,139	474	<ul style="list-style-type: none"> <li>• LUMI-RROR™ polyester film</li> </ul>

## Safety, Accident Prevention, and Environmental Preservation

# Third-Party Assurance

 **Lloyd's Register LRQA**

**Assurance Statement**  
related to Toray Industries, Inc.'s GHG Emissions Inventory  
for the fiscal year 2017

**Terms of Engagement**  
This assurance statement has been prepared for Toray Industries, Inc.

Lloyd's Register Quality Assurance Ltd. (LRQA) was commissioned by Toray Industries, Inc. (The Organisation) to assure its greenhouse gas (GHG) emissions data for the fiscal year 2017, that is, 1 April 2017 to 31 March 2018, ("the report"). The report relates to the direct GHG emissions and energy indirect GHG emissions from the activities of the Organisation and its consolidated subsidiaries in Japan and overseas.

**Management Responsibility**  
The Organisation's management was responsible for preparing the report and for maintaining effective internal controls over the data and information disclosed. LRQA's responsibility was to carry out an assurance engagement on the report in accordance with our contract with the Organisation.

Ultimately, the report has been approved by, and remains the responsibility of the Organisation.

**LRQA's Approach**  
Our verification has been conducted in accordance with ISO 14064-3:2006 Specification with guidance for validation and verification of greenhouse gas assertions to provide limited assurance that GHG emissions data as presented in the report have been prepared in conformance with the Organisation's in-house reporting procedures taking into consideration the requirements of Japan's Act on Promotion of Global Warming Countermeasures (Act No. 117).


To form our conclusions the assurance engagement was undertaken as a sampling exercise and covered the following activities:

- reviewed processes related to the control of GHG emissions data and records;
- interviewed relevant staff of the organization responsible for managing GHG emissions data and records;
- visited Nagoya Plant in Japan to establish whether the in-house procedures have been effectively implemented; and
- verified historical GHG emissions data and records at an aggregated level for the fiscal year 2017.


**Level of Assurance & Materiality**  
The opinion expressed in this Assurance Statement has been formed on the basis of a limited level of assurance and at a materiality of the professional judgment of the verifier.

**LRQA's Opinion**  
Based on LRQA's approach nothing has come to our attention that would cause us to believe that the total GHG emissions data disclosed in the report and as summarized in Table 1 below are not materially correct or the report has not been prepared in conformance with the Organisation's in-house reporting procedures and taking into consideration the requirements of the Japan's Act on Promotion of Global Warming Countermeasures (Act No.117).

Page 1 of 2

 **Lloyd's Register LRQA**

**LRQA's Recommendations**  
The Organisation should continue improving the quality assurance and control systems with internal self-verification particularly across its consolidated subsidiaries in Japan and overseas.

Signed  Dated: 12 July 2018

Takahiro Ito  
LRQA Lead Verifier  
On behalf of Lloyd's Register Quality Assurance Limited  
Japan Business Centre, Queen's Tower A, 10<sup>th</sup> Floor  
2-3-1 Minatomirai, Nishi-ku, Yokohama 220-6010, Japan

LRQA reference: YKA4005148

**Table 1. Summary of Toray's GHG Inventory for the fiscal year 2017**

Scope of GHG Emissions	Tonnes CO <sub>2</sub> e
Direct GHG Emissions (Scope 1)	1,858,780
Energy Indirect GHG Emissions (Scope 2, Market-based) <sup>1</sup>	420,261
Energy Indirect GHG Emissions (Scope 2, Location-based) <sup>1</sup>	426,731
Other indirect GHG emissions (Scope 3) <sup>2</sup>	768,006
Scope 1 and Scope 2 GHG emissions based on the Japan's Act on Promotion of Global Warming Countermeasures (Act No. 117) <sup>3</sup>	2,029,367

Notes:  
(1) Scope 2, Location-based and Scope 2, Market-based are as defined in the GHG Protocol Scope 2 Guidance, 2015.  
(2) Scope 3 covers emissions associated with Categories 2, 3, and 4 only.  
(3) All emission factors used in accordance with the national regulation.

This Assurance Statement is subject to the provisions of this legal section:  
This Assurance Statement is only valid when published with the Report to which it refers. It may only be reproduced in its entirety.

Lloyd's Register Group Limited, its affiliates and subsidiaries, including Lloyd's Register Quality Assurance Ltd. (LRQA) and their respective officers, employees or agents are, individually and collectively, referred to in this Legal Section as "Lloyd's Register". Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or for any other loss, damage or expense caused by reliance on the information or advice in this document if the person has agreed a contract with the relevant Lloyd's Register entity for the provision of the information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Due to inherent limitations in any internal control, it is possible that fraud, error, or non-compliance with laws and regulations may occur and not be detected. Further, the verification was not designed to detect all weaknesses or errors in internal controls so far as they relate to the requirements set out above as the verification has not been performed continuously throughout the period and the verification carried out on the relevant internal controls were on a test basis. Any projection of the evaluation of control to future periods is subject to the risk that the processes may become inadequate because of changes in conditions, or that the degree of compliance with them may deteriorate.

