

'TORAY'
Innovation by Chemistry



TORAY REPORT



Toray Integrated
Annual Report **2019**
April 1, 2018–March 31, 2019

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

Corporate Missions —————

- For our customers** To provide new value to our customers through high-quality products and superior services
- For our employees** To provide our employees with opportunities for self development in a challenging environment
- For our stockholders** To provide our stockholders with dependable and trustworthy management
- For society** To establish ties and develop mutual trust as a responsible corporate citizen

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Title (TORAY REPORT, MESSAGE): **Tetsukuro Matsunaga**, "NAGAUTA-SHAMISEN" Artist, Important intangible cultural property "NAGAUTA" holder



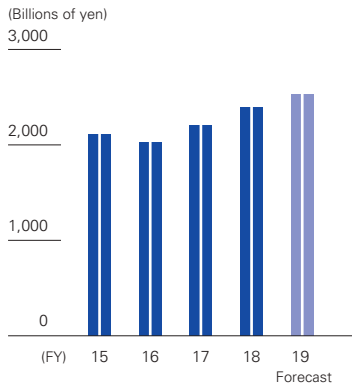
Innovation by Chemistry

Materials can Change Our Lives

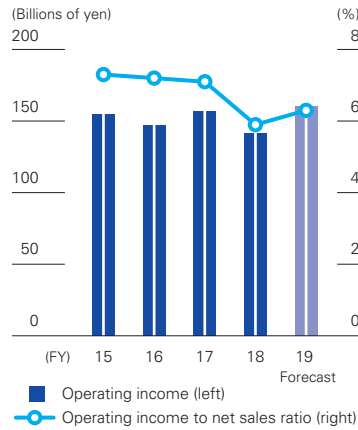
Toray Group firmly believes that “materials, as the foundation of all products, have the power to bring about fundamental transformations in society.” Based on this belief, our goal is to become a global top company in advanced materials as an integrated chemical industry group. Since our establishment, we have positioned “contributing to society” as the focus of our existence. Carrying this focus into our corporate philosophy of “contributing to society through the creation of new value with innovative ideas, technologies, and products,” we are ramping up efforts to solve a host of issues worldwide together with global partners by providing innovative technologies and advanced materials. With this in mind, we are working to become a corporate group that provides high value to all stakeholders.

Financial & Non-financial Highlights

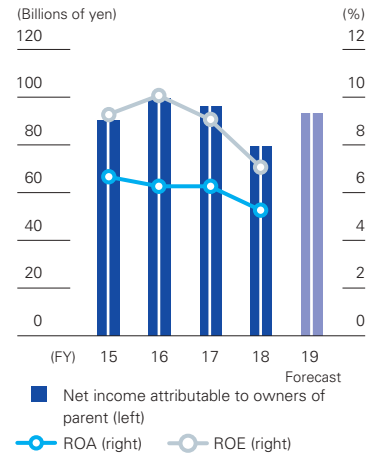
Net Sales



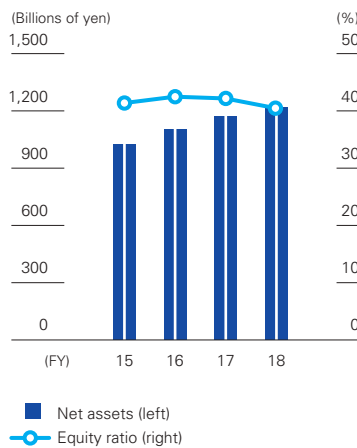
Operating Income and Operating Income to Net Sales Ratio



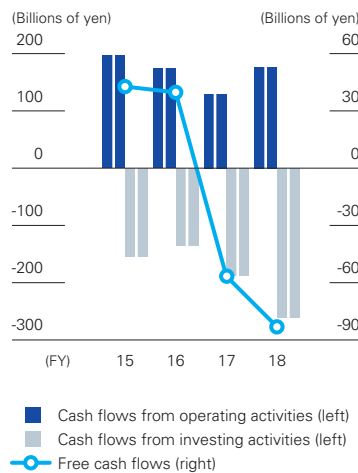
ROA, ROE and Net Income Attributable to Owners of Parent



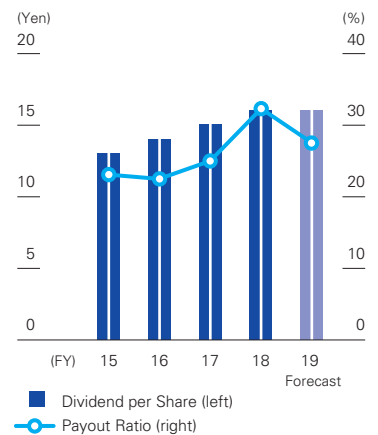
Net Assets and Equity Ratio



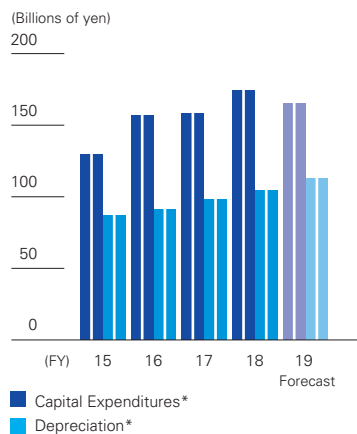
Cash Flows



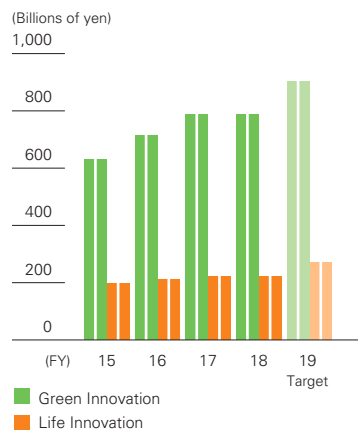
Dividend per Share and Payout Ratio



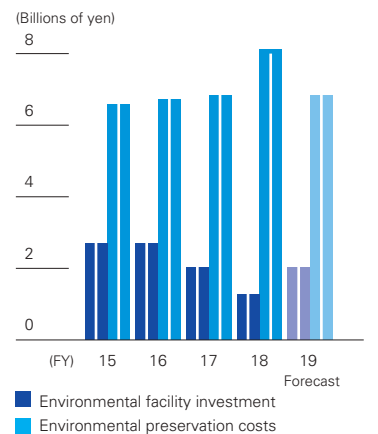
Capital Expenditures and Depreciation



Net Sales of Green Innovation and Life Innovation Businesses

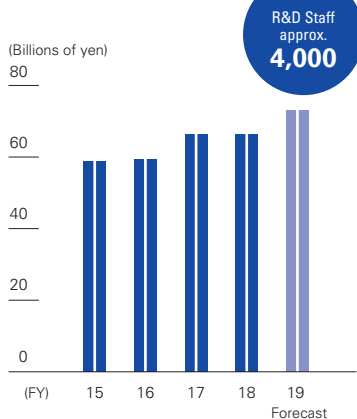


Environmental Facility Investment and Environmental Preservation Costs

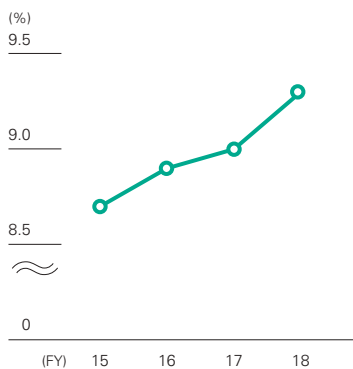


* Total of tangible assets and intangible assets (excluding goodwill) from FY 2016
Tangible assets for FY2015

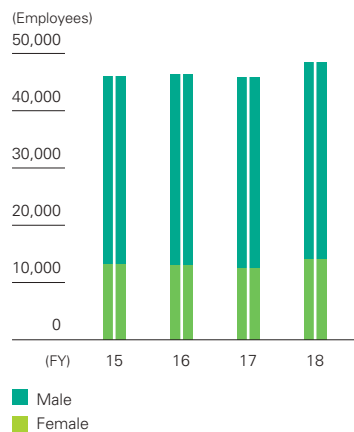
R&D Expenses



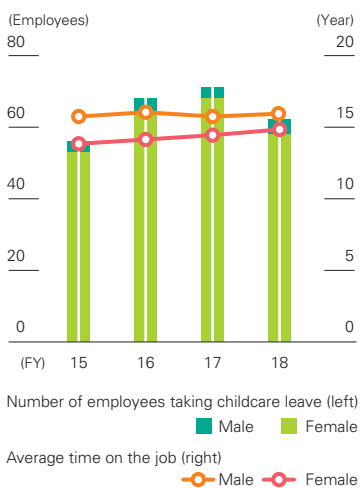
Percentage of Women in Unit Manager or Higher Positions (Toray)



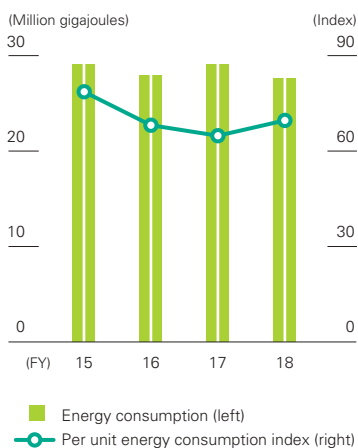
Number of Employees by Gender



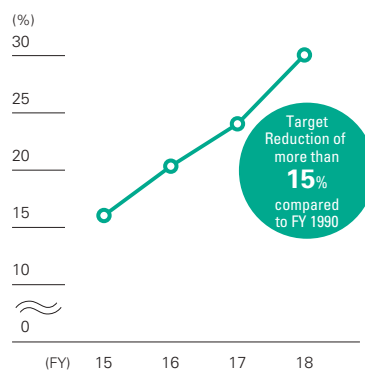
Average Time on the Job and Number of Employees Taking Childcare Leave



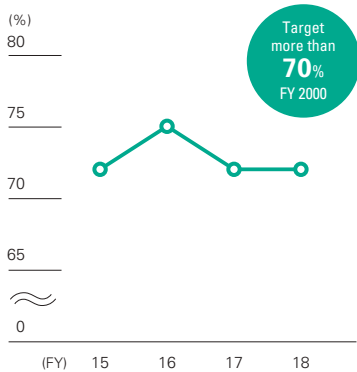
Energy Consumption and per Unit Energy Consumption Index (Base year FY 1990)



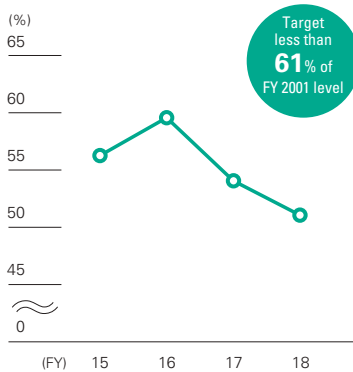
Reduction of Greenhouse Gas Emissions (Toray Group companies in Japan)



Reduction of Atmospheric VOC Emissions



Comparative Water Usage per Unit of Sales (FY 2001, set to an index value of 100)



Waste Recycling Rate



MMSO

To Our Stockholders and Investors



Maintaining a Sustainable Growth Trend

Surpassing the record high of the previous fiscal year, Toray's consolidated net sales increased 8.3% year on year, to ¥2,388.8 billion in fiscal 2018, the fiscal year ended March 31, 2019. From a profit perspective, however, operating income declined 9.6% compared with the previous fiscal year, to ¥141.5 billion. This was largely due to rise in raw material and fuel prices and the impact of such factors as the economic slowdown in China in the latter half of fiscal 2018. Looking ahead, the Company is projecting a return to both net sales and operating income growth in fiscal 2019.

Currently, Toray Group is in the third stage of its long-term corporate vision, "AP-Growth TORAY 2020." In specific terms, we are working on "business expansion in growth business fields," "expansion and advancement of global business," and "strengthening competitiveness," as growth strategies under our medium-term management program, "Project AP-G 2019." As far as efforts for "expansion and advancement of global business" are concerned, we are pushing forward the Green Innovation Business Expansion (GR) Project in a bid to help resolve global environmental as well as resource and energy issues, and the Life Innovation Business Expansion (LI) Project in an effort to enhance the quality of medical care, ease the burden of medical professionals, and contribute



Making the Most of Its Unique Attributes, Toray is Committed to Becoming a Truly Excellent Company

Akihiro Nikkaku
President

to the realization of a society where people live long and healthy lives. Complementing these Group-wide initiatives, we are also focusing on the creation of new businesses that will serve as the source of earnings in the new growth phase from 2020.

Why Target Net Sales of ¥3 Trillion?

When formulating our current long-term corporate vision in 2011, our goal was to achieve consolidated net sales of ¥3 trillion around 2020. We are taking definitive steps toward achieving this goal. We believe that net sales of ¥3 trillion as a materials manufacturer equates to the ¥10 to ¥15 trillion of end-consumer assembly companies in the automobile and home appliance industries. This level of net sales is also essential for Toray Group to announce its presence as a global excellent company in its chosen field. The fundamental value of an end product will not change without an innovative change in its material. In other words, the use of innovative materials can help significantly increase the worth of an end product. With a strong sense of mission, and the firm belief that “materials have the power to bring about fundamental transformations in society,” we are confident in our ability to achieve net sales of ¥3 trillion by continuously developing and commercializing innovative technologies and advanced materials ahead of the global competition.

Steady Increase in Long-term Corporate Value

In 2018, we formulated the “Toray Group Sustainability Vision,” which incorporates The World as Envisioned by Toray Group in 2050. Under this vision, we are looking to implement four broad initiatives: (1) accelerate measures to counter climate change, (2) realize sustainable, recycling-based use of resources and production, (3) provide clean water and air, and (4) contribute to better medical care and hygiene for people worldwide.

With the global population expected to increase to 10 billion by 2050, there are mounting environmental challenges such as the aging demographics in developed countries, climate change, water scarcity, and resource depletion, facing the planet earth. Recognizing that sustainability is a common issue of the utmost global importance in the 21st century, contributions by the corporate sector to help solve these problems through initiatives such as the sustainable development goals (SDGs) adopted by the United Nations, are attracting widespread interest. Against this backdrop, Toray Group has positioned “contributing to society” as the focus of its existence since its establishment and identified “contributing to society through the creation of new value with innovative ideas, technologies, and products” as its corporate philosophy. Consistently dealing with global issues, we are confident that our efforts in conjunction with global partners are enhancing the Group’s long-term corporate value with each passing year.

MESSE

Adopting a Long-term Perspective and Engaging in Management That Sets Up Programs to Address Issues

Today, discontinuous change at an extraordinary pace is considered a common occurrence. In reality, gaps are emerging between expectations regarding the pace of demand growth and long-term investments in research and technological development. There are instances where projected sales and earnings can no longer be anticipated. Because of our technology reserves built up over the past decade or two, we are confident that innovative materials can indeed be developed. In addition, materials possess unlimited potential. When in tune with the requirements of the era, we have on numerous occasions witnessed the birth of major new markets. Initially developed for a different purpose, high-performance films, for example, have been used for reflectors and in the polarizer production process as a result of the emergence of LCD televisions, as well as in touch panels following the increasing use of smartphones and tablets. The development of materials is both interesting and problematic, with a huge difference from the end product assembly industry when it comes to the diversity in application development.

Naturally, securing anticipated sales and earnings through targeted applications is basic to any management approach. Engaging in continuous investment and development based on an optimistic forecast is never a recipe for success. Given the limited nature of management resources, it is only natural and prudent that a company withdraw from a business that is detrimental to its corporate value. For a materials company, however, a business that is currently underperforming may still offer potential sometime in the future. While the pace at which earnings can be generated is a key factor, a more important point in determining the potential of a business is the existence or otherwise of long-term social value. For this reason, it is vital to maintain a long-term vision. Our management approach is therefore to identify short-, medium-, and long-term issues based on a long-term vision. My philosophy is to stay focused on the basics, visualize how the Company should be, and do whatever has to be done.

As for staying focused on the basics, we refer to efforts

aimed at leveraging our core technologies while focusing on growth markets where issues need to be addressed. The important point here is to identify and target business domains that offer considerable potential. To this end, we recognize the critical need to conduct thoroughgoing analyses of the competition and other key factors. Based on these analyses, we acknowledge the importance of putting in place a meticulous implementation plan that unifies the production, sales and marketing as well as R&D functions to steadily push the plan forward in conjunction with related parties. As a materials manufacturer, it is vital that we paint a picture of the future that includes Win-Win relationships with robust partners. Under its Group-wide management strategies, Toray Group crystallizes its 10-year, broad outlook into a long-term vision. At the same time, the medium-term management program is formulated, which identifies management issues that need to be resolved. For the next three years during the mid-term, efforts are made to solve the issues. Rather than putting in place a "plan" that is grounded in a set of numerical targets, our focus is on the medium-term "issues." In short, Toray Group management implements "programs to address issues," in the belief that forecast results and numerical targets will follow after solving each issue.

Intense Tenacity Helps Create Business Opportunities

Toray Group's intense tenacity is second to none. This attribute is also a feature in the Group's commitment to a "long-term continuity" approach. For example, the advent of an era in which carbon fibers, which are light, strong, and do not rust, would be widely used in the manufacture of aircrafts, was readily predictable. However, many companies withdrew from this field as a result of difficulties in securing profits in the short term. Under these circumstances, we discovered alternative applications for carbon fiber in the manufacture of such items as fishing rods and golf clubs. On this basis, we have tenaciously continued with the development of new technologies. More than four decades have now passed since these R&D efforts began. Today, carbon fiber composite materials are used as structural materials in the manufacture of all aircrafts. Application has also expanded to automobiles, and Toray Group's carbon fibers have forged an unwavering position as the market



leader. This “long-term continuity” approach, which serves as a wellspring for the creation of business opportunities, is not limited to carbon fiber. We are broadening this approach to encompass a wide variety of materials.

All Answers can be Found at the “Genba” (Workplace)

Toray Group’s commitment to a “Genba” (Workplace) approach is also a key defining feature. The very essence of Toray Group’s management is grounded in its comprehensive understanding of conditions at the workplace and the decisions made from a long-term perspective. The source of our competitive advantage is the ability to create value by drawing on the technologies and expertise accumulated at the workplace as well as our ability to evaluate multifaceted opportunities and risks based on a wealth of knowledge. By keeping a close eye on each workplace and understanding the true nature of activities, we are better placed to clarify what needs to be done and how to resolve issues. Our focus on the workplace is therefore maintained on a daily basis with important decisions, on whether to act or not and whether to continue or suspend operations, made in conjunction with onsite input. This approach to position workplace information at the heart of management is employed in the resolution of issues by all divisions and departments including production, sales and marketing, and research and technological development.

About the Plastic Free Movement

Despite signs of a growing global movement to go plastic free, plastics have historically helped enrich people’s lives. While recent debate tends to focus on the negative impact that plastics impose, it is imperative that attention is directed toward the issue of disposal and how best to promote effective use. We recognize the need to reduce plastic usage and the importance of advancing recycling across the entire supply chain while putting in place the necessary incentives.

As far as film packaging materials and the reduction of plastic usage are concerned, steps are being taken to lower the amount of use through thin-layer formation technology, the replacement of containers with films, and ongoing efforts to cutback food loss. From a recycling perspective, we have

been engaging in business activities that employ materials derived from the collection of PET bottles and paying particular attention to the recycling of carbon fiber reinforced plastic. Moreover, we are conducting research and development into plant-based bio-PET, working toward the production of various chemicals that use the cellulose from agricultural product residues as a raw material, and vigorously promoting the development of processing technologies for the manufacture of cellulose-derived sugar.

People-centric Management

Another noteworthy aspect of Toray Group is its “people-centric management.” Throughout our history, we have adhered strictly to the philosophy that “the success or failure of a company is decided by its people, and that employees shape its destiny.” Referring to the function of Toray Group’s inaugural production facility, the location of the Company’s foundation, Asahiko Karashima, as the first general manager of Shiga Plant also commented that “The Plant should be a place for the cultivation of human character. Companies should not only manufacture products, but also help develop human resources. People represent a key asset that is not posted to a balance sheet.” This concept remains a common thread throughout each generation of Toray Group’s management. Cherishing its employees, every effort continues to be made to instill a sense to loyalty and to enhance motivation. Making the most of this unique style of Japanese management, our employees are contributing significantly to the success of the Company over the long term. We are also seeing the growth of overseas employees who will guide our operations in the future. We are convinced that this is an extremely important factor that will help increase Toray Group’s long-term corporate value.

To this point, I have outlined details of the key concepts that underpin Toray Group’s corporate value: “long-term perspective,” “intense tenacity,” “Genba approach,” and “people-centric management.” I hope that all stockholders and investors evaluate the Company in light of these key words and ask for your continued support and understanding.

Akihiro Nikkaku

President

Sustainability Vision

Toray Group is an advocate of the idea that “materials can change our lives.” Guided by this unwavering belief since its foundation, the Group has faithfully followed a policy of “adapting to the times based on a long-term vision, rather than drift with the trends of each era,” and positioned efforts to contribute to society by providing innovative technologies and advanced materials as the foundation for its existence.

Meanwhile, as we face such issues as climate change, water scarcity, and the depletion of resources, the world in which we live is growing increasingly severe with each passing day. Exacerbating many of these problems, the world’s population is projected to reach around 10 billion in 2050. Against this backdrop of population growth and the continuous aging of society, the need to maintain and improve people’s health has also become an important issue.

Under these circumstances, we recognize the critical need to gather and apply the wisdom required to tackle the various challenges that the world faces in balancing “development” activities

Providing Innovative Technologies and Advanced Materials to Help Address Global Issues

with the importance of maintaining “sustainability” as a corporate group that engages in economic activities that consume global resources.

With a view to showing our efforts to contribute to society through the promotion of business and approach to reducing any associated environmental burden as well as our medium- and long-term initiatives to address, we announced details of the Toray Group Sustainability Vision in July 2018, which incorporates The World as Envisioned by Toray Group in 2050, Toray Group Initiatives to achieve this, as well as Quantitative Targets for Fiscal 2030.

As we look to the year 2050 and its image of the world from four distinct perspectives, Toray Group has identified issues that need to be addressed based on the value that it is capable of providing through innovative technologies and advanced materials. Moreover, we will work diligently to eliminate any negative impact on the global environment and sustainability as a result of our growth and development. At the same time, we will engage in Group-wide activities in an effort to resolve a variety of issues and work to achieve global targets including sustainable development goals (SDGs) together with worldwide partners.



TORAY SUSTAINABILITY VISION

The World in 2050

A net zero emissions world, where greenhouse gas emissions are completely offset by absorption

Accelerating measures to counter climate change

A world where resources are sustainably managed

Realizing sustainable, recycling-based use of resources and production

A world with a restored natural environment, with clean water and air for everyone

Providing clean water and air

A world where everyone enjoys good health and hygiene

Contributing to better medical care and hygiene for people worldwide

Toray Group's Contributions

Quantitative Targets for Fiscal 2030
(The baseline year for quantitative targets is fiscal 2013)

Supplying Life Innovation Products

6fold

Supplying Green Innovation Products

4fold

Reducing Water Consumption per Unit of Sales

30% Reduction

Reducing GHG Emissions per Unit of Sales

30% Reduction

Annual Water Filtration Throughput

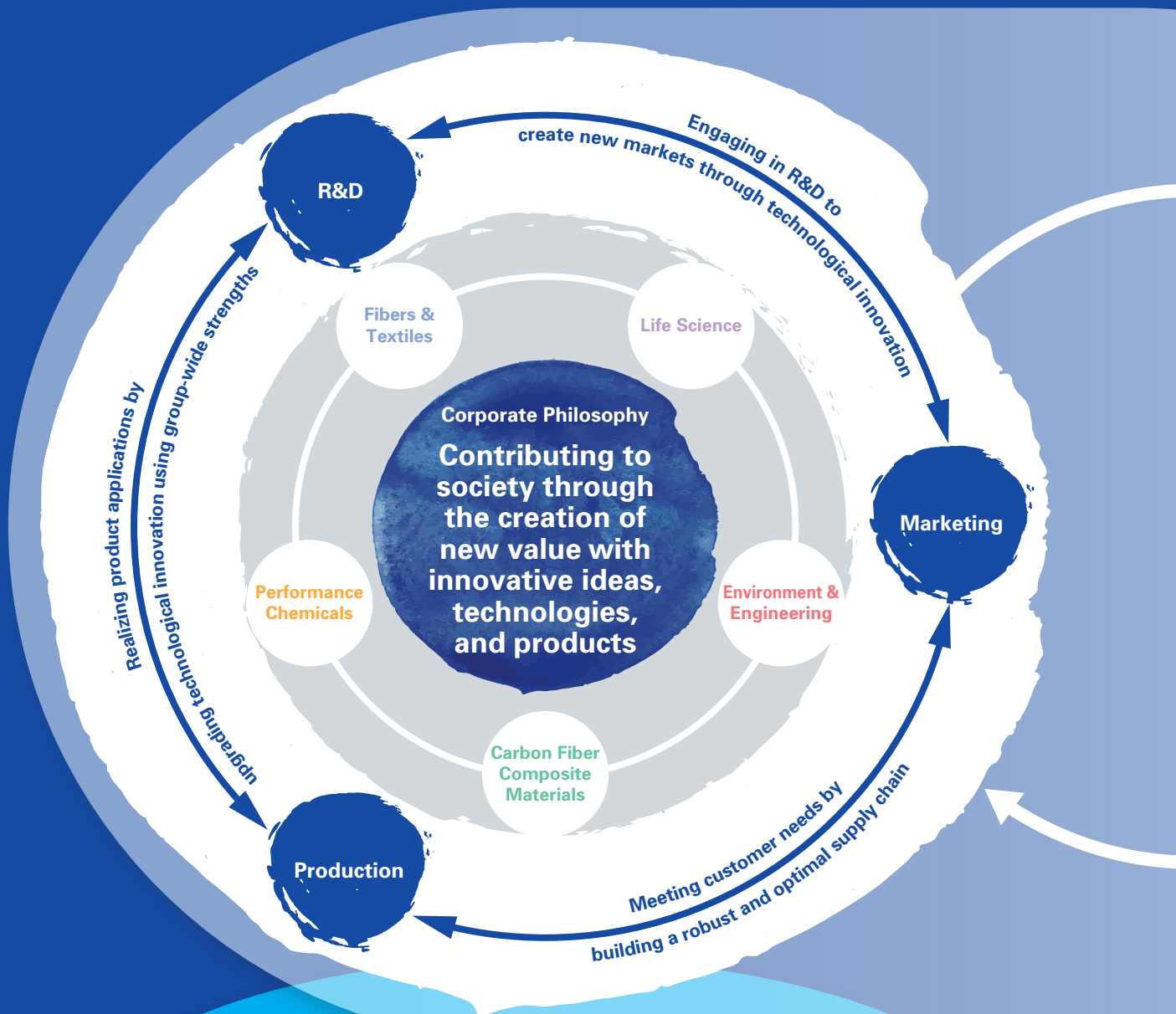
3fold

Toray's Value Creation Process

that enable it to "Contribute to society through the creation of new value with innovative ideas, technologies, and products"

Toray Group has continued to place the utmost importance on efforts aimed at contributing to society through business activities. While management from a long-term perspective that best reflects the requirements of the times, the Group has also engaged in people-centric management. Drawing on each of these core values since our foundation, we have worked diligently to pursue a process of co-creation with every customer that makes up the supply chain while ensuring mutual collaboration between our inherent R&D, marketing, and production strengths. Through these means, Toray Group is endeavoring to crystallize the four features of the world envisioned under its Sustainability Vision.

VALUE CREATION

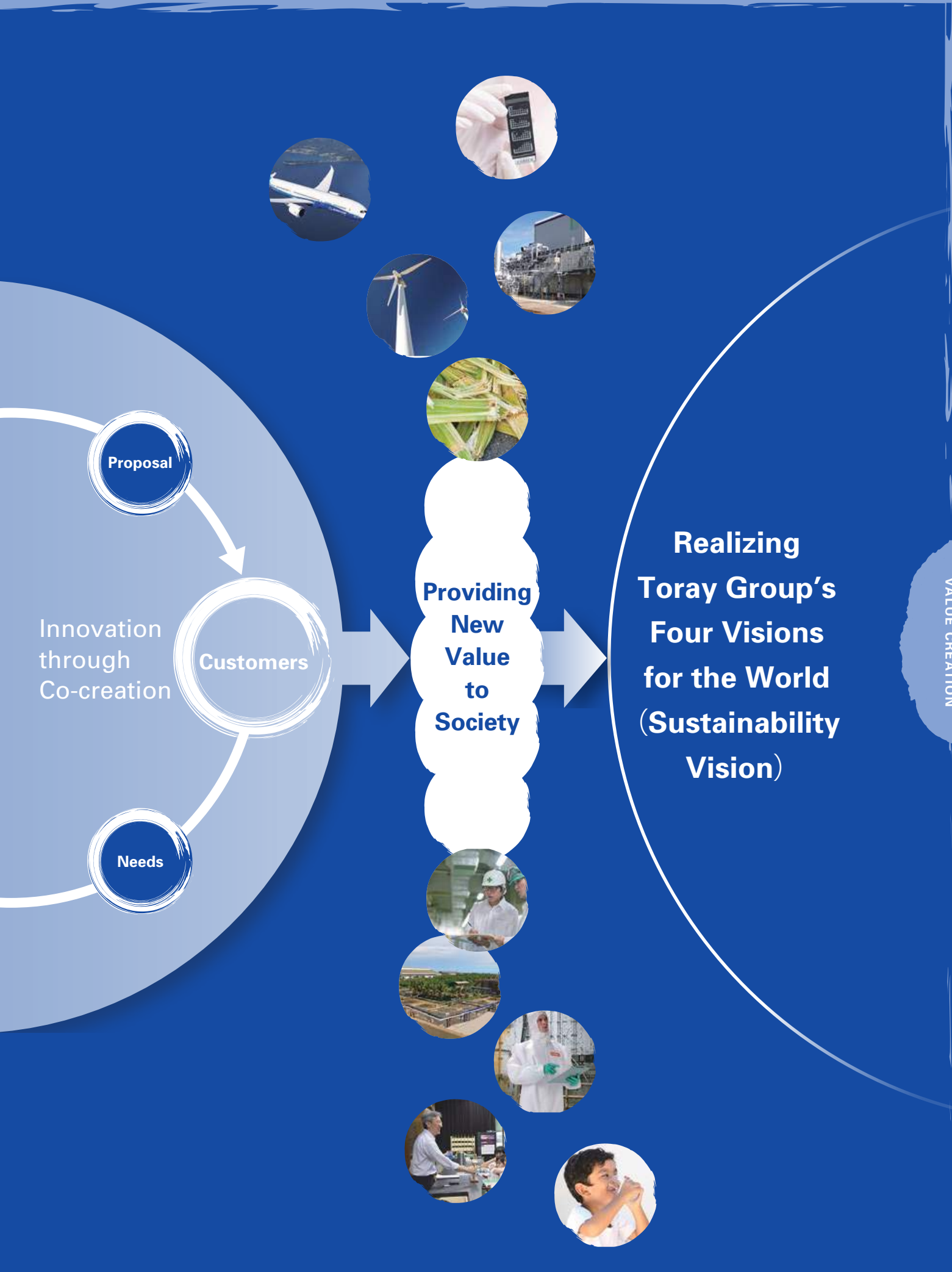


Value that we cherish as management Core Value

Contributing to society through business activities

Management from a long-term perspective

People-centric management (employees shape the destiny of a company)



Innovation through Co-creation

Proposal

Customers

Needs

Providing New Value to Society

Realizing Toray Group's Four Visions for the World (Sustainability Vision)

VALUE CREATION

An Advanced Materials Manufacturer That Gives Shape to Advanced Industries

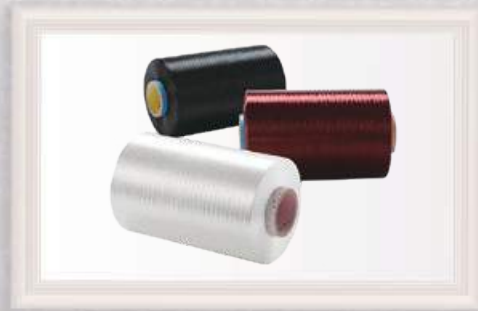
Since our establishment, we have positioned “contributing to society” as the focus of our existence. Carrying this focus into our corporate philosophy of “contributing to society through the creation of new value with innovative ideas, technologies, and products,” we have created a succession of materials that bring unprecedented levels of value to the world and forged a globally leading presence as an advanced materials manufacturer that gives shape to advanced industries.

1926

Began as a manufacturer of viscose rayon

The former Mitsui & Co.* was an importer of rayon yarn from Courtaulds PLC of the U.K. for sale in Japan. Mitsui established Toyo Rayon Co., Ltd. based on the national policy promoting Japanese industrial manufacturing. At the inaugural meeting on January 12, 1926, Yunosuke Yasukawa—at the time a managing director of Mitsui & Co.—acted as a representative of the incorporators and stated his hopes that the company would generate “major benefits for the national economy.”

* Note that the former Mitsui & Co. was a completely different corporate entity with no legal connection to the present-day Mitsui & Co.



1941

Succeeded in the synthesis and melt spinning of Nylon 6 fiber using proprietary technology

Developed using proprietary technology, “Nylon 6” has created new markets as a new fiber that can be applied in fishing nets as well as apparels such as stockings.

Polyester Film
Global Share
No.1



1959

Manufacture of LUMIRROR® polyester film began

Toray was the first company in Japan to industrialize polyester film. Positive steps have been taken to address market growth and to adapt to changing conditions and circumstances while gaining a share across a wide range of fields such as video tapes, industrial materials, specialty products, and others.

1955

Company principle established

“Toyo Rayon contributes to society” was identified as the Company’s original principle. Shigeki Tashiro, the Company’s chairman at that time, states “Just like individual people, companies have a social responsibility to improve the society in which they live.”

Luxury
Non-woven
Fabric with
Suede Texture
Global Share
No.1



Carbon Fiber
Global Share
No.1



1971

Marketing of ESCAINE®, ultra-microfiber non-woven fabric with suede texture, began

ESCAINE® is a non-woven fabric with suede texture using ultrafine microfibers. It was highly acclaimed as a fashion material for its lightweight and excellent chromogenic properties. Currently, it is being used in such areas as automobile interiors and furniture.

1971

Manufacture and marketing of carbon fiber TORAYCA® began

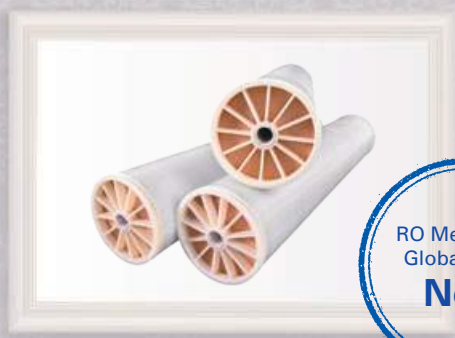
High-performance carbon fiber TORAYCA® features light weight, high tensile strength, and high stiffness. Sales activities commenced under the registered trademark “TORAYCA” from 1971.

1976

Marketing of TORAYCON® PBT resin began

Featuring outstanding long-term heat-resistance, chemical-resistance, weather resistance, and electrical characteristics, TORAYCON® is widely used in various connectors and other automobile parts, bobbins, coil cases, and other electronic and electrical components, and precision parts for office equipment.





RO Membrane
Global Share
No.1

1980

Marketing of ROMEMBRA® reverse osmosis membrane elements began

Research began in 1968 with ongoing development as a water treatment membrane. ROMEMBRA® enabled the production of ultra-pure water for the semiconductor industry and the desalination of sea and brine water.

'TORAY'

1986

The declaration of "A new founding" and a corporate philosophy was established to commemorate 60 years in business

We reviewed the Company principle and established a new corporate philosophy: "Contributing to society through the creation of new value with innovative ideas, technologies, and products." At the same time, we established our new corporate symbol as further commemoration of 60 years in business.



1990

TORAYCA® carbon fiber prepreg certified as a primary structural material for U.S. Boeing passenger aircraft

Initially the main applications of carbon fiber were fishing rods, golf shafts, and other sporting goods. Through improved technology and quality, the Company built up trust in this product as a secondary structural material in aircraft applications. In 1990, Toray prepreg was certified for the first time as a primary structural material (for structural parts where damage is directly linked to a crash) for the Boeing 777.

'TORAY'

Innovation by Chemistry

2006

Corporate slogan formulated

In April 2006, Toray Group created a new, long-term corporate vision—"AP-Innovation TORAY 21"—and adopted the corporate slogan "Innovation by Chemistry," declaring its aspiration "to become a global top company of advanced materials," while focusing on Chemistry.



2006

Strategic partnership started with UNIQLO CO., LTD.

As a company that provides innovative technologies and materials that have the power to fundamentally change society, Toray Group entered into a partnership agreement with UNIQLO CO., LTD., a company that enriches people's lives through clothes. Under this partnership both companies provide products that deliver new value and unprecedented levels of performance and comfort to people all over the world. The two companies are now in the third stage of the strategic partnership agreement.

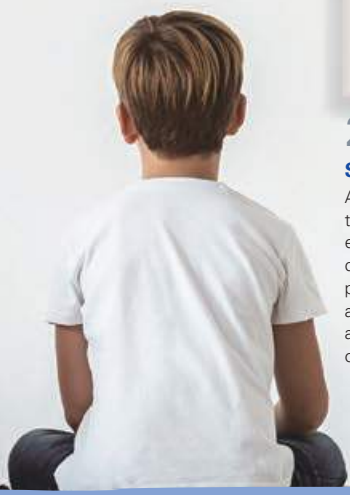


2016

Decided to establish the R&D Innovation Center for the Future as a project to commemorate the Company's 90th anniversary

Toray decided to establish the R&D Innovation Center for the Future at its Shiga Plant where the Company was founded, and will strengthen R&D to make people's lives better with *Kotozukuri* and value creation, which utilizes the strengths of advanced materials.