The English version of the Assurance Statement is the only valid version. Lloyd's Register assumes no responsibility for versions translated into other languages.

In the case of any conflict between the English and Japanese versions of this legal section, the English version shall prevail.

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## CSR Data

This section is designed to be useful to ESG assessment agencies and other stakeholders. It includes ESG data and tables that show where to find information in the report corresponding to the GRI Standards and ISO 26000 subjects.

In preparing this report, the Toray Group referenced the GRI Sustainability Reporting Standards 2016, which serve as international guidelines for sustainability reporting. This report was also prepared in accordance with the Responsible Care Code published by the Responsible Care Council of the Japan Chemical Industry Association.

In addition, the following guidelines were also used as references in preparing this report:

- Environmental Accounting Guidelines 2005 issued by the Japanese Ministry of the Environment
- ISO 26000: 2010 (Guidance on social responsibility)



## CSR Data

# Comparative Table with GRI Standards

### General Disclosures

Organizational profile		References
102-1	Name of the organization.	> <a href="#">Corporate Outline</a>
102-2	Activities, brands, products, and services	> <a href="#">Corporate Outline</a>
102-3	Location of headquarters	> <a href="#">Global Network</a>
102-4	Location of operations	> <a href="#">Global Network</a>
102-5	Ownership and legal form	> <a href="#">Corporate Outline</a> > <a href="#">Financial Results</a>
102-6	Markets served	> <a href="#">Corporate Outline</a> > <a href="#">Financial Results</a> >
102-7	Scale of the organization	> <a href="#">Corporate Outline</a> > <a href="#">Financial Results</a> >
102-8	Information on employees and other workers	> <a href="#">ESG Data</a>
102-9	Supply chain	> <a href="#">Briefing for individual investors</a> > <a href="#">Toray Group growth strategies</a>
102-10	Significant changes to the organization and its supply chain	N/A
102-11	Precautionary Principle or approach	> <a href="#">Risk Management</a>
102-12	External initiatives	> <a href="#">CSR Data</a>
102-13	Membership of associations	Toray belongs to the following associations: Nippon Keidanren (Japan Business Federation), Japan Chemical Industry Association, and Sustainable Apparel Coalition (SAC)
Strategy		References
102-14	Statement from senior decision-maker	> <a href="#">Message from the President</a>

Ethics and Integrity		References
102-16	Values, principles, standards, and norms of behavior	> <a href="#">Management Philosophy and CSR</a>
Governance		References
102-18	Governance structure	> <a href="#">Corporate Governance and Management Transparency</a>
Stakeholder Engagement		References
102-40	List of stakeholder groups	> <a href="#">Communication Policy and Framework Basic Policies to Promote Dialogue with Stakeholders</a>
102-41	Collective bargaining agreements	> <a href="#">Corporate Governance and Management Transparency Policy and Framework Dialogue with Labor Unions</a>
102-42	Identifying and selecting stakeholders	> <a href="#">Communication Policy and Framework Basic Basic Policies to Promote Dialogue with Stakeholders</a>
102-43	Approach to stakeholder engagement	> <a href="#">CSR Road Map and Progress on Key Performance Indicators in Fiscal 2017</a> > <a href="#">Communication</a>
102-44	Key topics and concerns raised	> <a href="#">Dialogue with Thought Leaders</a>
102-45	Entities included in the consolidated financial statements	> <a href="#">Corporate Outline</a> > <a href="#">Financial Results</a>
102-46	Defining report content and topic Boundaries	> <a href="#">Financial Results</a> > <a href="#">Materiality</a> > <a href="#">CSR Road Map and Progress on Key Performance Indicators in Fiscal 2017</a> > <a href="#">Editorial Policy</a>
102-47	List of material topics	> <a href="#">Materiality</a>
102-48	Restatements of information	N/A
102-49	Changes in reporting	N/A
102-50	Reporting period	> <a href="#">Editorial Policy</a>
102-51	Date of most recent report	August 31,2017
102-52	Reporting cycle	End of August yearly
102-53	Contact point for questions regarding the report	> <a href="#">Contact Us</a>

102-54	Claims of reporting in accordance with the GRI Standards	> <a href="#">GRI Standards Content Index</a>
102-55	GRI content index	> <a href="#">GRI Standards Content Index</a>
102-56	External assurance	> <a href="#">Third-Party Assurance</a>

## Management Approach

General Requirements for Reporting the Management Approach		References
103-1	Explanation of the material topic and its Boundary	> <a href="#">Toray Group Corporate Social Responsibility</a> > <a href="#">Materiality</a>
103-2	The management approach and its components	> <a href="#">CSR Road Map and Progress on Key Performance Indicators in Fiscal 2017</a>
103-3	Evaluation of the management approach	> <a href="#">CSR Road Map and Progress on Key Performance Indicators in Fiscal 2017</a>