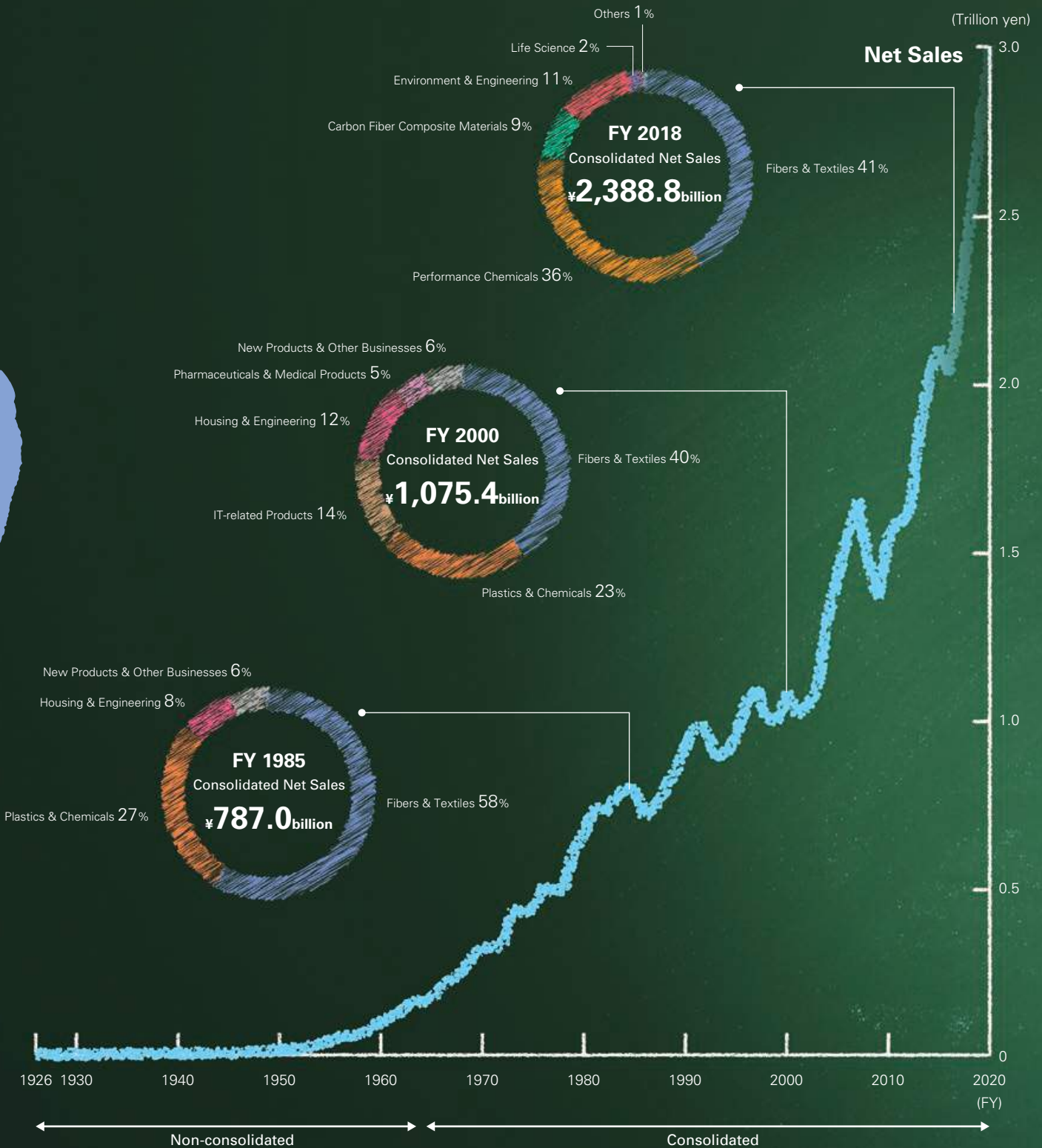
VALUE CREATION



Enhancing Long-term Corporate Value

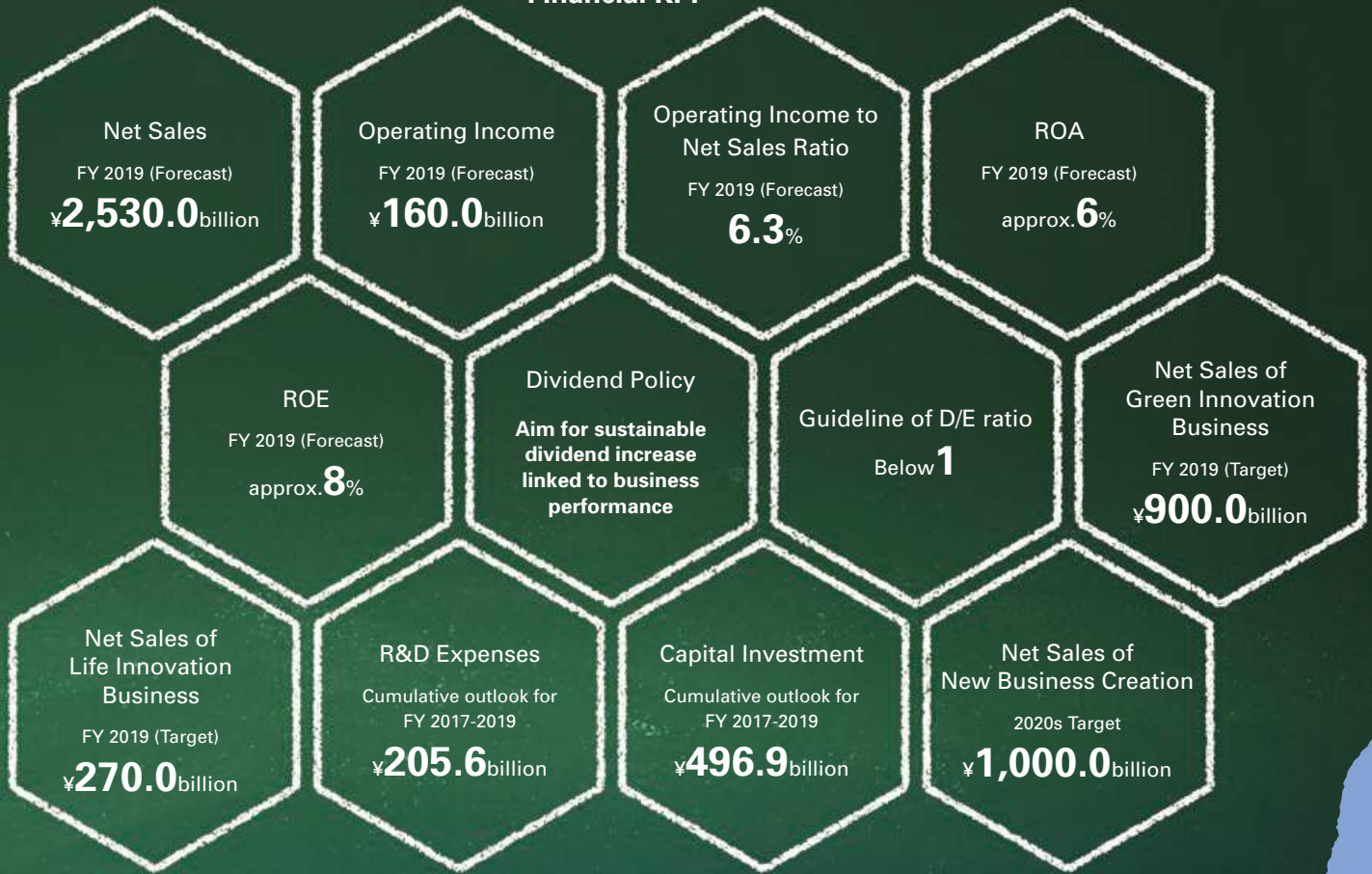
Toray Group began as a manufacturer of viscose rayon in 1926. On top of all three major synthetic fibers, nylon, polyester, and acrylic, the Company has continued to develop innovative technologies while creating a host of advanced materials and high value-added products in a broad range of films, chemicals, plastic resins, carbon fiber composite materials, pharmaceuticals and medical products, water treatment, and environmental fields. With an eye toward how society will evolve in 2050 and how innovative technologies and advanced materials may be utilized as a driving force, we will adopt a long-term perspective toward enhancing our corporate value.

VALUE CREATION

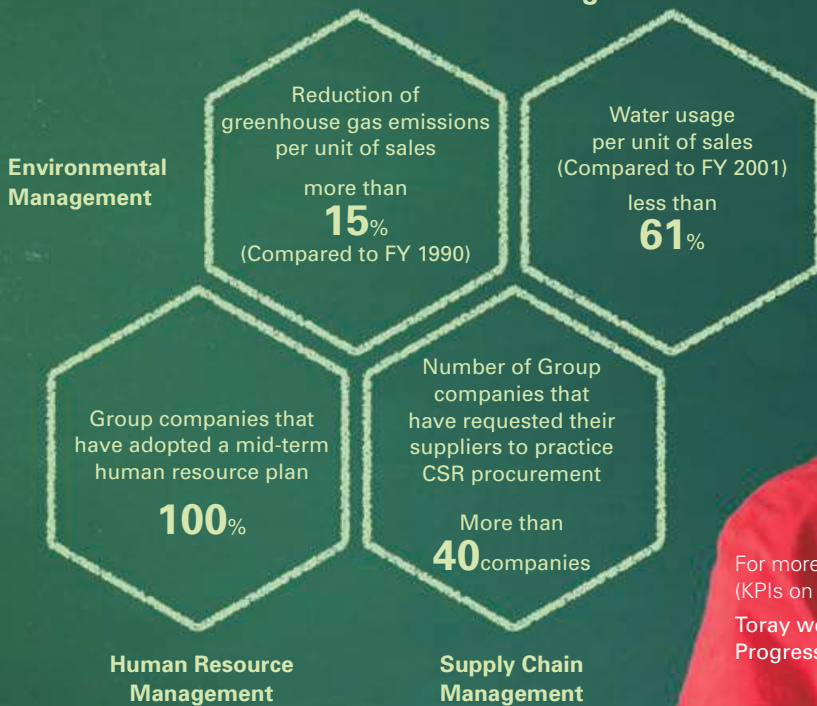


"US GAAP" for 1964 - 1983, "Japanese GAAP" after 1984

Financial KPI



Sustainable Related KPI (excerpt) FY 2020 Target



For more details, please refer to the following website (KPIs on promoting CSR):

Toray website > Social Responsibility > CSR Road Map and Progress on Key Performance Indicators

Inheriting the Ideas of “Long-term Continuity” and “Pursuit of the Ultimate Limits”

The phrase, “The Deeper, the Newer,” has been passed down as a key phrase at Toray Group, and has become part of the Group’s DNA. The concept underlying this is that when you dig deep into something and pursue it to its ultimate limit, the result will be new discoveries and inventions. An example of this would be the pursuit of the ultimate limits of film surface formation technologies. In the past, inorganic particles were added to the entirety of the film to create random projections on the surface, but Toray Group developed a technology that thinly laminates particle-based polymers on the film surface, with the particles aligned and the protrusion height carefully controlled. This technology contributed greatly to the success of the Company’s high-quality resolution video film business. While the appearance of DVDs signaled the end of the videotape market, the technology itself has been applied to other applications, including for data tape film and in support of the manufacturing process for polarizers and ceramic capacitors. Our focus on

Cultivating Business Seeds with the Potential to Create New Value

VALUE CREATION

Toray’s
Strengths

01

Research and Development

pursuing advanced technology stems from our belief that over time, the most advanced technology will likely be used in an increasing number of applications.

While it is true that it takes a certain amount of time to develop and commercialize advanced materials, the steadfast commitment to long-term continuity which is inextricably linked to the pursuit of the ultimate limits has become a hallmark of Toray Group. As an example, reverse osmosis membranes used in water purification and carbon fiber composite materials, which are among the Company’s mainstay products, took nearly a half century from initial research to large-scale market formation.

The strength of our R&D stems from the ability of the Group to recognize the long-term value of materials and the will to follow through, i.e., adhering to the concept of long-term continuity and the pursuit of the ultimate limits. This focus is the source of our hard-to-imitate competitive advantage and the wellspring of true innovation.

Toray Group has continued to invest in R&D without regard to fluctuations in the economy, and for many years has seen no substantial change in R&D costs as a percentage of sales, which serves to illustrate that innovation at the Group is based on the idea of long-term continuity and pursuing the ultimate limits.

Technology Center

Technical departments in
Business Divisions

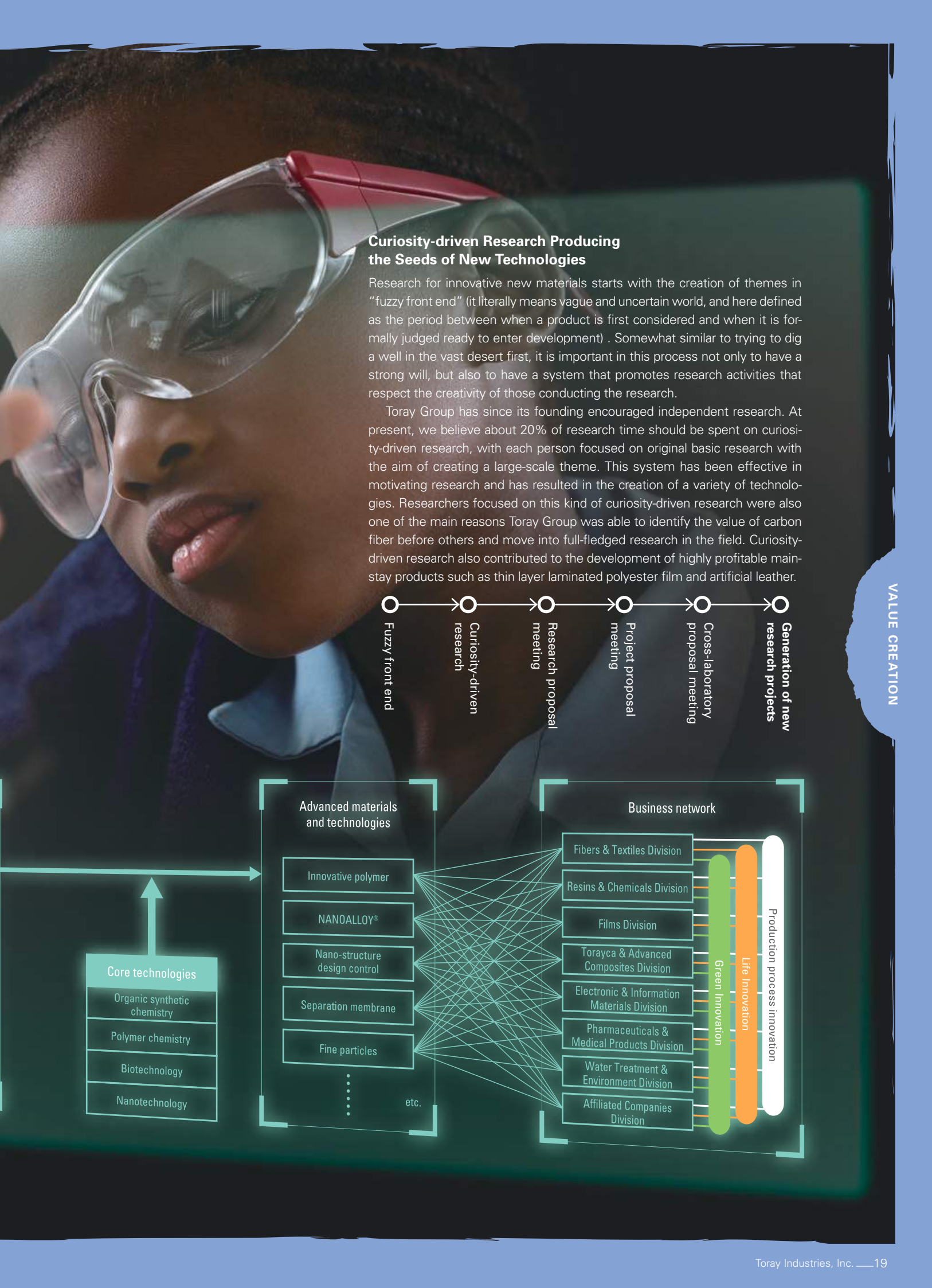
Development Center

New Projects
Development Division

Technical departments in
Manufacturing Division

Engineering Division

Research & Development
Division



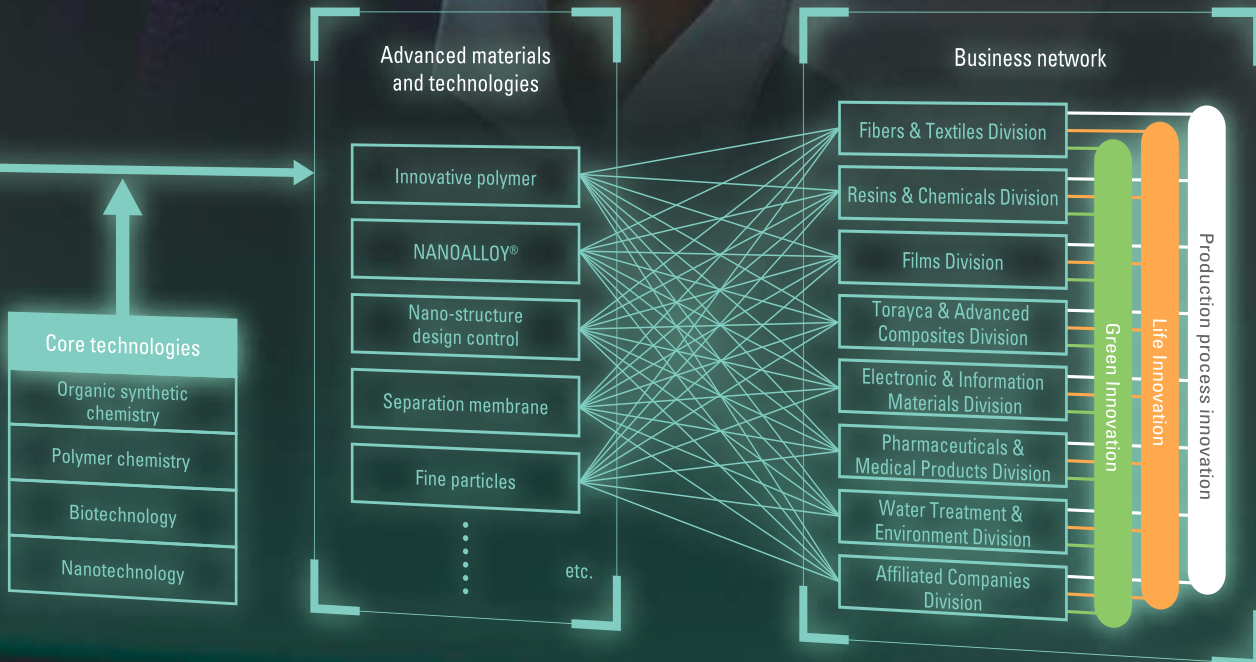
Curiosity-driven Research Producing the Seeds of New Technologies

Research for innovative new materials starts with the creation of themes in “fuzzy front end” (it literally means vague and uncertain world, and here defined as the period between when a product is first considered and when it is formally judged ready to enter development) . Somewhat similar to trying to dig a well in the vast desert first, it is important in this process not only to have a strong will, but also to have a system that promotes research activities that respect the creativity of those conducting the research.

Toray Group has since its founding encouraged independent research. At present, we believe about 20% of research time should be spent on curiosity-driven research, with each person focused on original basic research with the aim of creating a large-scale theme. This system has been effective in motivating research and has resulted in the creation of a variety of technologies. Researchers focused on this kind of curiosity-driven research were also one of the main reasons Toray Group was able to identify the value of carbon fiber before others and move into full-fledged research in the field. Curiosity-driven research also contributed to the development of highly profitable mainstay products such as thin layer laminated polyester film and artificial leather.

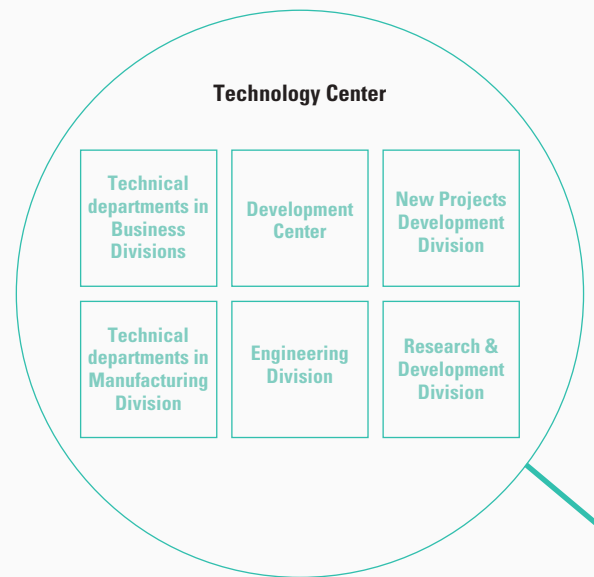


VALUE CREATION



Everything Derived from “four core technologies”

At first glance, it could appear that Toray Group business portfolio is diversified across a wide range of segments. However, all of these segments are built on our four core technologies. In addition to the organic synthetic chemistry, biotechnology, and polymer chemistry technologies the Company has focused its efforts on since its founding, Toray Group has added nanotechnology, the pursuit to the ultimate limits, as a fourth core technology. Using these four technologies, Toray Group is promoting greater depth and fusion of fundamental technologies such as polymerization, spinning, fibers application processing, film processing, and organic synthesis. The Group is also creating advanced materials and developing businesses in the fields of textiles, films, resins, chemicals, electronic & information materials, carbon fiber composite materials, pharmaceuticals, medical devices, and water treatment. All of these products have the four core technologies in common, which contributes to the likely emergence of technological synergies, and Toray Group is able to produce materials with even higher added value thanks to its various businesses combining the innovative technologies and advanced materials derived from these four core technologies.