## Economic

Economic Performance		References
201-2	Financial implications and other risks and opportunities due to climate change	> <a href="#">Contributing Solutions to Social Issues through Business Activities</a> > <a href="#">Toray Group Sustainability Vision</a>
201-4	Financial assistance received from government	Restrictions related to confidentiality and/or information difficult to obtain
Anti-corruption		References
205-1	Operations assessed for risks related to corruption	> <a href="#">Establishing a Corporate Culture of Total Respect for Corporate Ethics and Legal Compliance</a> <a href="#">Corporate Ethics and Legal Compliance Education</a>
205-2	Communication and training about anti-corruption policies and procedures	> <a href="#">Establishing a Corporate Culture of Total Respect for Corporate Ethics and Legal Compliance</a> <a href="#">Corporate Ethics and Legal Compliance Education – Distribution of Handbook/Education for Affiliates I and II</a>
205-3	Confirmed incidents of corruption and actions taken	None

Anti-competitive Behavior		References
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	N/A
<b>ENVIRONMENTAL</b>		
Materials		References
301-1	Materials used by weight or volume	<ul style="list-style-type: none"> <li>&gt; <a href="#">Toray Group Sustainability Vision</a></li> <li>&gt; <a href="#">Promoting Life Cycle Management</a></li> </ul>
301-2	Recycled input materials used	Information difficult to obtain
301-3	Reclaimed products and their packaging materials	<ul style="list-style-type: none"> <li>&gt; <a href="#">Initiatives to Reduce Waste</a></li> <li>&gt; <a href="#">Toray Group Distribution Initiatives Expanding Collection and Reuse of Packaging Materials</a></li> </ul>
Energy		References
302-1	Energy consumption within the organization	<ul style="list-style-type: none"> <li>&gt; <a href="#">Conserving Energy and Curbing Global Warming</a></li> <li>&gt; <a href="#">Environmental Impact Overview</a></li> </ul>
302-2	Energy consumption outside of the organization	<ul style="list-style-type: none"> <li>&gt; <a href="#">Third-Party Assurance</a></li> </ul>
302-3	Energy intensity	<ul style="list-style-type: none"> <li>&gt; <a href="#">Conserving Energy and Curbing Global Warming</a></li> <li>&gt; <a href="#">Environmental Impact Overview</a></li> </ul>
302-4	Reduction of energy consumption	<ul style="list-style-type: none"> <li>&gt; <a href="#">Conserving Energy and Curbing Global Warming</a></li> <li>&gt; <a href="#">Environmental Impact Overview</a></li> </ul>
302-5	Reductions in energy requirements of products and services	<ul style="list-style-type: none"> <li>&gt; <a href="#">Green Innovation Business Expansion Project</a></li> </ul>
Water		References
303-1	Water withdrawal by source	<ul style="list-style-type: none"> <li>&gt; <a href="#">Environmental Impact Overview</a></li> </ul>
303-2	Water sources significantly affected by withdrawal of water	N/A
303-3	Water recycled and reused	<ul style="list-style-type: none"> <li>&gt; <a href="#">Initiatives for Managing Water Resources</a></li> </ul>

Biodiversity		References
304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	> <a href="#">Biodiversity Initiatives</a>
304-2	Significant impacts of activities, products, and services on biodiversity	> <a href="#">Biodiversity Initiatives</a>
304-3	Habitats protected or restored	> <a href="#">Biodiversity Initiatives</a>
304-4	IUCN Red List species and national conservation list species with habitats in areas affected by operations	Information difficult to obtain
Emissions		References
305-1	Direct (Scope 1) GHG emissions	> <a href="#">Conserving Energy and Curbing Global Warming</a> > <a href="#">Environmental Impact Overview</a>
305-2	Energy indirect (Scope 2) GHG emissions	> <a href="#">Conserving Energy and Curbing Global Warming</a> > <a href="#">Environmental Impact Overview</a>
305-3	Other indirect (Scope 3) GHG emissions	> <a href="#">Conserving Energy and Curbing Global Warming</a> > <a href="#">Environmental Impact Overview</a>
305-4	GHG emissions intensity	> <a href="#">Conserving Energy and Curbing Global Warming</a> > <a href="#">Environmental Impact Overview</a>
305-5	Reduction of GHG emissions	> <a href="#">Conserving Energy and Curbing Global Warming</a> > <a href="#">Environmental Impact Overview</a>
305-6	Emissions of ozone-depleting substances (ODS)	> <a href="#">Conserving Energy and Curbing Global Warming</a> > <a href="#">Initiatives to Protect the Ozone Layer</a>
305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	> <a href="#">Initiatives to Prevent Air and Water Pollution</a> > <a href="#">Water Quality Management</a> > <a href="#">Environmental Impact Overview</a>