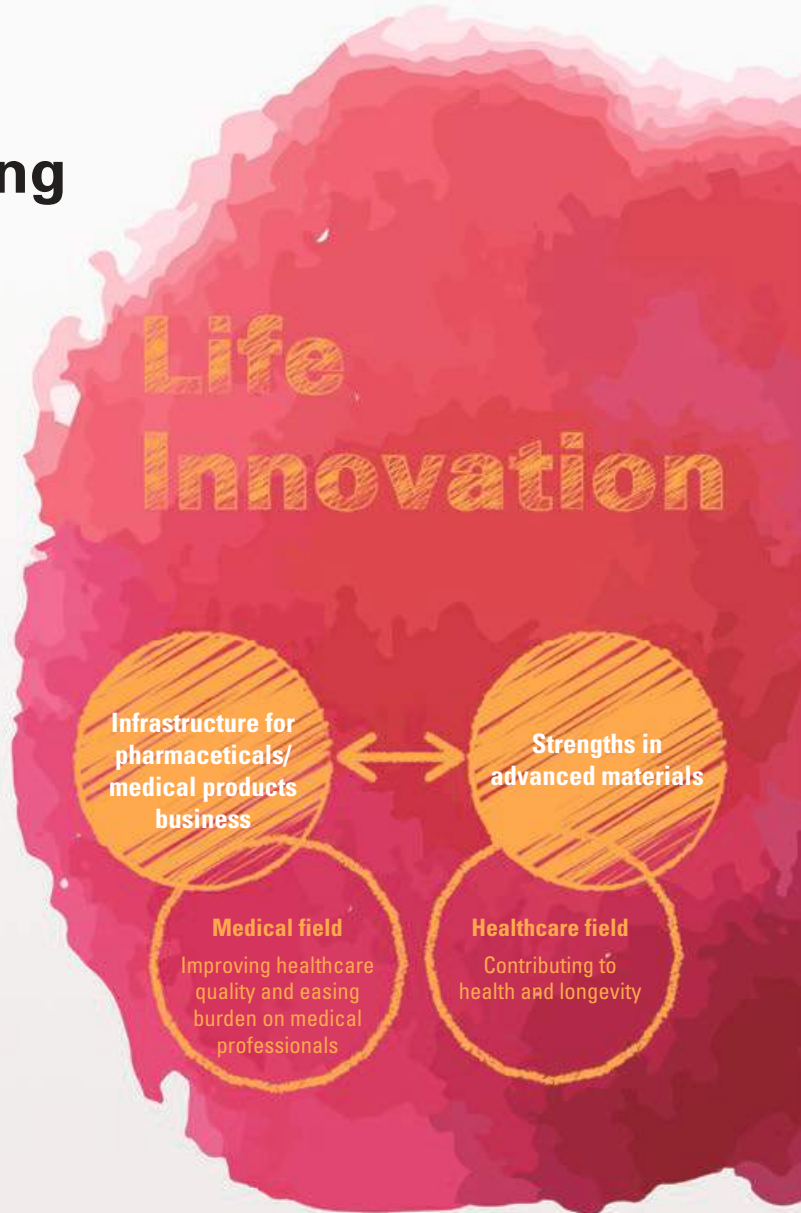


Solving Problems Using the Results from Core Technology Research and Development

An Undivided R&D Organization

Toray Group has centralized all of its R&D functions into a single organization called the Technology Center. Bringing together specialists from many fields in this undivided R&D organization makes it easier to create new innovations by integrating technologies. Moreover, the system enables the Group to exhibit combined strength by actively exploiting techniques and knowledge from many fields to solve problems in a single business area. It also enables various advanced materials and technologies to rapidly apply to multiple businesses.

With a focus on solving some of the issues facing the world, we are also developing Green Innovation Business and Life Innovation Business as Group-wide projects, based on the fusion of technologies. Using a one-package system centered on the Technology Center as a hub, we are focused on promoting the use of innovative technologies and advanced materials derived from our four core technologies in other fields, with the goal of maximizing returns on annual R&D investment of about ¥70 billion.



Green Innovation

Creation of Non-petroleum Materials

High-efficiency in Energy Use

New Energies

Water Treatment Membranes

Organic Synthetic Chemistry

Polymer Chemistry

Core Technologies

Nanotechnology

Biotechnology

VALUE CREATION

In addition to commercializing innovative materials, Toray recognizes the critical need to put forward proposals that dramatically increase the value of customers' products. With this in mind, Toray Group moves beyond the simple supply of materials, and works diligently to advance solutions that address customers' issues on the back of commonly shared visions.

Toray began the full-fledged production of commercial carbon fiber in 1971. Given the absence of carbon fiber market when we started, it was imperative that we take steps to create the market from scratch, while developing processing and molding methods, either on our own or in collaboration with customers. At the outset, we focused on the sporting and leisure fields, where a certain level of demand could be expected if the performance of products was high even when materials were a little expensive. As a result, we were successful in creating the market in the fields of fishing rods, golf clubs, and tennis rackets.

In contrast aircrafts, an area Toray Group targeted for carbon fiber sales in the long run, was hit by the first oil crisis in 1973. This set off the ongoing search for lighter weight, energy efficient materials by aircraft manufacturers, demand for carbon fiber reinforced plastic (CFRP) gradually increased for the use in the secondary structures of aircrafts, such as rudders. Based on the track record, The Boeing Company adopted plans to apply CFRP as a primary structural material (for structural parts where damage is directly linked to a crash) in its Boeing 777 in 1980,

Sharing Visions with Customers while Creating Markets

Toray's Strengths

02

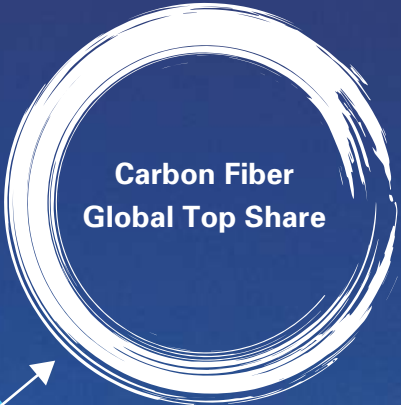
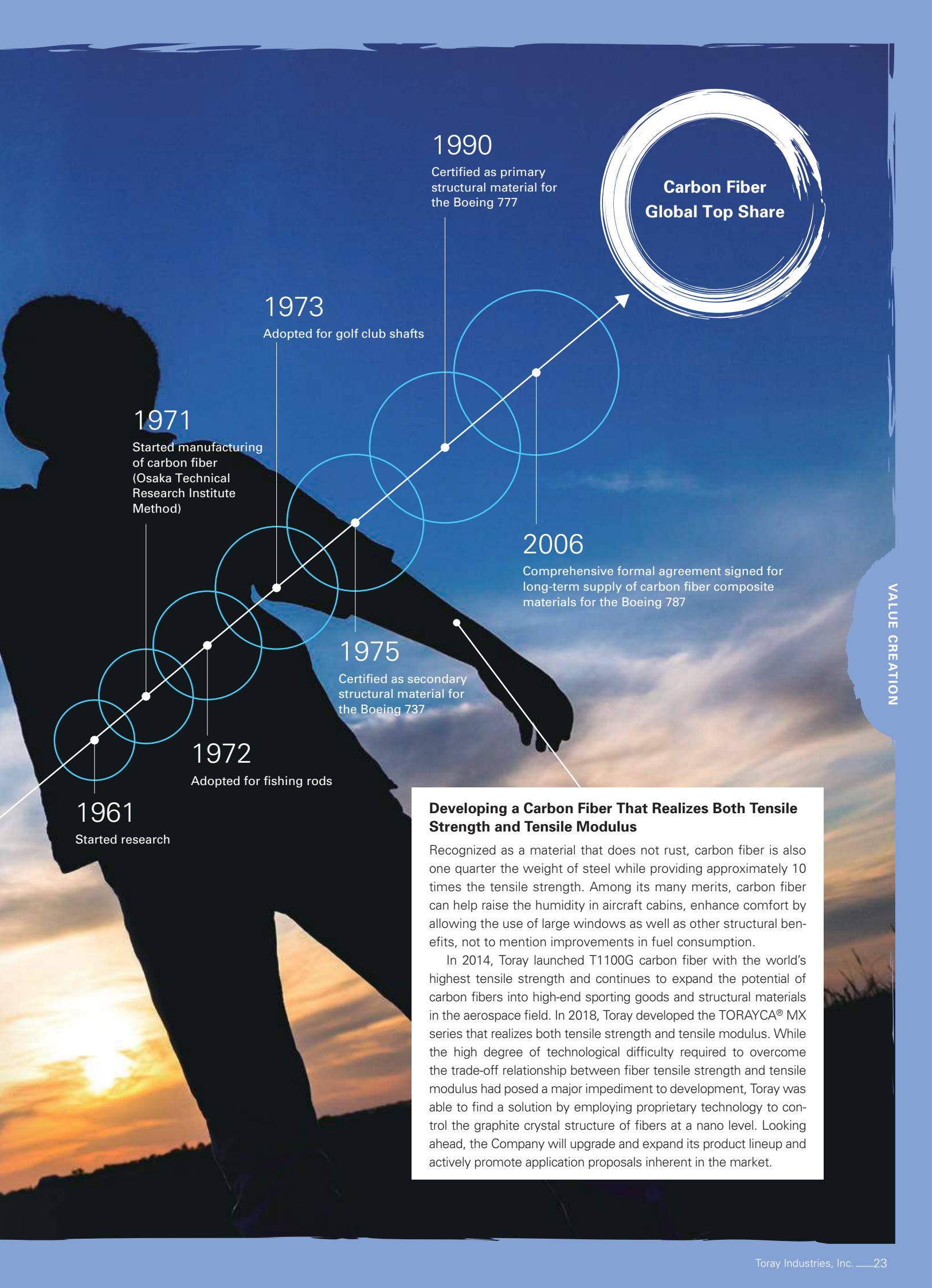
Marketing

and requested global manufacturers to step up their development of high-performance carbon fibers as well as CFRP. Against the backdrop of an increasingly competitive environment in the development of new technologies by each company, our product was certified as the world's first and only product which cleared the specification requirements put forward by The Boeing Company in 1990.

Our product has been recognized for its reliability as a material used in the manufacture of aircrafts, as well as for its stable supply and cost performance. Through a process of interactive technology exchange, Toray and The Boeing Company have continued to engage in the development of next-generation aircrafts, while nurturing strong ties of mutual trust. In 2003, both companies commenced the joint development of a CFRP for use in the next-generation medium-sized passenger aircraft the Boeing 787. After executing a fundamental agreement for the supply of materials in 2004, the companies concluded a long-term 16-year comprehensive supply contract in 2006. Spurred by the hope that carbon fiber would be adopted as a core material in the manufacture of all aircrafts, Toray has continued to engage in development. In a major step toward crystalizing visions of Toray Group and The Boeing Company, the Boeing 787, for the first time in the world, entered service across domestic flights in Japan in 2011. Over the ensuing period, the Boeing 787 operations have been expanded to service routes around the world.

Indicative of the widespread growth of the carbon fiber market, and our strong belief that materials have the power to bring about fundamental transformations in society, we are sharing visions with customers while providing broad solutions that help realize those visions as our inherent strength. As a result of these endeavors, we are expanding manufacturing markets in which materials play a leading role.





1990

Certified as primary structural material for the Boeing 777

1973

Adopted for golf club shafts

1971

Started manufacturing of carbon fiber (Osaka Technical Research Institute Method)

2006

Comprehensive formal agreement signed for long-term supply of carbon fiber composite materials for the Boeing 787

1975

Certified as secondary structural material for the Boeing 737

1972

Adopted for fishing rods

1961

Started research

VALUE CREATION

Developing a Carbon Fiber That Realizes Both Tensile Strength and Tensile Modulus

Recognized as a material that does not rust, carbon fiber is also one quarter the weight of steel while providing approximately 10 times the tensile strength. Among its many merits, carbon fiber can help raise the humidity in aircraft cabins, enhance comfort by allowing the use of large windows as well as other structural benefits, not to mention improvements in fuel consumption.

In 2014, Toray launched T1100G carbon fiber with the world's highest tensile strength and continues to expand the potential of carbon fibers into high-end sporting goods and structural materials in the aerospace field. In 2018, Toray developed the TORAYCA® MX series that realizes both tensile strength and tensile modulus. While the high degree of technological difficulty required to overcome the trade-off relationship between fiber tensile strength and tensile modulus had posed a major impediment to development, Toray was able to find a solution by employing proprietary technology to control the graphite crystal structure of fibers at a nano level. Looking ahead, the Company will upgrade and expand its product lineup and actively promote application proposals inherent in the market.

Since the dawn of the synthetic fibers market shortly after the end of the Second World War, Toray Group has not only supplied materials to primary users such as spinning companies and fiber merchants, but has also focused its energies on promoting the use of new material brands, including “Nylon” and “Tetoron” throughout the supply chain, from wholesalers to distributors. As the market for ready-made garments from brand-name apparel manufacturers increased in the 1960s–1970s, Toray organized its domestic production team, largely in Hokuriku manufacturing region, for the weaving, spinning, dyeing, fiber processing, and knitting segments, contributing to the establishment of an integrated fiber and textile business model.

The Group moved to accelerate global operations in the 1980s and 1990s, advancing the establishment of an integrated production system that covered everything from fiber to dyeing, in Southeast Asia and China.

The turn of the century saw strong growth in SPA (specialty store retailer of private label apparel) and fast fashion businesses. The SPA business model is very different from the traditional product-out business model, in which production is maintained at a constant level at each stage. In the SPA business model, production immediately reflects consumer behavior based on data collected at the store, bypassing interim distributors and allowing companies to completely sell out products while avoiding both excess inventories and lost sales opportunities.

Building a Supply Chain Unrivaled in the World with Our Powerful Partners

VALUE CREATION

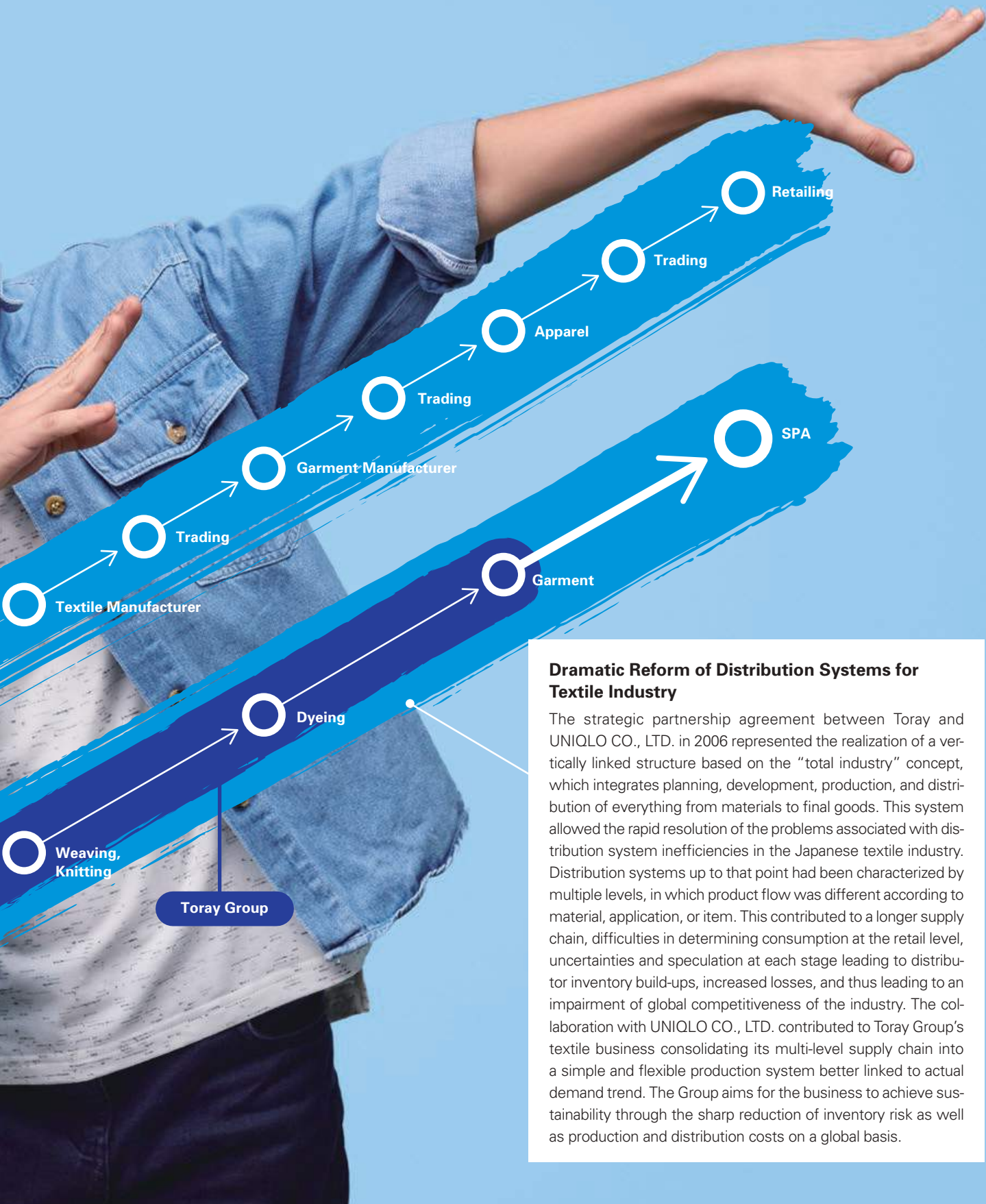
Toray's
Strengths

03

Supply Chain Management

Toray Group had the production technology capable of mass producing high-quality products, as well as a strategy for the global textile business that was well suited to the SPA mechanism. The Group also had a robust R&D system for the development of new and unique products. The Company in 2006 agreed to a strategic partnership with UNIQLO CO., LTD. and thereafter reformed the distribution system for fibers & textiles. The two companies moved to bridge the boundaries between a material manufacturer and a specialty store retailer of private label apparel (SPA), establishing an unprecedented business model in the world in which the two operated together as a virtual company that handled planning, development, production, and distribution for everything from raw materials to finished products. This contributed to the establishment of a global supply system, with production bases being located not only in China, but also in the ASEAN countries and Bangladesh. The Company has since continued to expand its integrated fibers, textiles, and garments business. Toray remains focused on building and operating a global supply chain network that can organically tie together a variety of processing stages and quickly deliver products with identical levels of quality thanks to the optimally located, efficient, and cost competitive production bases. Toray's building of a supply chain system unparalleled in the world contributed to the radical transformation of distribution systems in Japan, and appealing Japanese technology to the world, which has added new value to the textile industry.





VALUE CREATION

Dramatic Reform of Distribution Systems for Textile Industry

The strategic partnership agreement between Toray and UNIQLO CO., LTD. in 2006 represented the realization of a vertically linked structure based on the “total industry” concept, which integrates planning, development, production, and distribution of everything from materials to final goods. This system allowed the rapid resolution of the problems associated with distribution system inefficiencies in the Japanese textile industry. Distribution systems up to that point had been characterized by multiple levels, in which product flow was different according to material, application, or item. This contributed to a longer supply chain, difficulties in determining consumption at the retail level, uncertainties and speculation at each stage leading to distributor inventory build-ups, increased losses, and thus leading to an impairment of global competitiveness of the industry. The collaboration with UNIQLO CO., LTD. contributed to Toray Group’s textile business consolidating its multi-level supply chain into a simple and flexible production system better linked to actual demand trend. The Group aims for the business to achieve sustainability through the sharp reduction of inventory risk as well as production and distribution costs on a global basis.

Guided by our basic policy of global management that emphasizes the need to take root over a long period in order to contribute to the economic development of the countries and regions where we operate our businesses, Toray Group's overseas production activities began with the establishment of a subsidiary in Thailand to provide integrated spinning, weaving, and dyeing of polyester-rayon fabric in 1963. As a Japanese company, Toray engaged in local production from an extremely early period. Beginning with Southeast Asia during the 1960s and 1970s, the Company's global network expanded to Europe and the U.S. in the 1980s, and then to the Republic of Korea and China in the 1990s. The Group has established production bases for such items as films and carbon fiber, in addition to fibers and textiles. Today, every effort is being made to promote organic collaboration among Group bases in Japan and overseas. Through these means, Toray is building an optimal global production and supply structure that adapts flexibly to changes in the business environment in line with market, foreign currency, and other trends. Furthermore, successful steps are being taken to create a production system that can supply high-quality products on a stable and continuous basis in any region.



Working to Secure Sustainable Growth on a Global Scale through Organic Collaboration Among Production Bases

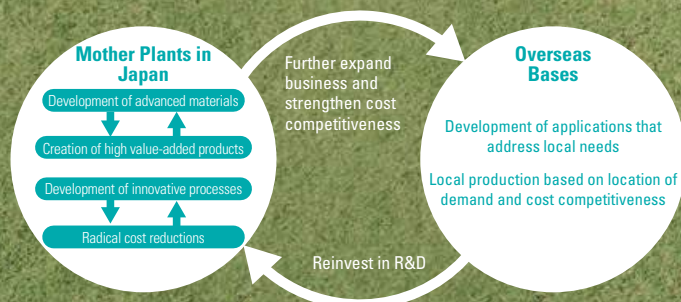
VALUE CREATION

Toray's Strengths

04

Global Production System

As of the end of fiscal 2018, Toray Group's network expanded to 26 countries worldwide. Accounting for 55% of the Group's total revenue, overseas sales amounted to roughly ¥1,300 billion. In contrast, the Group's overseas production ratio substantially exceeds its sales ratio. More than 75 to 80% of such principal products as fibers and textiles, resins, films, and carbon fibers are manufactured outside of Japan. Drawing on its global production system as a source of considerable strength, Toray Group is implementing a sustainable growth cycle. In specific terms, we are undertaking cutting-edge innovative research and development at our mother plant in Japan, while at the same time adopting a strategy to establish local production systems swiftly and flexibly from the perspectives of demand and cost competitiveness. Complementing these endeavors, we are also promoting the development of applications that cater to local needs at each production base. This in turn enables us to capture new profit opportunities.



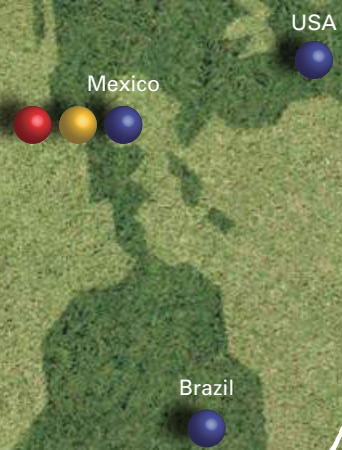


Asian Airbag Textile Market



- Fiber Production and Sales 3 countries
- Textile Production and sales 6 countries
- R&D Center 2 countries
- Marketing 8 countries

Americas Airbag Textile Market



Working to Secure the Leading Position in Airbag Textile through a Global Integrated Production System

The airbag market is exhibiting rapid growth due to upswings in the number of automobiles sold in emerging countries as well as installation rates. In its airbag fibers & textiles business, Toray Group began the integrated production of a wide range of products from fibers to textiles in Mexico from 2018 as a part of efforts to further reinforce its global production system. Currently, Group companies manufacture airbag fibers in three locations and airbag textiles in six locations worldwide, respectively, under the global production system that is capable of providing airbag textiles of a uniform quality in a timely manner across the Group's entire network. As a result of these efforts, Toray Group is highly praised from a business continuity plan (BCP) perspective. Going forward, we are aiming to secure the top market share in the global airbag textiles market where strict quality control and reliability of products are required.

VALUE CREATION

Special Feature
R&D Dialogue



First of all, please tell us about your points of contact between Toray and science.

Abe | It really is an honor to be able to talk science with you Dr. Noyori, a recipient of the Nobel Prize in Chemistry. The results of your research into chirally catalyzed hydrogenation reactions became useful technologies that are widely used in the production of compounds, including pharmaceuticals. I have heard that your contacts with Toray date back a very long time.

Noyori | My family has long had a connection with Toray, or Toyo Rayon as it was back then. My grandfather and Asahiko Karashima, the company's future second chairman, were relatives and childhood friends from the same hometown, and I recollect hearing from my grandmother words that Mr. Karashima reportedly said, "If you lick it, rayon melts like glue."

What sparked my interest in science was Dr. Hideki Yukawa becoming the first Japanese Nobel laureate in the impoverished period right after the end of the Second World War. Many young boys held on to aspirations of emulating Dr. Yukawa, and I, at that time, an elementary school pupil, was one of them. Then, just prior to entering junior high school, my father, who was a researcher at a major chemical company, took me to a presentation on Toyo Rayon's nylon product development, where the president back then, Kikuo Sodeyama, introduced nylon as "an epoch-making product that is made from coal, water, and air." Since that was a time when people had nothing, I was impressed to learn even then that "chemistry is just like alchemy in that it can turn something worth nothing into things of value." This "Nylon Incident" gave me added impetus that led me to get enthusiastic about studying science. Added to

We All Dreamed About

which, as I always used to hear my father say at mealtimes, "The companies with money depend on overseas technology, and that is no good. To get back on its feet, Japan should focus on developing domestic technologies." As I grew up in such an environment, I aimed for and entered Kyoto University Faculty of Engineering, which has strengths in chemistry. I had thought that someday I would like to aim to become a researcher at Toyo Rayon. When

Koichi Abe

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

Born in 1953

Completed Master's Degree (Physical Chemistry),
Graduate School of Engineering Science, Osaka
University

1977 Joined the Company (Films & Film Products
Research Laboratories)

2005 Vice President and General Manager of
Research & Development Division

Since 2014 Executive Vice President and
Representative Member of the Board

I entered graduate school, however, I was enthusiastic about research and, having been recommended by the professor supervising my work, chose the path of remaining there with the aim of becoming a researcher. But, after having bounced around from one place to the next, I have become deeply involved with Toray as an outside director over the past four years, so my dream came true, and I am finding it very rewarding.

Abe | What led me to have an interest in science was not some lofty motivation like that of Dr. Noyori, but the *Astro Boy* manga series. A child of science, jet propulsion, 100,000 horsepower, a nuclear-powered hero fighting for justice...I received strong messages that science exists for and contributes to society, and vaguely wanted to somehow contribute to society myself through science when I was older. Later, I attended a public high school where I could choose a mathematics and science course from the first grade. The science classes there were not centered on classroom lectures, but a repetitive experience of experimenting by replacing basic principles with macro models. My teacher at that time would give fervent speeches about famous sayings from Nobel Prize winners, and I remember one that seemed to resonate with me in particular was something that Pasteur is supposed to have said: "Chance favors the prepared mind." I interpreted this as "Lady Luck smiles on those who continue to be aware of problems," and that is still my motto. Also, when the teacher gave us a problem of estimating the number of soybeans packed into a plastic case, you run out of time if you try to calculate it properly. I was taken aback by this. In fact, it taught the importance of intuition. Those kinds of unconventional courses aroused my curiosity about science all the more.

In my university days, as a researcher, I had knowledge hammered

Becoming a Scientist

into me, such as "Predict the answer before experimenting. The experiment provides confirmation," "Before conducting an experiment, think carefully about whether the experiment is really necessary," and "If you conduct a two-hour experiment, take at least twice as much thinking time in the laboratory." One day, by changing an experiment's procedure, a phenomenon completely different from the conventional prediction had occurred, and the professor supervising my work told me "We are having a company to file a patent application for your research." That company was Toray.

It was with that kind of relationship that I joined Toray and was initially assigned to the Films & Film Products Research Laboratories. Here too, little things I became aware of and an awareness of problems when conducting one research theme provided hints for setting the next theme. At Toray, key phrases like "The deeper, the newer" and "Pursuit of the ultimate limits" have been handed down over the years, but the result of having instilled them in me was that we developed the thin film lamination technology for magnetic tape, New Surface Topography (NEST), for which we won an Okochi Memorial Production Prize.



Ryoji Noyori

Outside Director, Toray Industries, Inc.

Born in 1938

Graduated from Kyoto University

Doctor of Engineering, Distinguished Professor, Nagoya University

2000 Received Order of Culture from Japanese Government

2001 Received Nobel Prize in Chemistry for the development of chirally catalyzed hydrogenation reactions

Since 2015 Outside Director, Toray Industries, Inc.



Intense tenacity is a strength based on a typically Japanese trait, and this the biggest barrier to entry for new market entrants.



In what areas do Toray's R&D fortes lie?

Abe | First of all, Toray doesn't express research and technological development as the one combined term in Japanese, unlike such as R&D in English, and always puts a break in between, research and technological development. Research is like creating one from zero, in other words akin to digging a well, whereas technological development is recognizing that you will fabricate a target quality product in a fixed time for a fixed cost. Having made the distinction between research and technological development in this way, we build one-package systems in which these elements are not divided into two and that I manage in my capacity as general manager of the Technology Center or CTO.

Secondly, at Toray, we identify the value of materials with a broad vision of the times and have that culture of persistently pursuing the ultimate limits with a focus on basic research attitude. In global competition, this intense tenacity is a strength based on a typically Japanese trait, and I consider this the biggest barrier to entry for potential new market entrants. As exemplified by carbon fiber, which became the main structural material for aircrafts more than half a century after the start of research, the culture of commitment to the "Pursuit of the ultimate limits" has built up a host of successful experiences and we continue to reap the benefits to this day.

Finally, the reason why we have a Technology Center is to integrate Toray's research and technological development functions and bring together experts from a variety of fields. The existence of this organization enables the development of advanced materials created in one field to be deployed in other fields. Occurrences of fusions of technologies are also facilitated. One example is the "DNA Chip," which is expected to detect various types of cancer from a small amount of blood and was created by the shared knowledge of biotechnology and nanotechnology experts. Also, to solve the problems associated with carbon fiber and water treatment membranes, we are demonstrating our

comprehensive strengths by utilizing technologies and knowledge from different fields to solve issues in one business field, such as the medical-field researchers who are lending their support to organic synthetic chemistry technologies.

Noyori | Toray has earned a very high level of trust from society by having each of its businesses provide products based on proprietary technologies. It might well be that Toray's comprehensive strengths, in which a wide range of knowledge and technology can bring about innovation across businesses, are a feature unrivaled by other companies. However, in unforgiving competition with European and U.S. companies, which always follow bold selection and concentration policies, and Asian companies with their low-cost production capabilities, Toray must be careful not to expand its business domain too far so that its relative competitiveness is not lost.

Abe | I agree with you. If researchers were to be given a free rein in the setting and management of research themes, management resources would be scattered and research efficiency would decline, making it impossible to win against fierce competition. Having said that, in maintaining technology-based management having an environment that draws out the free ideas of researchers is of absolute necessity. This we thus call "underground research," and at Toray, researchers are encouraged to spend about 20% of their working hours conducting discretionary preliminary experiments and investigations without reporting them to their supervisors. Carbon fiber and my development of NEST arose from underground research.

However, when moving from the research stage to the development stage, because we will create a pilot plant and need a lot of raw materials and people, it is impossible to do everything. Deciding what to invest in is the real thrill of management, but since it is a very hard decision to make, I make a point of making a judgment after trying as much as possible to quantify the extent of its value. Moreover, since this is an age in which our integral technologies are being caught up in the blink of an eye, we carefully examine whether it is a theme that would enable us to demonstrate Toray's strengths in the years to come, not just transiently. Priority is also given to those themes that have a high affinity with Toray's business and technological foundations and that cannot be built overnight. I call this "appropriateness for the Company" and is something to which I attach great importance. We are advancing to development stages when we can build up an exact picture of where to get value for money from the technology, where we could earn income in the value chain and how to build a business model that minimizes risk and maximizes return.



It is said that it is difficult for innovation to happen in Japan. What are your thoughts on this issue?

Noyori | Japanese companies are often said to "win in technology and lose in business." Since projects do not advance to the development stage despite their high potential and are poorly converted into value, Japanese R&D expenses tend to be perceived as costs rather than investments. Just because a project did not reach the commercialization stage, however, does not necessarily mean that the technological level was inferior, and there are many "premature inventions"

that the times have not caught up with. If, a few years later, an idea were to undergo huge transformation outside the company that had first thought of it, that would be a story of extreme wasted effort.

We should not be passive with regards to markets, but instead gather information, look out across the world and proactively make proposals that make use of our inventions and technologies. Japanese companies have keen “insect eyes” to view one thing intensely and precisely, but I think we have more of a need to develop “bird’s eyes” to have a panoramic, bird’s-eye view of things and “fish eyes” to sense as yet unrevealed phenomena and signs.

Then, as we enter the age of “value co-creation” on a worldwide basis, there is another problem in that Japanese people are not aware of the differences between groups and teams. A group has the meaning of a “flock” that occurs spontaneously based on homogeneity, whereas a team is an “organization” that has an artificially defined purpose. Since the traditional Japanese spirit of “doing something while maintaining precious harmony” has its origins in flocks, this exerts great influence in social stability and in the execution of routine tasks. However, the power of multiplication to create new value does not emerge from a homogeneous group. Solo musicians and vocalists are good in music, but in an orchestra format you have to bring together virtuosos for performances on a variety of musical instruments. And it will take an excellent conductor to hold them together. Unlike tug-of-war competitions, baseball and rugby games need players with different roles in order to win, and team lineups that are rich in diversity are essential. To speed up innovation, Japanese companies in particular should be aware that selecting different people, not closed groups, forms winning teams. Because Silicon Valley is able to do that, startups succeed. They benefit from investing in innovative ideas, bring together diverse talent from around the world with that capital, and create the strongest teams.

Another thing I would like to add is that I think science and technology also requires art, or perhaps I should say, an element of sensitivity. At advanced technology universities, not only in Europe and the United States but also in Asia, there is an increasing number of art departments that inspire sensitivity. There are many Toray researchers with excellent STEM (Science, Technology, Engineering, Mathematics), but having added Art, the people who possess a sense of STEAM will become indispensable for future business development.

Naturally, company research should be conducted not for solving immediate problems but for creating new value for the future. Society is vast. Researchers and engineers tend to attack a research theme with established logic, but unless they possess the “creativity” to provide “imagination,” they will not be able to create things the world wants. In that sense, the approach that says an expert will realize something with the ideas from an amateur is also important. Isn’t it also important, however, to adopt various sensibilities and think about innovation with soft ideas, such as from sales and marketing departments that are in contact with customers on a daily basis, people who are sensitive to life or employees who attended art schools who possess more keenly developed intuition and “feel”?

Abe | To respond to Dr. Noyori’s suggestions, Toray is now in the process of building the R&D Innovation Center for the Future and is aiming for its completion in December 2019. The Center



To win in business, Japanese companies should be aware of forming winning teams rather than closed groups.

will consist of an integrated research building, which will fulfill an ideas creation function, and an experimental research building that will promote the prototype production, assessment and demonstration of products developed on the basis of those ideas. The plan is for the Advisory Board to also welcome people from the areas of humanities and social sciences. Instead of the Center serving just as a technological development base for *monozukuri* (manufacturing), we are exploring the functions and mechanisms necessary for the future society and trying to conduct *kotozukuri* (the creation of added value) using the strengths of materials. The Center will also fulfill an innovation hub function, such as an international conference hall, exhibition/demonstration area, and open lab, and accelerate strategic open innovation through exchange, fusion, and collaboration with academia and important partners in various fields.



Please tell us more about the importance of open innovation.

Noyori | The days when a company could singlehandedly undertake everything, from research to technological development, have passed. In the pharmaceutical industry collaboration with external research institutes and startups has become commonplace. Innovation has a difficult birth from the traditional large companies with entrenched organizations. What is effective instead is an “ecosystem” in which various structural elements function cyclically and efficiently, like the ecosystems in the natural world. In other words, as a strategy, it is important for Toray to regard its own technologies as the core, to create high value-added products while utilizing external technologies and capital, and build the mechanisms to continuously generate revenue. The Toray Technology Center is not a place to lock up the accumulated knowledge and technology in a safe. To bring about innovation, Toray should actively promote not only internal use but also the integration of technologies with the outside, and I think that Executive Vice President and CTO Abe’s role, in the control tower overseeing operations, is of great importance.

Abe | I think Toray originally had an ethos of what we now call open innovation, but around the year 2000, the Company was particularly concerned about self-sufficiency. However, in the fiscal year ended March 2002, when Toray (unconsolidated) recorded a loss in operating profit, we earnestly reflected on that particular commitment and established the New Frontiers Research Laboratories in 2003. However, looking back, the basic invention of carbon fiber was that of Dr. Akio Shindo of the Osaka Technical Research Institute (now the National Institute of Advanced Industrial Science and Technology (AIST) Kansai). Toray quickly realized its value, received a patent license, and has persistently continued research and technological development. I think this is exactly what open innovation is all about. I would like to reaffirm that kind of activity and thereby bestow a meaningful function on the R&D Innovation Center for the Future.



In the sense of science for solving social issues, the marine plastics pollution issue is coming under intense scrutiny. Please tell us about the efforts that Toray is making in this regard.

Abe | Resolving the marine plastic pollution issue is positioned as a priority theme at Toray. However, just because something is made from biodegradable plastic, it does not mean that it will easily biodegrade when thrown away into seawater. The misunderstanding that plastic immediately biodegrades may conversely encourage more dumping. Giving consideration to such possibility, Toray is focusing on recyclability. For example, most packaging bags commonly used in supermarkets are plastic films but they are made in combination with multiple materials. By reducing the material to one type of film, we believe that recycling would be greatly encouraged.

Noyori | There is an increasing demand for materials that contribute not only to innovative functions, but also to a recycling economy. This is because the more useful the product, the more its negative impact, such as in the form of environmental problems, tends to increase. Research to efficiently produce oil-derived structures that realize breakthrough functionality will continue to be important. On the other hand, since Toray is a company that provides materials to all industries around the world, I think that it has a social obligation to make effective proposals for environmental problems, including marine plastic pollution, by the power of materials. In addition, because Toray advocates that “materials can change our lives,” as a Toray supporter, I would like the Company to formulate and address “what should be done,” not at the level of doing “what can be done,” but in a leading role in solving these global issues.



What are your thoughts on human resource development that contributes to the world with the power of science?

Abe | Researchers and engineers who have made great achievements at Toray are not passive, have a high sense of purpose and mission, and are able to actively think and work, but they also are “people with extensive expertise backed by basic scientific capabilities.” However, the recent trend

at universities is that specialized fields have become limited and more extensive, but even after completing a master’s program in polymer chemistry, it seems that the basic scientific ability to see the entire picture, including the surroundings—the “bird’s eyes” that Dr. Noyori mentioned—seems to have declined. In the meantime, it has become no longer possible to create major new products from a single technology, and it remains difficult to produce significant results from research conducted in isolation. Moreover, the major subjects at universities and research themes at companies do not always coincide. Thus, people who can see things with “bird’s eyes,” who possess multiple areas of expertise, even if they are not the same depth, and who know the key points to look for when approaching unknown fields, are producing great results. These are the types of human resources on which we are focusing development.

To create a climate where one could concentrate on research and technological development for a long time, and in which young researchers could work hard to become “research professionals,” Toray established a Research Fellow System in 1992, and an Engineering Fellow System in 1998. We bestow the titles of Research Fellow or Engineering Fellow on research and technological development engineers who have achieved breakthroughs that have contributed to the Company or have demonstrated their professional leadership in either of those fields. As an effect of this, there are people with proficient skills at Toray. We have also compiled a collection of successful cases called “How I Proceeded with My Research,” about how breakthroughs have come about, and are making efforts to pass them on.

Noyori | People are drawn to people. Rather than learning what kind of a product was made, people are more interested in the routes taken to bring about success. I think it’s very good to pass on the efforts of successful people.

In my experience, the owner of an original idea is not necessarily an excellent student who can do anything, or a student with high academic grades. Rather, the ideas and behavior of honors students are said to be similar. It is a problem if everyone is outside the norm, but in making something that does not yet exist, you cannot ignore the ideas of eccentrics and stubborn researchers. I think that non-standard ideas will arise from those who have been self-taught since they were young and are in the habit of self-study. For that reason, it is not easy for them to abandon pet theories and they tend to be isolated in an organization, but regardless of that I think that it should be Toray that trains the non-conformists of this world.