Effluents and Waste		References
306-1	Water discharge by quality and destination	<ul style="list-style-type: none"> <li>&gt; <a href="#">Initiatives to Prevent Air and Water Pollution</a></li> <li><a href="#">Water Quality Management</a></li> <li>&gt; <a href="#">Environmental Impact Overview</a></li> </ul>
306-2	Waste by type and disposal method	<ul style="list-style-type: none"> <li>&gt; <a href="#">Initiatives to Reduce Waste</a></li> <li>&gt; <a href="#">Environmental Impact Overview</a></li> </ul>
306-3	Significant spills	> <a href="#">Environmental Risk Management</a>
306-4	Transport of hazardous waste	N/A
306-5	Water bodies affected by water discharges and / or runoff	N/A
Environmental Compliance		References
307-1	Non-compliance with environmental laws and regulations	> <a href="#">Environmental Risk Management</a>
Supplier Environmental Assessment		References
308-1	New suppliers that were screened using environmental criteria	> <a href="#">Facilitating CSR Initiatives Throughout the Supply Chain</a>
308-2	Negative environmental impacts in the supply chain and actions taken New suppliers that were screened using environmental criteria	> <a href="#">Facilitating CSR Initiatives Throughout the Supply Chain</a>
Social		
Employment		References
401-1	New employee hires and employee turnover	Securing and Developing Human Resources to Create New Value
		<ul style="list-style-type: none"> <li>&gt; <a href="#">Creating a Positive Workplace for Employees</a></li> <li>&gt; <a href="#">Helping Employees Maintain Work-Life Balance</a></li> </ul>
401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	<ul style="list-style-type: none"> <li>&gt; <a href="#">Creating a Positive Workplace for Employees</a></li> <li>&gt; <a href="#">Helping Employees Maintain Work-Life Balance</a></li> </ul>
401-3	Parental leave	<ul style="list-style-type: none"> <li>&gt; <a href="#">Creating a Positive Workplace for Employees</a></li> <li><a href="#">Helping Employees Maintain Work-Life Balance</a></li> </ul>

Occupational Health and Safety		References
403-1	Workers representation in formal joint management–worker health and safety committees	Undisclosed
403-2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	> <a href="#">Occupational Safety and Accident Prevention Activities</a>
403-3	Workers with high incidence or high risk of diseases related to their occupation	N/A
403-4	Health and safety topics covered in formal agreements with trade unions	> <a href="#">Occupational Safety and Accident Prevention Activities</a> <a href="#">Policy and Framework</a> <a href="#">Action Policy and Main Activities</a>
Training and Education		References
404-1	Average hours of training per year per employee	> <a href="#">Securing and Developing Human Resources to Create New Value</a>
404-2	Programs for upgrading employee skills and transition assistance programs	> <a href="#">Securing and Developing Human Resources to Create New Value</a>
404-3	Percentage of employees receiving regular performance and career development reviews	> <a href="#">Securing and Developing Human Resources to Create New Value</a>
Diversity and Equal Opportunity		References
405-1	Diversity of governance bodies and employees	> <a href="#">Promoting Diversity</a>
405-2	Ratio of basic salary and remuneration of women to men	> <a href="#">Creating a Positive Workplace for Employees</a> <a href="#">Helping Employees Maintain Work-Life Balance</a>
Non-discrimination		References
406-1	Incidents of discrimination and corrective actions taken	> <a href="#">Establishing a Corporate Culture of Total Respect for Corporate Ethics and Legal Compliance</a>
Child Labor		References
408-1	Operations and suppliers at significant risk for incidents of child labor	> <a href="#">Human Rights Promotion and Human Resources Development</a> <a href="#">Policy and Framework</a>

Forced or Compulsory Labor		References
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	> <a href="#">Human Rights Promotion and Human Resources Development Policy and Framework</a>
Human Rights Assessment		References
412-2	Employee training on human rights policies or procedures	> <a href="#">Committed to Human Rights</a>
412-3	Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	> <a href="#">Toray Group's Socially Responsible Procurement, Purchasing and Distribution</a>
Supplier Social Assessment		References
414-1	New suppliers that were screened using social criteria	> <a href="#">Toray Group's Socially Responsible Procurement, Purchasing and Distribution</a>
414-2	Negative social impacts in the supply chain and actions taken	> <a href="#">Toray Group's Socially Responsible Procurement, Purchasing and Distribution</a>
Customer Health and Safety		References
416-1	Assessment of the health and safety impacts of product and service categories	> <a href="#">Initiatives for Product Safety and Quality Assurance</a>
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	N/A
Marketing and Labeling		References
417-1	Requirements for product and service information and labeling	> <a href="#">Initiatives for Product Safety and Quality Assurance</a>
417-2	Incidents of non-compliance concerning product and service information and labeling	> <a href="#">Initiatives for Product Safety and Quality Assurance</a> Notification and apology based on Consumer Affairs Agency administrative order related to Torayvino® PT302F Megamori Pack household pot-type water purifier
417-3	Incidents of non-compliance concerning marketing communications	Notification and apology based on Consumer Affairs Agency administrative order related to Torayvino® PT302F Megamori Pack household pot-type water purifier
Socioeconomic Compliance		References
419-1	Non-compliance with laws and regulations in the social and economic area	Violations Reported in Fiscal 2017 Notification and apology based on Consumer Affairs Agency administrative order related to Torayvino® PT302F Megamori Pack household pot-type water purifier

CSR Data

# Comparative Table with ISO 26000 Subjects

## Core subjects

- ▼ Organizational governance
- ▼ Fair operating practices
- ▼ Human rights
- ▼ Consumer issues
- ▼ Labor practices
- ▼ Community involvement and development
- ▼ The environment

### Organizational governance

Issues	Toray's initiatives
1. Organizational governance	Management Philosophy and CSR
	Message from the President
	Management Strategies and CSR
	Toray Group's Corporate Social Responsibility
	Materiality
	CSR Road Map and Progress on Key Performance Indicators in Fiscal 2017
	Corporate Governance and Management Transparency : Policy and Framework
	Implementing CSR Activities and Improving CSR Education
	Corporate Ethics and Legal Compliance : Policy and Framework
	Promoting Diversity
	Communication : Policy and Framework

## Human rights

Issues	Toray's initiatives
1. Due diligence	
2. Human rights risk situations	Committed to Human Rights
	Toray Group's Socially Responsible Procurement, Purchasing and Distribution
3. Avoidance of complicity	Committed to Human Rights
	Toray Group's Socially Responsible Procurement, Purchasing and Distribution
4. Resolving grievances	Establishing a Corporate Culture of Total Respect for Corporate Ethics and Legal Compliance
5. Discrimination and vulnerable groups	Committed to Human Rights
	Promoting Diversity
6. Civil and political rights	Corporate Ethics and Legal Compliance : Policy and Framework
7. Economic, social and cultural rights	Committed to Human Rights
	Social Contribution Activities : Policy and Framework
8. Fundamental principles and rights at work	Committed to Human Rights

## Labor practices

Issues	Toray's initiatives
1. Employment and employment relationship	Committed to Human Rights
	Securing and Developing Human Resources to Create New Value
	Promoting Diversity
2. Conditions of work and social protection	Creating a Positive Workplace for Employees
3. Social dialogue	Corporate Governance and Management Transparency
	Communication with Employees
4. Health and safety at work	Occupational Safety and Accident Prevention Activities
5. Human development and training in the workplace	Securing and Developing Human Resources to Create New Value

## The environment

Issues	Toray's initiatives
1. Prevention of pollution	Safety, Accident Prevention and Environmental Preservation : Policy and Framework (Safety, Health, Accident Prevention and Environmental Preservation Management)
	Voluntary Initiatives to Reduce Atmospheric Emissions of Chemical Substances
	Initiatives to Prevent Air and Water Pollution
	Initiatives to Reduce Waste
	Environmental Risk Management
	Environmental Impact Overview
2. Sustainable resource use	Approach to Green Innovation Products
	Promoting Recycling Initiatives
	Toray Group Distribution Initiatives
	Conserving Energy and Curbing Global Warming
	Initiatives for Managing Water Resources
	Initiatives to Reduce Waste
	Environmental Impact Overview
3. Climate change mitigation and adaptation	Contributing Solutions to Social Issues through Business Activities
	Green Innovation Business Expansion Project
	Toray Group Distribution Initiatives
	Conserving Energy and Curbing Global Warming
	Environmental Impact Overview
4. Protection of the environment, biodiversity and restoration of natural habitats	Biodiversity Initiatives
	Environmental Risk Management

## Fair operating practices

Issues	Toray's initiatives
1. Anti-corruption	Corporate Ethics and Legal Compliance : Policy and Framework
	Violations Reported in Fiscal 2017
	Establishing a Corporate Culture of Total Respect for Corporate Ethics and Legal Compliance
	Compliance with Antitrust Laws and Global Anti-Bribery Regulations
2. Responsible political involvement	Establishing a Corporate Culture of Total Respect for Corporate Ethics and Legal Compliance
3. Fair competition	Establishing a Corporate Culture of Total Respect for Corporate Ethics and Legal Compliance
	Compliance with Antitrust Laws and Global Anti-Bribery Regulations
4. Promoting social responsibility in the value chain	Toray Group's Socially Responsible Procurement, Purchasing and Distribution
	Toray Group Distribution Initiatives
	Occupational Safety and Accident Prevention Activities
	Communication with Stockholders and Investors
5. Respect for property rights	Communication with Stockholders and Investors



## Consumer issues

Issues	Toray's initiatives
1. Fair marketing, factual and unbiased information and fair contractual practices	Communication with Customers
	Communication with the Media
2. Protecting consumers' health and safety	Initiatives for Product Safety and Quality Assurance
3. Sustainable consumption	Contributing Solutions to Social Issues through Business Activities
	Green Innovation Business Expansion Project
	Promoting Life Cycle Management
	Approach to Green Innovation Products
	Promoting Recycling Initiatives
4. Consumer service, support, and complaint and dispute resolution	Initiatives for Product Safety and Quality Assurance
5. Consumer data protection and privacy	Protection of Personal Information
6. Access to essential services	Business Continuity Plan Initiatives
7. Education and awareness	Initiatives for Product Safety and Quality Assurance