In addition, it is clear that we are heading to an era in which data will be known as the second oil resource, and AI and big data will exert their influence. In that respect, it has become important to secure and train human resources who are strong in mathematics and statistics. As far as researchers are concerned, there was an awareness that digital technology is a means to do things efficiently, and that digitalization and systemization are somehow alien to a world of steady manual labor like chemistry. But this belief should be revised. The evolution of IT has enabled exploration with orders of magnitude and speed. In 10 years’ time, the chemical industry map will be filled with the colors of the



If you want to become a researcher, you will need the spirit to make a big hit.

Koichi Abe

companies that are data driven. Throughout the Company, Toray should aim to be the market leader in the new information-oriented society.



Finally, as a message to the researchers and engineers who will be leading the coming era, please tell us what kind of human resources Toray is seeking.

Abe | In the words of our late honorary chairman, Katsunosuke Maeda, Toray is seeking for human resources who “have a discerning eye for change and possess the power to see through the essence of the matter” and are capable of “independently tackling their own issues head-on.” This has not changed and will not change. On top of that, I think that even a company with sales exceeding ¥3 trillion will start to decline if it loses its spirit as a collective of startups. To be honest, in the past, I was researching films with the spirit of “making a big hit.” I still feel that pioneer in me saying, “I will change Toray with my own strength. I will change the world with my own strength.” I would like everyone to possess that degree of fearlessness.

Noyori | I would like young people who are full of intelligence and sensibility to fully recognize the current trends in a world where the way things are in modern civilization are being questioned, to fully utilize their talents upon coming to Toray. Toray is aiming for global recognition as an excellent company. Based on Toray’s philosophy that is similar

I would like scientists to live in a world they themselves have created.

Ryoji Noyori

to CSV (Creating shared value), which balances economic profit activities and the creation of social value, the company is staking its future on the Green Innovation Business Expansion Project and Life Innovation Business Expansion Project. What is meant by life here?

Toray should aim not only for innovation for life but also for innovation of livelihoods and lifestyles. These will become possible only after reflecting the will of society. There is a host of opportunities for Toray to do that.

I know from personal experience that science makes great contributions to society and is a truly rewarding life occupation. I would like young scientists who are breaking new ground toward the future, to live in a world they themselves have created, not one given to them by others. Possessing that spirit, I hope that they can depict the future society the way it should be, by cooperating with a variety of people.

As one of the Company’s directors myself, I am aware of my responsibility to those who will be responsible for the future of Toray. Yoshikazu Ito, who himself developed a nylon manufacturing method utilizing photosynthesis, and changed the company name from Toyo Rayon to Toray after taking office as president, and focused on developing business in the non-textile sector, said, “It is easy to just improve business results over the short term. The president’s job is to sow the seeds for the generation after next.” This spirit of management has been passed down to Toray’s current president, Akihiro Nikkaku. I, too, would like to support management with that kind of spirit.

Overview of Toray Group's Performance in Fiscal 2018 (The Fiscal Year Ended March 31, 2019)

Record High Sales Against the Backdrop of a Harsh Profit Environment

With the goals of becoming a corporate group that continually increases revenues and profits while offering high value to all stakeholders, Toray Group formulated the long-term corporate vision "AP-Growth TORAY 2020 (abbreviated as "Vision 2020")" in 2011. Under this vision, we have set our sights on sustainably increasing revenues and profits. In specific terms, we are targeting consolidated net sales of ¥3 trillion, operating income of ¥300 billion, and ROE of 13% around 2020.

The current medium-term management program, "Project AP-G 2019," which covers the three-year period from April 2017 to March 2020, is the third stage of Vision 2020. Under Project AP-G 2019, we are carrying out three growth strategies with focus on taking advantage of growth business fields, pursuing business expansion in growth countries and regions, as well as further bolstering its cost competitiveness. At the same time, we are promoting initiatives aimed at creating new sources of earnings that will help drive Toray Group through a period of sustainable growth from 2020 onwards and enhance corporate value.

During the period under review, the global economy as a whole continued to recover gradually, underpinned by the strong U.S. economy amid prolonged pressure from the uncertain future weighing on the economy, but the pace of growth slowed in the second half of the fiscal year due to intensified trade frictions and the notable deceleration in the Chinese economy. The Japanese economy continued on its gradual recovery track, as

both the corporate and household sectors remained steady in general, although there were some weaknesses in exports and production toward the end of the fiscal year. At the same time, however, the rise in raw material and fuel prices had a negative impact on Toray Group's profit.

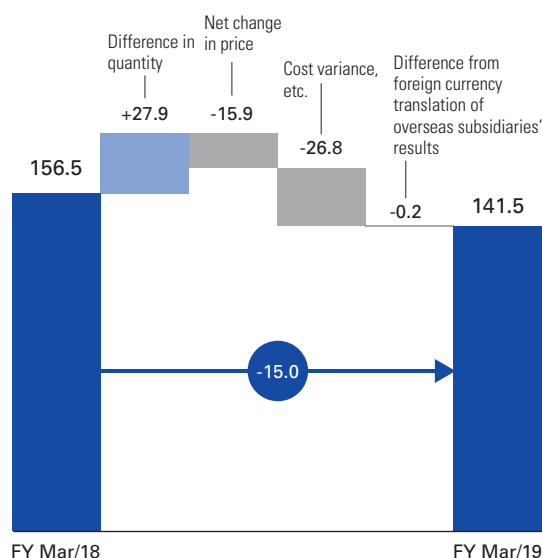
Under these circumstances, Toray Group's consolidated performance saw year-on-year increases in net sales across all segments excluding the Life Science business. In specific terms, consolidated net sales surged to a record high, climbing 8.3% compared with the previous fiscal year, to ¥2,388.8 billion. From a profit perspective, sales expenses increased on the back of sales expansion. At the same time, the Group incurred an upswing in production fixed costs. While steps were taken to pass rising raw materials costs on to selling prices, Toray Group was unable to fully pass on the raw materials price increase to the sales price. As a result, the Group reported a negative gap between raw material costs and selling prices. Taking into account each of these factors, consolidated operating income for the fiscal year under review came to ¥141.5 billion, down 9.6% compared with the previous fiscal year. Net income attributable to owners of parent was ¥79.4 billion, a year-on-year decrease of 17.2%.

As far as dividends are concerned, in light of the aforementioned performance trends, Toray Group set the annual dividend for fiscal 2018 at ¥16 per share, up ¥1 per share, for a dividend payout ratio of 32.3%.

Basic Issues of "Project AP-G 2019"

- 1 Proactively expand business in growth fields, countries, and regions
- 2 Improve profitability by continuously creating and expanding differentiated products
- 3 Steadily realize profit improvements through radical reforms both in business and organizational structures
- 4 Continue "strengthening of cost competitiveness" to reinforce and strengthen earning structure
- 5 Continue "pursuit of the ultimate limits" for the creation of new and innovative materials and create large-scale new businesses
- 6 Thoroughly implement "safety, accident prevention, and environmental preservation" and "business ethics and legal compliance" globally
- 7 Secure and develop human resources that can contribute to "strong workplace capability"

Income Variance Factor Analysis (Billion yen)



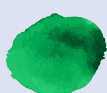
Medium-term Management Program: Project AP-G 2019

THREE BASIC STRATEGIES

01

Business Expansion in Growth Business Fields

Toray Group is working diligently to put forward the two Group-wide Green Innovation Business Expansion (GR) and Life Innovation Business Expansion (LI) projects.



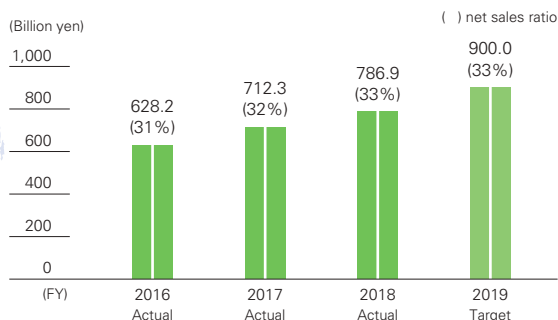
Green Innovation Business Expansion (GR) Project

In addition to preserving the global environment, Toray Group provides solutions that help address energy and resource issues while targeting business expansion. As a result, the Group takes every opportunity to reduce greenhouse gas (GHG) emissions, lower its environmental footprint, and to support the treatment of water, recycling, and air purification. In fiscal 2018, net sales from GR Project businesses were ¥786.9 billion, up 10.5% compared with the previous fiscal year.

Expanding Business in Fields That Address Issues such as the Reduction of GHG Emissions, Biomass, and Water Treatment

Under the fiscal 2018 GR Project, the decision was made to increase large tow carbon fiber production capacity at the facility in Hungary at Zoltek Companies, Inc., as a part of efforts to reduce GHG emissions. Moreover, the Company developed the new carbon fiber TORAYCA® MX series that realizes both higher tensile strength and tensile modulus. In the biomass field, we released Ultrasuede® BX, non-woven material with a suede texture that realizes the highest proportion of plant-based raw materials in the world. Turning to the field of water treatment, Toray Group commenced sales of the ROMEMBRA®TLF series, reverse osmosis (RO) membrane element ideal for the treatment of wastewater. The TLF series offers 30% higher permeability compared with current models, which in turn helps to significantly reduce operating costs. Utilizing a new membrane surface coating technology, the TLF series also lowers the frequency of replacement.

Net Sales of Green Innovation Businesses



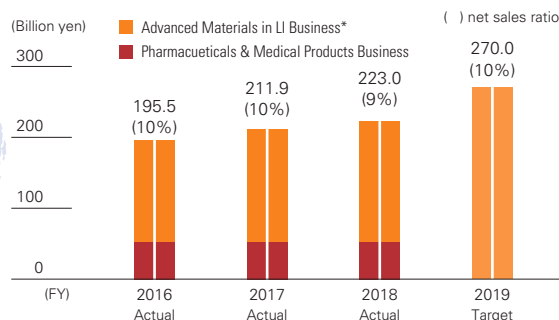
Life Innovation Business Expansion (LI) Project

Making the most of its management resources, Toray Group is working to expand its business by enhancing the quality of medical care, alleviating the burden of medical professionals, and contributing to the maintenance of health and longevity. In fiscal 2018, net sales from LI Project businesses were ¥223.0 billion, up 5.2% compared with the previous fiscal year.

Rolling Out the LI Project by Promoting Advanced Materials in Addition to Pharmaceuticals and Medical Devices

Under the LI Project, Toray Group upgraded and expanded its lineup of INOUE BALLOON™ expanding balloon mitral valvuloplasty catheters for use in aortic valves in the pharmaceuticals and medical devices fields. Moreover, the Company signed a license agreement with Meiji Seika Pharma Co., Ltd. on an orally disintegrating tablets formulation of the antipruritic drug TRK-820 developed and manufactured by Toray Group. The license allows Meiji Seika Pharma to exclusively develop and commercialize the product in Thailand and Indonesia. Meanwhile, every effort is being made to accelerate the rollout of the LI Project through advanced materials. Toray Group developed and commenced sales of hitoe®, a wearable monitoring system, for long-term medical use. In addition to acquiring the EU type examination certificate (CE marking) for its chemical protective clothing LIVMOA® 3000 series, the Company also developed LIVMOA® CL, a sterilized type of LIVMOA® comfortable disposable protective wear, for use in cleanrooms.

Net Sales of Life Innovation Businesses



*Toray Group estimation

Medium-term Management Program: Project AP-G 2019

THREE BASIC STRATEGIES

02

Expansion and Advancement of Global Business

Looking at conditions in which Toray Group operates, the need for advanced technologies in such wide-ranging fields as automobiles and energy is increasing in the U.S. and Europe. At the same time, standards of living are improving and environmental regulations becoming more stringent in China and emerging countries. Against this backdrop, Toray Group is working to expand its global business by capturing profit opportunities. In fiscal 2018, overseas sales were ¥1,271.3 billion, up 10.5% compared with the previous fiscal year.

Decision to Increase Production Capacity in the U.S. and Asia

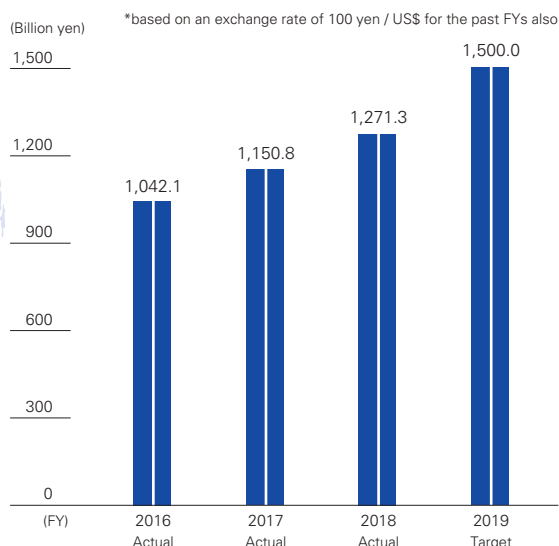
In a bid to expand and advance its global business, Toray Group ramped up efforts to increase production capacity in the U.S. and Asia. Turning first to India, the decision was made to establish a production facility for the nylon and polybutylene terephthalate (PBT) resin compounds used in such products as electronic components of automobiles and electrical and electronic connectors.

In Malaysia, Toray Group decided to increase its production capacity of its acrylonitrile butadiene styrene (ABS) resin TOYOLAC®. Operations are forecasted to commence in November 2020, in a bid to expand transparent-grade sales where the Group has the leading global market share. In China, positive steps were taken to establish a joint venture corporation to manufacture and market drinking water treatment facilities with ORIX Corporation and China Water Affairs Group Ltd.

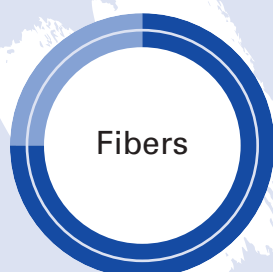
Moving on to the U.S., Toray Group decided to increase the production capacity of its polypropylene film TORAYFAN® in order to address increasing demand in the food packaging market. The aim is to commence operations from 2020.

Net Sales of Expansion and Advancement of Global Businesses

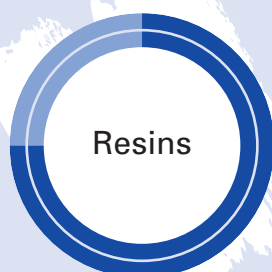
(Combined sales of overseas consolidated subsidiaries)



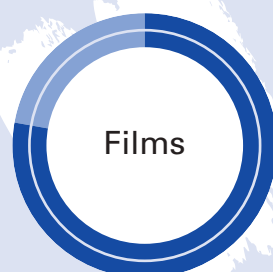
Overseas Production Ratio of Main Products (Production capacity at the end of March 2019)



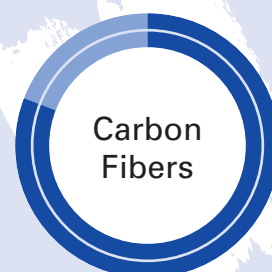
Overseas
75%
Domestic
25%



Overseas
75%
Domestic
25%



Overseas
78%
Domestic
22%



Overseas
81%
Domestic
19%

STRATEGY

Strengthening Competitiveness

In addition to the growth strategies of “business expansion in growth business fields” and “expansion and advancement of global business,” Toray Group is promoting efforts to strengthen its competitiveness from three specific perspectives: (1) total cost reduction, (2) strengthening its corporate structure, and (3) strengthening sales and marketing.

Total Cost Reduction

- ▶ Promote Total Cost Reduction (TC) Project on a Group-wide basis
- ▶ Activities of variable cost reduction (annual target at over 3.6%)
- ▶ Control fixed costs using the P-ratio* accounting method (P-ratio=under 0.96 each fiscal year)
- ▶ For innovation of the production process, identify themes by category in terms of “innovative cost reduction,” “large-scale total cost reduction” and “capacity increase of existing facilities” to achieve reduction effects by more than ¥50 billion in three years

Strengthening Corporate Structure

- ▶ Clarify issues of companies and businesses with profitability problems, and gather Toray Group’s collective efforts to improve revenue and profit
 - > options include reducing or withdrawing from businesses with limited growth potential or excessive competition
- ▶ Manage the Group’s assets effectively and expand revenue and profit

Strengthening Sales and Marketing

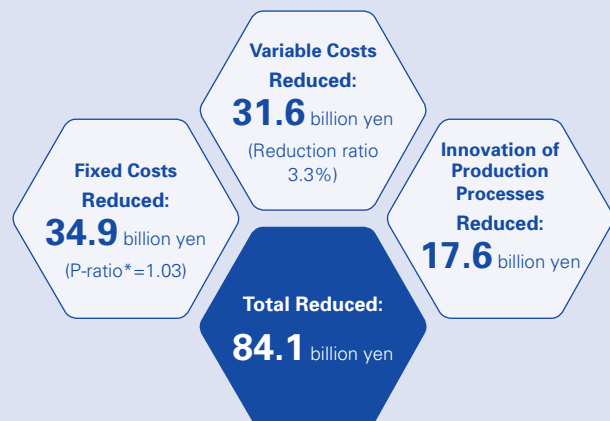
- ▶ Sales and marketing leads to build a “profit-making system” in cooperation with production, technology, R&D departments, and external partners
- ▶ Maximize the revenue and profit of existing businesses through improvements in price policies, distribution systems and brand initiatives

Carried out Total Cost Reductions That Exceed the Previous Fiscal Year

Under its Group-wide Total Cost Reduction (TC) Project, Toray Group is looking to curtail costs by a total of ¥220 billion over the three-year period from fiscal 2017 through cutbacks in variable and fixed costs as well as production process innovation. In fiscal 2018, successful steps were taken to reduce costs by ¥84.1 billion compared with ¥69.3 billion in fiscal 2017.

In a bid to strengthen the Group’s corporate structure, Toray Advanced Material Korea Inc. absorbed Toray Chemical Korea Inc. in April 2019 with the aim of creating further synergies and pursuing operational efficiency. Working to strengthen sales and marketing, Toray Group completed the acquisition of TenCate Advanced Composites Holding B.V., a company that manufactures and markets carbon fiber composite materials, in July 2018. By unifying the brand name to “Toray Advanced Composites” and increasing awareness, the goal is to consolidate the employees of each company both in name and substance while strengthening collaboration.

Total Cost Reduction Results of FY2018



*P (Performance)-ratio=fixed cost growth rate/marginal profit growth rate. Target: less than 1.0 or monitored by division under budget.

Performance Forecasts for Fiscal 2019

Working Toward Further Increasing Revenues and Profits by Strengthening the Company's Corporate Structure, Expanding Business, and Promoting Business Structure Reform

The global economy as a whole is expected to recover slightly from late 2019, though a slowdown is expected in the pace of growth primarily in China and the U.S. However, attention should be also paid to risk factors such as increasing trade friction between countries such as the U.S. and China, the downward swing in the Chinese economy and the outcome of negotiations for the U.K.'s withdrawal from the EU. The Japanese economy is expected to continue on a gradual recovery track on the back of improvement in the employment and income environment while growths in exports and production are likely to slow. Nevertheless, it is necessary to note the economic impact of uncertainties in overseas economies and the fluctuations in crude oil prices and in the financial markets.

Under these circumstances, Toray Group is projecting consolidated net sales for fiscal 2019 of ¥2,530 billion. From a profit perspective, the forecast for operating income is ¥160 billion and net income attributable to owners of parent is ¥93 billion.

Based on the aforementioned, Toray Group is expected to pay an annual dividend of ¥16 per share, unchanged from the fiscal year under review.

Taking into consideration the various trends over these three years, including the rise in raw material and fuel prices, increasingly fierce trade friction between such countries as the U.S. and China, and the downturn in the Chinese economy, operating conditions in which Toray Group operates have changed dramatically compared with initial forecasts. Accordingly, results are anticipated to fall below the goals identified at the time AP-G 2019 was initially set. In fiscal 2019, every effort will again be made to stringently control fixed costs. At the same time, energies will be directed toward carrying out a project that aims to address priority issues. With the full support of the Group, steps will be taken to accelerate the pace of problem resolution, expand business, and promote business structure reform.