## Community involvement and development

Issues	Toray's initiatives
1. Community involvement	Communication with Local Communities
	Social Contribution Activities : Policy and Framework
2. Education and culture	Social Contribution Activities (Science and Technology Promotion)
	Social Contribution Activities (Environment and Communities)
3. Employment creation and skills development	Social Contribution Activities (Environment and Communities)
4. Technology development and access	Social Contribution Activities (Science and Technology Promotion)
5. Wealth and income creation	
6. Health	Social Contribution Activities (Health and Welfare)
7. Social investment	Social Contribution Activities (Fiscal 2017 Results)

CSR Data

ESG Data

Environment-Related

		Scope	Period	2015	2016	2017	Unit
Environment conservation costs	Investment	Toray	FY	2.69	2.68	2.02	billion Yen
	Cost			6.55	6.71	6.81	
Economic impact of environmental initiatives		Toray	FY	1.27	1.21	0.53	billion Yen
Energy consumption		Toray	FY	29.0	27.9	29.0	million gigajoules
		Group companies in Japan	FY	7.2	7.2	6.5	
		Group companies outside Japan	FY	46.8	52	50.8	
Unit energy consumption index (% compared to fiscal 1990)		Toray	FY	86.2	82.7	81.6	—
Water		Toray	FY	171	168	174	million tons
		Group companies in Japan	FY	12	13	13	
		Group companies outside Japan	FY	38	44	41	
Industrial wastewater		Toray	FY	167	159	164	million tons
		Group companies in Japan	FY	10	10	10	
		Group companies outside Japan	FY	24	25	24	
Greenhouse gas emissions		Toray	FY	2,120	2,010	2,030	1,000 tons CO <sub>2</sub> eq
		Group companies in Japan	FY	460	450	400	
		Group companies outside Japan	FY	2,920	3,150	3,040	
Atmospheric emissions (NOx)		Toray	FY	1,456	1,332	1,335	

	Group companies in Japan	FY	34	51	40	tons
	Group companies outside Japan	FY	828	768	716	
Atmospheric emissions (SOx)	Toray	FY	298	264	268	tons
	Group companies in Japan	FY	24	20	16	
	Group companies outside Japan	FY	2,870	3,090	2,192	
Emissions of substances subject to the PRTR Act	Toray	FY	208	189	330	tons
	Group companies in Japan	FY	265	245	101	
	Group companies outside Japan	FY	196	318	442	
VOC atmospheric emissions	Toray	FY	323	253	418	tons
	Group companies in Japan	FY	380	345	185	
	Group companies outside Japan	FY	310	396	505	
Atmospheric emissions (Dust)	Toray	FY	108	105	103	tons
	Group companies in Japan	FY	3	3	1	
	Group companies outside Japan	FY	220	235	122	
Coal ash (recycled)	Toray	FY	63.9	62.4	57.8	1,000 tons
	Group companies in Japan	FY	—	—	—	
	Group companies outside Japan	FY	26.7	17.2	19.1	
Waste (direct landfill disposal)	Toray	FY	0.2	0.0	0.0	1,000 tons
	Group companies in Japan	FY	0.5	0.2	0.6	
	Group companies outside Japan	FY	19.5	24.4	24.1	
Water emissions (BOD)	Toray	FY	713	655	576	tons
	Group companies in Japan	FY	25	27	24	
	Group companies outside Japan	FY	236	245	177	tons

Water emissions (COD)	Toray	FY	812	776	789	tons
	Group companies in Japan	FY	42	24	27	tons
	Group companies outside Japan	FY	1,621	1,603	1,298	
Wastewater: Total nitrogen emissions	Toray	FY	437	406	415	tons
	Group companies in Japan	FY	18	14	14	
	Group companies outside Japan	FY	—	—	—	
Wastewater: Total phosphorous emissions	Toray	FY	28	27	25	tons
	Group companies in Japan	FY	1	1	1	
	Group companies outside Japan	FY	—	—	—	

## Society-Related

		Scope	Period	2015	2016	2017	Unit
Number of employees (As of March 31, 2018)	Total	Toray	As of the end of each fiscal year	7,223	7,220	7,625	persons
	Male			6,452	6,440	6,785	
	Female			771	780	840	
Percentage of women in unit manager or higher positions		Toray	As of April each year	8.7	8.9	9.0	%
Women in management positions (%)	Management staff (Section manager or higher positions)			4.4	4.5	4.6	
Employment rate of persons with disabilities		Toray	Year	2.12	2.10	2.20	%
Average time on the job	Total	Toray	FY	14.1	14.5	14.6	years
	Male			13.9	14.2	14.5	
	Female			15.8	16.1	15.8	
Percentage of available annual paid leave used by employees	Toray employees (non-managerial)	Toray	FY	92.9	89.8	88.4	%