Consolidated Business Forecast for Fiscal 2019

Billion yen

	FY 2019 (Forecast)	Changes
Net Sales	2,530.0	+5.9%
Operating Income	160.0	+13.1%
Net Income Attributable to Owners of Parent	93.0	+17.2%

Assumed exchange rate : 110 yen / US\$

Forecast by Segment for Fiscal 2019

Billion yen

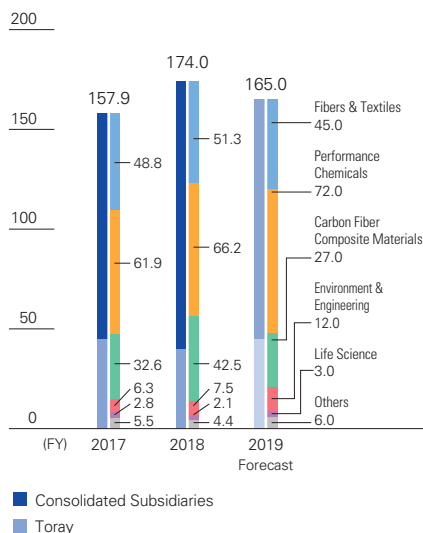
	Net Sales (Changes)	Operating Income (Changes)
Fibers & Textiles	1,000.0 (+25.7)	70.0 (-2.9)
Performance Chemicals	935.0 (+66.2)	81.0 (+13.3)
Carbon Fiber Composite Materials	250.0 (+34.1)	22.0 (+10.5)
Environment & Engineering	270.0 (+12.3)	14.0 (+1.8)
Life Science	55.0 (+1.3)	0.0 (-1.3)
Others	20.0 (+1.5)	3.0 (-0.1)
Adjustment	—	-30.0 (-2.7)
Consolidated	2,530.0 (+141.2)	160.0 (+18.5)

Promoting Capital Investments in Growth Fields with Focus on Overseas Businesses

As far as capital investments are concerned, Toray Group will look to reinforce facilities in growth fields with focus on overseas businesses. Plans are in place to undertake capital investments totaling ¥165 billion (depreciation and amortization of ¥113 billion) and R&D expenses of ¥73 billion in fiscal 2019.

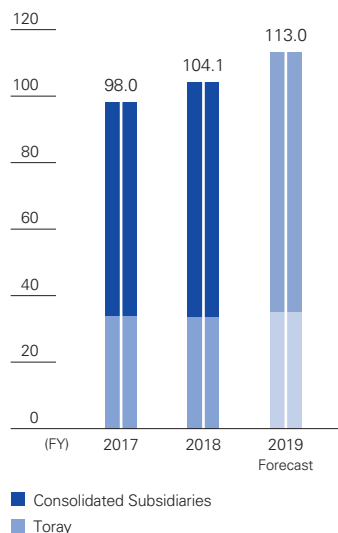
Capital Expenditures*

(Billion yen)



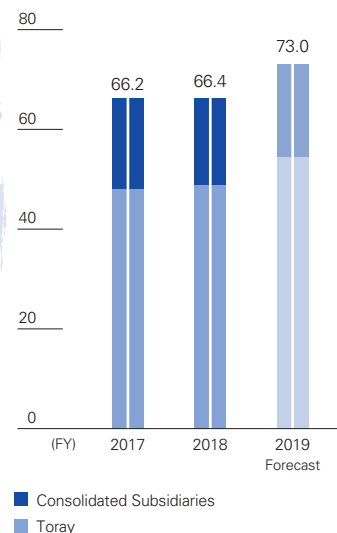
Depreciation*

(Billion yen)



R&D Expenses

(Billion yen)



* Total of tangible assets and intangible assets (excluding goodwill)

Major Capital Expenditure Projects

FY March 2019	Toray Battery Separator Film Korea Limited	Battery separator film SETELA® production facilities
	Zoltek Companies, Inc.	Large tow carbon fiber ZOLTEK™ production facilities
	Alcantara S.p.A.	Alcantara® production facilities
	Toray BSF Coating Korea Limited	Battery separator film SETELA® coating facilities
FY March 2020	Alcantara S.p.A.	Alcantara® production facilities
	Zoltek Zrt.	Large tow carbon fiber ZOLTEK™ production facilities
	Toray Plastics (Malaysia) Sdn. Berhad	ABS resin TOYOLAC® production facilities

Results by Segment for Fiscal 2018

STRATEGY

Core Growth Driving Business

Fibers & Textiles

In Japan, demand for industrial applications such as automobiles was strong in general, while shipment of apparel applications remained weak partly due to the unseasonable weather. Against this background, Toray Group not only strived to expand sales in each application but also worked to expand the business format that integrates fibers to textiles to final products while focusing on strengthening cost competitiveness.

Overseas, business performance of some subsidiaries in Southeast Asia remained slow, and was affected by a slowdown in demand for materials for automotive and other applications from the second half of the fiscal year, reflecting the deceleration of the Chinese economy. The Group expanded the integrated business for apparel applications. The segment's business both in Japan and abroad was generally affected by the increase in raw material prices.

Strategically Expanding Businesses

Performance Chemicals

In the resins business, Toray Group expanded sales of automotive applications while passing on the rise in raw material prices to the sales price, but the business was affected by the economic slowdown in China. The chemicals business saw an improvement in the basic chemicals market and sales of fine chemical products also increased. In the films business, shipment of battery separator films for lithium-ion secondary batteries increased reflecting demand growth, while polyester films and other products were broadly affected by the increase in raw material prices. The electronic & information materials business was affected by the slowing demand in the smartphone market.

Carbon Fiber Composite Materials

In the Carbon Fiber Composite Materials segment, demand for aircraft applications was mostly strong given the completion of the inventory adjustment in the supply chain. Demand for industrial applications showed a recovery trend for the most part, primarily in the environment and energy-related fields led by compressed natural gas tank applications and wind turbine blade applications. However, the segment was affected by rising raw material prices and intensifying competition. The cost of starting a new project at a composite subsidiary overseas increased and the segment also incurred fees related to the acquisition of the entire stake in TenCate Advanced Composites Holding B.V.

Intensively Developing and Expanding Businesses

Environment & Engineering

In the water treatment business, demand for reverse osmosis membranes and other products grew strongly on the whole in Japan and abroad. Among domestic subsidiaries in the segment, the trading volume of a trading subsidiary increased, while an engineering subsidiary outside Japan was affected by the conclusion of a large-scale plant construction project.

Life Science

In the pharmaceutical business, while sales volume of orally active prostacyclin derivative DORNER[®] increased in the overseas markets, the sales were affected by its generic versions and the revision of National Health Insurance drug price standards in Japan. Sales of pruritus treatment REMITCH[®]* were influenced by the market entry of its generic versions.

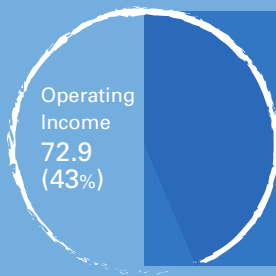
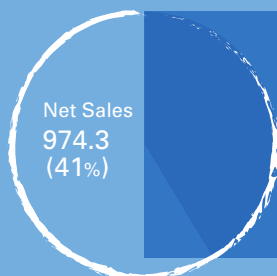
The medical devices business was affected by the reduction of the insurance reimbursement amount in Japan and the increase in raw material prices, while shipment of dialyzers grew strongly in Japan and overseas and sales volume of dialysis machines also expanded.

*REMITCH[®] is a registered trademark of Torii Pharmaceutical Co., Ltd.

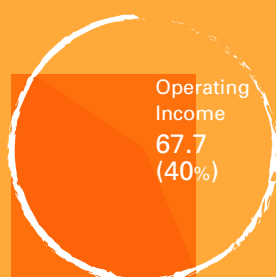
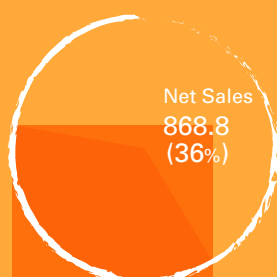
Performance (Billions of yen) Main Products

* The figures in parentheses of each segment are composition ratios by segment.

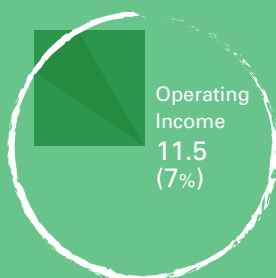
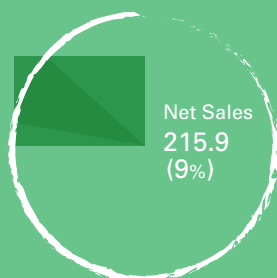
Main Products



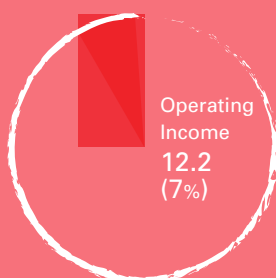
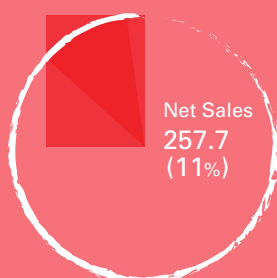
- Filament yarns, staple fibers, spun yarns, woven and knitted fabrics of nylon, polyester, acrylic, and others
- Non-woven fabrics
- Ultra-microfiber non-woven fabric with suede texture
- Apparel products, etc.



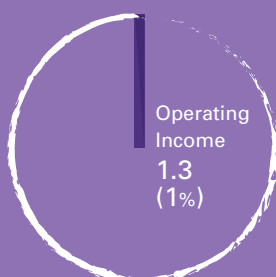
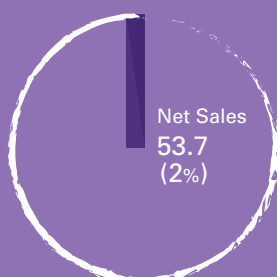
- Nylon, ABS, PBT, PPS, and other resins and molded products
- Polyolefin foam
- Polyester, polyethylene, polypropylene, and other films and processed film products
- Raw materials for synthetic fibers, and other plastics
- Fine chemicals
- Electronic and information materials and graphic materials, etc.



- Carbon fibers, carbon fiber composite materials, and molded products from those materials, etc.



- Comprehensive engineering
- Condominiums
- Industrial equipment and machinery
- IT-related equipment
- Water treatment membranes and related equipment
- Materials for housing, building, and civil engineering applications, etc.



- Pharmaceuticals
- Medical devices, etc.

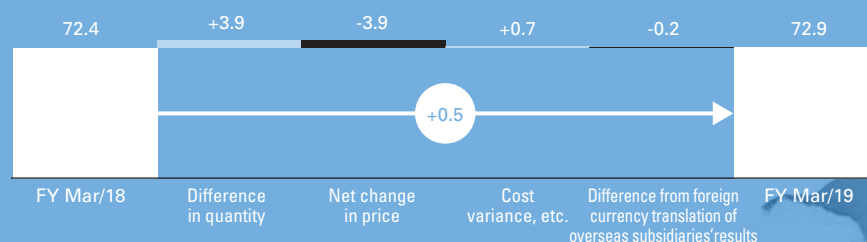
Excludes other businesses, equivalent to ¥18.5 billion (1%) in net sales and ¥3.1 billion (2%) in operating income, and adjustment of operating income of -¥27.3 billion. The composition ratio by segment of operating income is calculated excluding the adjustment amount.

Core Growth Driving Businesses

Fibers & Textiles

Years ended March 31	2017	2018	Changes	2019 Forecast
Net sales (Billion yen)	913.6	974.3	+6.6%	1,000.0
Operating income (Billion yen)	72.4	72.9	+0.6%	70.0
Operating income to net sales	7.9%	7.5%		

Changes in Operating Income (Billion yen)



Net Sales
(Billion yen)

974.3

Operating Income
(Billion yen)

72.9

Operating Income to
Net Sales

7.5%

ROA
(Operating Income/
Assets)

9.3%

Basic Policy

- Strengthen its earnings structure as a core growth driving business of Toray, and expand business in growth business fields and regions
- Aim for significant growth in the segment through the further enhancement of global operations

Earnings Opportunities and Risks

- Growing need for advanced materials contributing to the resolution for global environmental and energy/resource issues, and health and longevity
- Changes in the global economy and personal spending trends
- Improving standards of living and tighter regulations in China and emerging economies as income levels in those areas rise
- Raw materials and fuel prices trends

Basic Strategies for Achieving the Medium-term Management Program "AP-G 2019" Targets

- Maintain and reinforce domestic business foundation and processing platform in production areas, and further strengthen business competitiveness
- Reinforce business foundation of existing operations at overseas locations, and expand business in growth business fields and regions
- Strengthen Toray Group's global operations and create new business areas by developing and expanding business on multiple levels combining its strength of diverse product lines, supply chain, and global sales
 - > Aim to achieve significant growth by the global fibers/textiles/final products integrated business format and SCM, reinforce value chain of strategic products, and expand new business areas

Fiscal 2019 Outlook

- In apparel applications, anticipate 2019 autumn/winter business to be weak due to the warm winter in 2018, despite the efforts to expand sales in all applications and high value-added products
- In industrial applications, seek to expand sales by utilizing enhanced facilities such as PP spunbond, airbags, and ultra-microfiber non-woven fabric with suede texture

Topics

01

Toray completes its new TECHNORAMA GIII textile and garment development base

Toray completed the construction of its new TECHNORAMA GIII textile and garment development base, located in the Advanced Textiles Development Center at the Company's Seta Plant, in June 2018. The Advanced Textiles Development Center is Toray's headquarters for the development of high-level processing technologies, from spinning and yarn texturing to weaving, knitting, dyeing and sewing. Toray launched the TECHNORAMA weather simulation laboratory for the first time in 1983 and has continued to develop numerous highly functional products, including moisture-permeable waterproof material and functional innerwear. Toray in 2008 established TECHNORAMA GII, a large-scale weather simulation laboratory that can accommodate items such as cars, at the Toray Fibers & Textiles Research Laboratories (China) Co., Ltd. (TFRC) in China, and has continued to promote the development of highly functional textiles, industrial materials and environment-conscious materials.

The new weather simulation laboratory at TECNORAMA GIII can not only recreate a diverse range of weather conditions, including extremely low temperature and low humidity environments, as well as torrential rain, but can also allow experiments focused on sudden temperature changes in our daily lives. It also enhances evaluation and analysis technologies through physiological analysis based on human engineering, and motion analysis based on sports engineering, so that Toray can continue to work on the development of new fields. The Company has also established an Open Lab, which is a joint development base designed to improve the sophistication of products and shorten development cycles through collaboration with partners both within and outside the Company.

02

Toray launches sales of Ultrasuede® BX, an environmentally friendly non-woven material with a suede texture that has the world's highest level of plant-based raw material content

Toray has launched sales of "Ultrasuede® BX," a non-woven material with a suede texture. The material uses plant-derived polyester and polyurethane as raw materials, giving it a plant-based raw material content ratio of about 30%, the highest in the world. Ultrasuede® BX is also the world's first non-woven material with a suede texture using plant-based polyurethane as a raw material. The Company targets sales of ¥500 million from the product in fiscal 2019 and sales of ¥3 billion in fiscal 2023.

In the past, durability and texture have been key challenges for plant based polyurethane. To solve these issues, Toray used its unique design technologies in areas from original polymers to material structures, as well as its polyurethane coagulation technology to succeed in developing the Ultrasuede® BX product, which has a high plant-based raw material ratio, as well as superior feeling and functionality, including in areas such as durability, air-permeability, and maintenance.

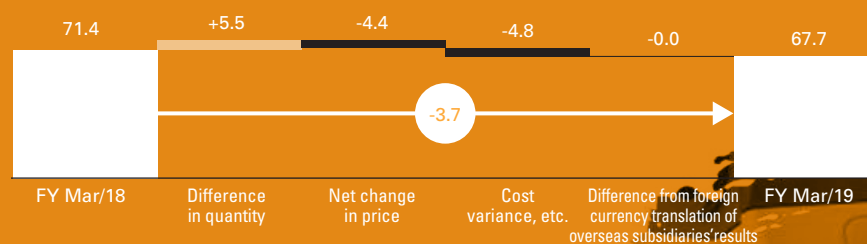
Marketed globally by Toray, Ultrasuede® is a cutting-edge non-woven material with a suede texture representing the best of Japanese quality. Toray developed the product in 1970 and through continuous technological advancements has created a highly sophisticated and functional material that can be used not only in fashion and interior design, but also in automotive and aircraft interiors, sports equipment, and accessories for smartphones and other mobile devices. Toray has also been focusing on the development of environmentally-friendly sustainable products and has been marketing "Ultrasuede® PX," which uses a plant-based polyester since 2016. The addition of Ultrasuede® BX to the brand's product lineup further expands the Company's development of non-woven materials with a suede texture that contribute to both sustainability and new creation.



Performance Chemicals

Years ended March 31	2017	2018	Changes	2019 Forecast
Net sales (Billion yen)	803.3	868.8	+8.2%	935.0
Operating income (Billion yen)	71.4	67.7	-5.1%	81.0
Operating income to net sales	8.9%	7.8%		

Changes in Operating Income (Billion yen)



Net Sales
(Billion yen)

868.8

Operating Income
(Billion yen)

67.7

Operating Income to
Net Sales

7.8%

ROA
(Operating Income/
Assets)

6.9%

Basic Policy

- Expand business by expanding sales of high value-added products in growth business fields and maximum utilization of global bases
- Strengthen earnings base by business structure reform

Earnings Opportunities and Risks

- Growing need for advanced materials contributing to the resolution of global environmental and energy/resource issues
- Changing in the demand trends of end products such as automobiles, including electric vehicles, LCD TVs and smartphones, and changes in technological trends in various components
- Raw materials price trends

Basic Strategies for Achieving the Medium-term Management Program "AP-G 2019" Targets

■ Resins, Chemicals Business

- Allocate management resources and promote business expansion in growing businesses including PPS resins, resin compounds overseas, and automotive materials

■ Films Business

- Invest in facilities for lithium-ion battery separator films and promote sales expansion through product development
- Reorganize manufacturing of PET films, increase value of existing products by utilizing global operations, and enhance sales expansion

■ Electronic & Information Materials Business

- Expand sales of OLED-related materials and accelerate technology development and commercialization of products beyond the LCD display field

Fiscal 2019 Outlook

- In resins business, will expand sales of high-functional ABS resins and engineering plastics for automotive applications, etc.
- In films business, intend to expand sales in growth business fields, including battery separator films and MLCC release films
- In electronic & information materials business, expect to increase sales of OLED-related materials and electronic circuit materials

Topics

01

Toray bolsters production capacity for ABS resin TOYOLAC® at Malaysian Subsidiary

Toray has decided to increase the production capacity for its ABS resin TOYOLAC®, which is manufactured and distributed by Toray Plastics (Malaysia) Sdn. Berhad (TPM). The Company will add a facility with annual production capacity of 75,000 tons in an effort to expand sales of high performance varieties such as transparent grade, for which the Company has the No. 1 global market share, thanks to its cost competitiveness and stable quality, which is due in large part to the Company's proprietary continuous polymerization production process. The Company aims to launch operations under the new arrangement in November 2020. The move will increase TPM's production capacity to 425,000 tons a year, and Toray Group's capacity, including the existing facility at Toray Chiba Plant, to 497,000 tons a year.

ABS resin is a plastic that is light, strong, and elegant. It shows excellent processability, and it is used for an extremely wide range of applications, from industrial items to household goods. In 2018, global demand for ABS resins was 9 million tons and is expected to grow steadily at 3% a year, as demand is expected to increase in China, the ASEAN community, and emerging countries. Global demand for high performance ABS resin such as transparent ABS, and resins with added properties such as heat resistance and chemical resistance, in 2018 is estimated at about 2.1 million tons. Amid increased demand for enhanced functionality in a wide range of applications, including home appliances, office automation, automobiles, and toys, demand for these products is expected to grow at 4% or more annually.

While the mother plant in Chiba is accelerating the shift in its product mix to focus mainly on highly functional ABS resins, including medical-use transparent ABS, the increase in production in Malaysia will accelerate the expansion of potential applications and advance the Company's entry into the European, U.S., and Indian markets, in addition to the existing mainstay Chinese and ASEAN markets.