Number of employees taking childcare leave	Total	Toray	FY	56	68	71	persons
	Male			3	4	3	
	Female			53	64	68	
Number of employees taking family care leave		Toray	FY	5	3	1	persons
Number of employees hired	Total	Toray	FY	357	314	337	persons
	Male			315	270	283	
	Female			42	44	54	
Occupational accident frequency rate (Toray Group)		Toray Group (all accidents)	Year	0.23	0.60	0.60	—
		Toray Group (accidents causing lost work time)	Year	0.14	0.33	0.39	—

## Governance-Related

	Scope	Period	2015	2016	2017	Unit
Number of members of the Board	Toray	FY	23	23	19	persons
Number of outside directors (independent officers)	Toray	FY	2	2	2	persons
Number of female directors	Toray	FY	0	0	0	persons
Ratio of female members of the Board	Toray	FY	0	0	0	%
R&D expenses	Toray Group	FY	58.8	59.2	66.2	billion yen
Ratio of R&D expenses to net sales	Toray Group	FY	2.8	2.9	3.0	%
Number of major violations of laws or ordinances	Toray group	FY	0	1	1	violation

## Editorial Policy

The Toray Group publishes an annual corporate social responsibility (CSR) report in order to communicate its CSR initiatives to stakeholders.

The report covers the Group's social responsibility, corporate vision and strategies, and includes special features and activity reports based on the issues set out in the Group's CSR Guidelines.

This year's report includes three special features. The first, a message from the CTO, looks at what drives the Toray R&D focus on finding solutions to social issues. The second explores Toray solutions for environmental issues and its medical solutions for improving quality of life and health, outlining the contributions made by the Toray's advanced materials. The third feature focuses on science and technology promotion, one of the priority areas for Toray's social contribution activities.

### Period Covered by this Report

This report covers fiscal 2017, the period from April 1, 2017 to March 31, 2018. Some content may be current up to August 2018.

### Report Boundary

## Environmental Data

Covers Toray Industries, Inc. and the following 77 manufacturing subsidiaries (78 companies in all). Occupational safety data also encompasses non-manufacturing companies and covers Toray and 52 group companies in Japan, together with 76 group companies outside of Japan (129 companies in all).

Notes:

1. Environmental data used in this report concerning greenhouse gas emissions by Toray Industries, Inc. has been verified by a third party, Lloyds Register Quality Assurance Limited. Verified data is indicated with a • mark.
2. For group companies and plants newly covered under the scope of environmental data, results are compiled and published using performance data for the fiscal year in which data was first collected as part of the Toray Group. Under Toray's Fifth Medium-Term Environmental Plan, if a target is managed based on an absolute value (such as air emissions of a chemical substance), the target is managed by adding to a baseline value the performance data for the fiscal year in which data was first collected.

## **Group companies in Japan: 25**

Toray Opelontex Co., Ltd., Ogaki Fuso Spinning Co., Ltd., Toray Textiles, Inc., Toray Coatex Co., Ltd., Toray Amtecs Inc., Toray Monofilament Co., Ltd., Toray Hybrid Cord, Inc., Maruichi Fiber Co., Ltd., So-Wa Textile Co., Ltd., Du Pont-Toray Co., Ltd., Toyo Plastic Seiko Co., Ltd., Toray PEF Products Inc., Toray Advanced Film Co., Ltd., Toray KP Films Inc., Dow Corning Toray Co., Ltd., Toray Fine Chemicals Co., Ltd., Soda Aromatic Co., Ltd., Toray ACE Co., Ltd., Toray Engineering Co., Ltd., Toray Precision Co., Ltd., Suido Kiko Kaisha, Ltd., Toray Medical Co., Ltd., Toray Research Center, Inc., Toyo Jitsugyo Co., Ltd., Toray Carbon Magic Co., Ltd.

## **Group companies outside Japan: 52**

### **North America**

Toray Fluorofibers (America), Inc., Toray Plastics (America), Inc., Toray Resin Co., Toray Membrane USA, Inc., Toray Composite Materials America, Inc., Zoltek Companies, inc., Zoltek de Mexico, S.A. de C.V., Toray Resin Mexico, S.A. de C.V.

### **Europe**

Toray Textiles Europe Ltd., Euro Advanced Carbon Fiber Composites GmbH, Toray Films Europe S.A.S., Toray Carbon Fibers Europe S.A., Alcantara S.p.A., Toray Textiles Central Europe s.r.o, Zoltek Zrt, Greenerity GmbH

### **Asia**

P.T. Acryl Textile Mills, P.T. Century Textile Industry Tbk, P.T. Easterntex, P.T. Indonesia Synthetic Textile Mills, P.T. Indonesia Toray Synthetics, P.T. Toray Polytech Jakarta, Luckytex (Thailand) Public Company Limited, Thai Toray Textile Mills Public Company Limited, Thai Toray Synthetics Co., Ltd., Penfabric Sdn. Berhad, Penfibre Sdn. Berhad, Toray Plastics (Malaysia) Sdn. Berhad, Toray BASF PBT Resin Sdn. Berhad, Toray Fibers (Nantong) Co., Ltd., Toray Polytech (Nantong) Co., Ltd., Toray Sakai Weaving & Dyeing (Nantong) Co., Ltd., Toray Jifa (Qingdao) Textile Co., Ltd., Toray Plastics (Suzhou) Co., Ltd., Toray BlueStar Membrane Co., Ltd., Toray Fibers & Textiles Research Laboratories (China) Co., Ltd., Toray Advanced Materials Research Laboratories (China) Co., Ltd., Toray Plastics (Shenzhen) Ltd., Toray Plastics Precision (Zhongshan) Ltd., Toray Film Products (Zhongshan) Ltd., Toray Medical (Qingdao) Co., Ltd., Toray Advanced Film Kaohsiung Co., Ltd., Toray Plastics (Chengdu) Co., Ltd., Toray Advanced Materials Korea Inc., Toray Chemical Korea Inc., STEMCO, Ltd., Toray WBD Membrane Technology (JS) Co., Ltd., Cangzhou Toray Fine Chemicals Co., Ltd., Toray Kusumgar Advanced Textile Private Limited, Toray Membrane Middle East LLC, Toray Battery Separator Film Korea Limited



## Social Data

Covers Toray Industries, Inc. and its consolidated subsidiaries (61 companies in Japan, 101 companies outside of Japan), but scope of reporting may differ for some items.

## Economic Data

Covers Toray Industries, Inc. and its 257 consolidated companies (258 companies in all).

## Disclaimer:

This report contains forward-looking statements in addition to historical and current facts. These forward-looking statements are assertions or assumptions that were prepared on the basis of available information at the time of publication. Actual future social conditions and results of business activities may differ from any forecasts contained in this report, as a result of changing circumstances.

## Reference Guidelines

- GRI Standards

Note: The comparative table referencing the GRI Standards is available at the Toray website.

- Responsible Care Code issued by the Responsible Care Council of the Japan Chemical Industry Association
- Environmental Accounting Guidelines 2005 issued by the Ministry of the Environment, Japan
- ISO 26000:2010 (Guidance on social responsibility)

Note: The comparative table referencing ISO 26000:2010 is available at the Toray website.

## External Evaluation

### Evaluations from the Perspective of Socially Responsible Investment

Toray was included in the following SRI indices as of March 31, 2018.

### Dow Jones Sustainability Index Asia Pacific

Toray is included in the Asia Pacific Index of the Dow Jones Sustainability Indices (DJSI), an SRI index administered by U.S.-based Dow Jones and Switzerland-based RobecoSAM.



### MSCI ESG Indexes

Toray is included in the MSCI ESG Indexes. MSCI provides institutional investors (from pension funds to hedge funds) across the globe with various tools to support investment decisions.



Note: The inclusion of Toray in any MSCI Index, and the use of MSCI logos, trademarks, service marks or index names on this page is not an indication that MSCI or its affiliates endorse, warrant or promote Toray. MSCI, MSCI Index names, and logos are trademarks or service marks and are the exclusive property of MSCI or its affiliates.

## Ethibel Pioneer & Excellence

Toray is included in the Ethibel Pioneer and Ethibel Excellence investment registers of Forum Ethibel, a Belgian non-profit organization that promotes socially responsible investment.



## Morningstar Socially Responsible Investment Index (MS-SRI)

Toray is included in the Morningstar Socially Responsible Investment (MS-SRI) Index. Morningstar Japan K.K. selects 150 listed companies in Japan that have been assessed for outstanding social responsibility, indexing the prices of their shares. MS-SRI is the first SRI index in Japan.



## Sompo Japan Nipponkoa Asset Management (SNAM) Sustainability Index

Toray is included in the SNAM Sustainability Index managed by Sompo Japan Nipponkoa Asset Management (SNAM). The SNAM Sustainability Index is an SRI index fund for pension funds and institutional investors that broadly invest in corporations that rate highly for environmental, social and governance (ESG).



## External Evaluation of Information Disclosure to Investors

In the "Investor Relations" section of its corporate website, Toray provides information about its financial results and management policies and strategies for stockholders and investors. In an effort to disclose information fairly, Toray promptly posts financial data and presentation materials, including English translations, used in its briefings for institutional investors. In fiscal 2017, Toray's publications were evaluated externally by a number of organizations, as shown below.

<b>Organization details</b>	<b>Evaluations</b>
Daiwa Investor Relations Co., Ltd.	Awards for outstanding websites in 2017
Nikko Investor Relations Co., Ltd.	Most outstanding site in overall completeness, in a ranking of listed company websites in 2017