02

Toray to increase production capacity of polypropylene film TORAYFAN® at U.S. subsidiary

Toray has decided to increase production capacity for its polypropylene film TORAYFAN®, which is manufactured by Toray Plastics (America), Inc. (TPA). A new production facility with annual capacity of 30,000 tons will be additionally built at TPA's Rhode Island plant, with the goal of starting operations in 2020. TORAYFAN® is considered the lightest of the plastic films and shows superiority in transparency, toughness, and the ability to preserve aromas. It is widely used for general industrial applications, capacitors, and packaging materials. TPA has high share in high value-added packaging materials in the North American market.

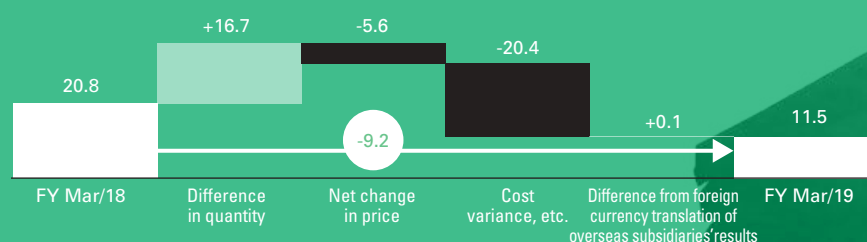
The biaxially-oriented polypropylene market in North America is expected to grow at a pace of 3% a year as the population in the region expands. In the food packaging film market in particular, there is an increasing push to extend the shelf life of food and to diversify package designs for snacks, confections, and health foods such as nutrition bars. The announced production capacity increase is in response to this kind of diversification and the growing sophistication of customer needs, and by moving quickly to expand production capacity at TPA, the Company aims to further expand its biaxially-oriented polypropylene business.

Strategically Expanding Businesses

Carbon Fiber Composite Materials

Years ended March 31	2017	2018	Changes	2019 Forecast
Net sales (Billion yen)	177.9	215.9	+21.3%	250.0
Operating income (Billion yen)	20.8	11.5	-44.4%	22.0
Operating income to net sales	11.7%	5.3%		

Changes in Operating Income (Billion yen)



Net Sales
(Billion yen)

215.9

Operating Income
(Billion yen)

11.5

Operating Income to
Net Sales

5.3%

ROA
(Operating Income/
Assets)

2.1%

Basic Policy

- Further expand the business as the world's number one manufacturer of carbon fibers

Earnings Opportunities and Risks

- Growing need for advanced materials contributing to the resolution of global environmental and energy/resource issues
- Demand trends in end products, including automobiles, compressed natural gas tanks, wind turbine blades, and aircraft
- Global supply and demand balance for carbon fiber
- Trends in raw materials and fuel prices, foreign currency exchange rates

Basic Strategies for Achieving the Medium-term Management Program "AP-G 2019" Targets

■ Aerospace Applications

- Further strengthen existing partnerships
- Capture new programs

■ Industrial Applications

- Reinforce dominant market share by leveraging comprehensive strengths in lineup of regular tow and large tow products
- Reinforce dominant market share in the wind turbine blade applications by strengthening alliance with major customers, supported by the cost competitiveness in large tow products
- Develop intermediate products/molding technologies and enhance the supply chain to meet the full-scale expansion in automotive application demand

Fiscal 2019 Outlook

- In aerospace applications, expect shipment to expand in response to the increase in production volume of our major customer
- In industrial applications, seek to expand sales primarily in the environment and energy-related fields
- Will promote cost reductions at a composite subsidiary overseas

Topics

01

Increasing production capacity for large tow carbon fiber at Zoltek Companies, Inc.

Toray has decided to increase production capacity for large tow* carbon fiber at the U.S. subsidiary Zoltek Companies, Inc. Through this facility expansion, the Company aims to increase production capacity at Zoltek's Hungarian facility from 10,000 tons to 15,000 tons annually. Total investment will exceed US\$130 million and production will start in early 2020. Zoltek has already implemented equipment enhancements and raised the capacity of their Mexican facility from 5,000 tons per year to 10,000 tons per year. Once the current enhancements at the Hungarian facility are in place, Zoltek's total annual production capacity will be approximately 25,000 tons or more.

Zoltek signed a strategic cooperation agreement with the Hungarian government in March 2015, with the company receiving strong support from the government, including in infrastructure development, employee recruitment, and employee education. The announced facility expansion has been planned in line with the content of the strategic cooperation agreement.

Demand for large tow carbon fiber for industrial applications is rapidly expanding. Demand for wind turbine blades, the main application for Zoltek's large tow carbon fiber, is expanding not only in Europe, but in South America as well as Asia, particularly China and India. Furthermore, due to the larger size of the turbines, carbon fiber usage per blade is also expected to increase.

Zoltek will continue to leverage the strengths of its production bases in the U.S., Hungary, and Mexico and follow a business model based on local production and consumption as it aims to capture the growing global demand of wind turbine blade manufacturers. Europe is taking the lead in the use of carbon fiber for automotive structural applications, and Zoltek has established a timely supply chain for the region originating from the Hungarian facility, which is currently expanding its production capacity. The company will continue to respond quickly to demand growth moving forward. Zoltek is also focused on enhancing its carbon fiber production facilities at the Hungarian and Mexican plants, and as the world's number one supplier of large tow carbon fiber remains committed to the building of a top-tier supply system.

*Large tow: carbon fiber having more than 40K filaments (40,000 fibers) that is used as a relative low-priced material and satisfies industrial application requirements, including those related to wind turbine blades and strengthening agents for resin compounds.

02

Toray acquires TenCate Advanced Composites stock

Toray purchased all outstanding shares of TenCate Advanced Composites Holdings B.V., a Dutch carbon fiber composite material manufacturer in July 2018. This company is a prepreg manufacturer with its main manufacturing bases in Europe and the U.S. and has an established track record of supplying thermoplastic prepreg and high heat resistance thermoset resin materials in a wide range of applications. Also, it is a global leader in carbon fiber intermediate materials using thermoplastic resins. The acquisition is expected to generate significant synergies by combining Toray's broad range of carbon fiber and polymer technologies with the product lineup of the newly acquired company. Moreover, by combining the two companies' distribution channels, Toray can offer a wider product lineup to its customers. Toray will continue to respond swiftly to the market expansion in small-sized aircraft and over the medium to long term to expand the business further in industrial applications, including automotive applications.

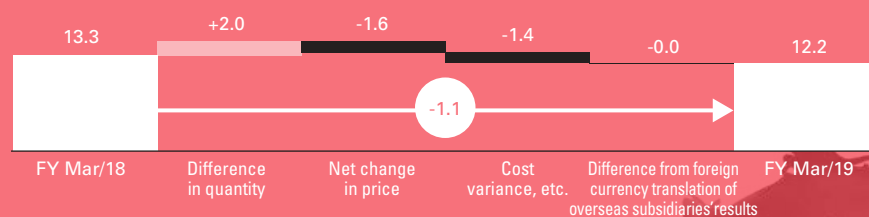


Intensively Developing and Expanding Businesses

Environment & Engineering

Years ended March 31	2017	2018	Changes	2019 Forecast
Net sales (Billion yen)	238.3	257.7	+8.1%	270.0
Operating income (Billion yen)	13.3	12.2	-7.9%	14.0
Operating income to net sales	5.6%	4.7%		

Changes in Operating Income (Billion yen)



Net Sales
(Billion yen)

257.7

Operating Income
(Billion yen)

12.2

Operating Income to
Net Sales

4.7%

ROA
(Operating Income/
Assets)

4.6%

Basic Policy

- Expand business in the environment and energy field with focus on water treatment membranes and facility design capabilities

Earnings Opportunities and Risks

- Growing need for advanced materials that can contribute to the resolution of global environmental and energy/resource issues, and related machinery to manufacture them
- Political instability in areas suffering from water shortages
- Crude oil price trends
- Capex trends at mainstay customers

Basic Strategies for Achieving the Medium-term Management Program "AP-G 2019" Targets

■ Water Treatment Business

- Expand business and strengthen competitiveness in the membrane business
- Enhance development of reverse osmosis membrane products and strengthen cost competitiveness
- Expand sales of UF membranes in China and the U.S.A.
- Strengthen the business foundation in the water treatment system and plant business

■ Engineering Business

- Expand plant business and industrial machinery (in the environment and energy fields and the life science field)
- Make use of external resources in growth areas
- Strengthen cost competitiveness
- Accelerate overseas expansion

Fiscal 2019 Outlook

- In the water treatment business, seek to expand sales of the membrane business including RO membranes to meet the growing global demand

Topics

01

Established a drinking water treatment facility production and sales company in China

Operating its water treatment business in China since the 1980's, Toray, along with ORIX Corporation (ORIX) and China Water Affairs Group Ltd. (China Water Affairs), established a joint-venture corporation (Jiangxi Yinli Drinking Water Equipment Co., Ltd.) in March 2019.

ORIX established China's first leasing company in 1981. Since then, it has utilized its experience to expand its financial and investment businesses in China. China Water Affairs is a comprehensive water treatment company listed on the Hong Kong Stock Exchange. In addition to the operation and management of water supply and sewage facilities in regional cities across China, the Chinese firm also handles peripheral projects including infrastructure and maintenance.

China, in recent years, has seen an increase in demand for water suitable for drinking straight from the tap. With this in mind, the three companies concluded a strategic partnership, and through the establishment of the joint venture will incorporate Toray's membrane filtration technologies to manufacture and sell drinking water treatment facilities that are capable of supplying water that is suitable for drinking directly from the source.

After obtaining water products production and sales license from the Chinese government, the joint venture intends to utilize China Water Affairs' expertise and networks in the water business in China to install facilities in public buildings such as schools and hospitals, as well as private buildings such as hotels, offices, and apartments.

02

Establishing a joint-venture company in the Republic of Korea to expand the air filter business

Toray established M&T Engineering Co., Ltd (M&TE) in the Republic of Korea as a joint venture company with MCM Co., Ltd. (MCM), a company under the Chung Ho Nais Group, which is engaged in the sales of water purifiers and air cleaners. M&TE commenced operations in October 2018. The company is capitalized at 6 billion won (about ¥600 million), with MCM having a 60% stake and Toray having a 40% stake. M&TE combines the assembling and processing, as well as automation expertise of MCM with Toray integrated design and development technology, starting from fibers and filter materials to assembled units, so as to build a local production setup for the high-performance filters necessary to expand the company's business in the Republic of Korea as well as to supply to Korean manufacturers with a global presence. The Chung Ho Nais Group has a strong share of the Korean water purifier market, and has a broad business base, with sales to major global players in the country and exports to some 60 countries.

Toray has been producing non-woven fabric for air filters since 2012 at Toray Fibers (Nantong) Co., Ltd. (TFNL), its fiber production base in China. This has allowed the Company to build a local production and supply structure adapted to the Chinese GB standards* and contribute to measures aimed at reducing atmospheric pollution, which has become a serious social issue. M&TE will assemble filters that use TFNL's non-woven fabric for high-performance filters, thus accelerating the sales expansion in the country, as well as around the world, by directly supplying major home electronics and automobile manufacturers.

*Chinese GB standards: Chinese national standards related to initial performance and performance throughout the life of air purifiers.

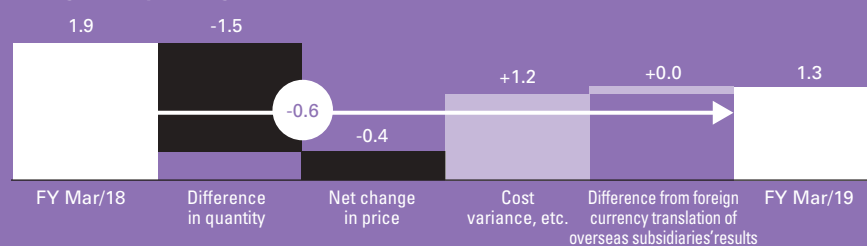


Intensively Developing and Expanding Businesses

Life Science

Years ended March 31	2017	2018	Changes	2019 Forecast
Net sales (Billion yen)	53.8	53.7	-0.3%	55.0
Operating income (Billion yen)	1.9	1.3	-33.0%	0
Operating income to net sales	3.6%	2.4%		

Changes in Operating Income (Billion yen)



Net Sales
(Billion yen)

53.7

Operating Income
(Billion yen)

1.3

Operating Income to
Net Sales

2.4%

ROA
(Operating Income/
Assets)

1.7%

Basic Policy

- Maintain and expand domestic market share, accelerate and strengthen overseas development
- Use selection and concentration to promote more efficient product development

Earnings Opportunities and Risks

- Growing need for advanced materials to improve quality of healthcare, ease burden on medical professionals, and contribute to health and longevity
- Japanese government's promotion of generic products and ongoing revision of National Health Insurance drug price standards as well as reduction of the insurance reimbursement prices
- Laws and regulations trends in each country

Basic Strategies for Achieving the Medium-term Management Program "AP-G 2019" Targets

■ Pharmaceutical Business

- Maintain the domestic market share and develop overseas markets of oral antipruritus drug REMITCH®*
- Create next-generation drugs using new processes

■ Medical Devices Business

- Expand sales of dialyzer products in Japan and overseas
- Expand domestic sales and accelerate overseas development in critical care and cardiovascular products
- Quickly commercialize bio-devices

Fiscal 2019 Outlook

- In pharmaceuticals, anticipate pruritus treatment REMITCH®* to be affected by its generic versions
- In the medical devices business, will expand sales of our dialysis-related products, but expect price competition to intensify and demand for some products to decrease

*REMITCH® is a registered trademark of Torii Pharmaceutical Co., Ltd.

Topics

01

Exclusive license agreement for Antipruritic Agent TRK-820 in Thailand and Indonesia

Toray and Meiji Seika Pharma Co., Ltd. (Meiji) signed an exclusive license agreement on the orally disintegrating (OD) tablets formulation for the antipruritic drug TRK-820 developed by Toray. Pursuant to the agreement, Meiji gains the exclusive rights to develop and commercialize the product in Thailand and Indonesia. In return, Meiji will pay an initial payment as well as milestone payments in line with development progress to Toray.

TRK-820 is marketed as REMITCH®*1 Capsule 2.5µg and REMITCH® OD Tablet 2.5µg in Japan to improve pruritus in hemodialysis patients and patients with chronic liver disease (used only when sufficient efficacy is not obtained with the existing therapies or treatments). In particular, the REMITCH® OD Tablet can be administered both with and without water and is expected to contribute to improved medication compliance*2 for patients with a deteriorated swallowing function, which would include some senior citizens and those with limited water intake abilities.

Meiji has consolidated pharmaceutical manufacturing subsidiaries in Thailand and Indonesia. Thailand in particular has a large number of end-stage renal disease patients and it is one of the countries where there is a strong need for hemodialysis treatment. Toray and Meiji expect to make a significant contribution to easing pruritus in dialysis and chronic liver disease patients in Thailand and Indonesia who have until now not had access to effective treatment.

*1 REMITCH®: The world's first highly selective K(kappa)-opioid receptor agonist developed by Toray. REMITCH® is a registered trademark of Torii Pharmaceutical Co., Ltd.

*2 Medication compliance: The act of taking medication on schedule and taking medication as prescribed.

02

Nucleic acid drug TRK-250 receives orphan drug designation from the U.S. FDA

TRK-250 is a nucleic acid drug for the treatment of Idiopathic Pulmonary Fibrosis (IPF), originated by BONAC Corporation (BONAC) and currently undergoing a Phase I clinical trial in the U.S. with IPF patients by Toray. BONAC received an Orphan Drug Designation from the U.S. Food and Drug Administration (FDA) for TRK-250 in February 2019. The orphan drug designation enables benefits such as 7-year marketing exclusivity, tax credits for clinical trials costs, and a partial waiver on marketing application costs in the U.S.

IPF is a disorder with a poor prognosis and an unpredictable clinical course, in which fibrosis of intestinal pneumonia progresses irreversibly. Thus, the development of a novel drug with new mechanisms is expected to broaden the treatment options in clinical practice.

TRK-250 inhibits the progression of pulmonary fibrosis by selectively suppressing the expression of transforming growth factor-beta 1 (TGF-β1) protein, a key growth factor involved in lung fibrosis, at the gene expression level. One of the features of the agent is that it is a single strand long-chain nucleic acid with a unique molecular structure employing BONAC's proprietary nucleic acid platform. The treatment is expected to overcome the issue of stability, a common problem in conventional nucleic acid treatments. Moreover, it comes in an aerosol form that can be administered directly to the lung, which is expected to carry the agent efficiently to the target organ.

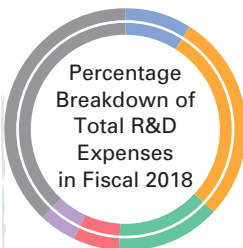
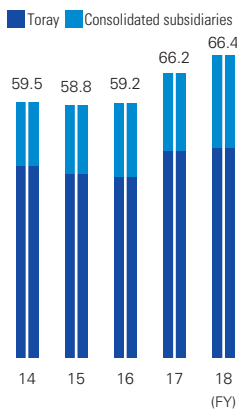
With TRK-250's orphan status in hand, Toray and BONAC are focused on further accelerating the development of TRK-250, and aim to market the treatment in the late 2020s.

R&D

Fiscal 2018
R&D Expenses

¥66.4 billion

R&D Expenses
(Billion yen)



Fibers & Textiles business

9%

Performance Chemicals business

28%

Carbon Fiber Composite Materials business

14%

Environment & Engineering business

6%

Life Science business

5%

Corporate R&D

38%

Fiscal 2018 R&D Achievements

Fibers & Textiles

Using our innovative composite spinning technology, we have developed Primeflex[®], a material composed of two-component, bimetal thread that has the smallest diameter in the world at 0.8dtex. In addition, we have developed Deep Color Nylon[™], a UV-blocking nylon textile that features deep, vivid colors, superior color fastness, and is composed of a fiber structure with minimal amorphous components, which cause colors to fade. We have also developed "Ultrasuede[®] BX," an ultra-microfiber non-woven fabric with suede texture that is about 30% made of plant-based raw materials, realizing the highest proportion of plant-based raw materials—Polyester and Polyurethane—in the world.

Performance Chemicals

Using our proprietary precise control alloy technology, we have developed a new polyphenylene sulfide (PPS) resin that boasts the world's highest level of flexibility while featuring strong thermal and chemical resistance. We have also developed a solar control film that possesses one of the world's highest levels of heat reflection properties with respect to infrared radiation from the sun. This film also further deepens our nano-layering technology while maintaining glass-like transparency. In addition, we developed the world's first waterless offset printing equipment that does not use VOCs and capable of reducing power consumption by around 80% compared with conventional printing methods.

Carbon Fiber Composite Materials

We have developed the TORAYCA[®] MX series, a new carbon fiber that improves tensile strength by around 30% while retaining the equivalent tensile modulus to conventional carbon fibers through the application of technology to improve the orientation by closely controlling the graphite crystal structure in a nano order. We also have developed prepreg (resin-impregnated carbon-fiber sheets) for primary structural components of aircraft that applies new molding technology without using autoclaves that was developed in the previous fiscal year.

Environment & Engineering

We have developed technology that limits the resistance of the feed water and purified water flowing through the reverse osmosis (RO) membrane to the minimum, thus boosting the velocity of flow of feed water. Consequently, we have succeeded in improving water recovery by as much as twice. In addition, we have successfully created a polyvinylidene fluoride (PVDF) ultrafiltration (UF) membrane that further deepens pore diameter control technology, effectively separates micro substances, and features a high level of water permeability.

Life Science

We have created a new fibrous adsorbent for purifying blood that applies synthetic fiber spinning technology to selectively eliminate bio targets such as cells and proteins. In addition, we are accelerating the development of TRK-950 antibody drug currently undergoing Phase 1 clinical testing with the aim of gaining approval early as a cancer treatment. We have also begun a Phase 1 clinical trial in the United States for TRK-250, a nucleic acid drug jointly developed with BONAC Corporation. TRK-250 was granted an Orphan Drug Designation by the U.S. Food and Drug Administration (FDA) for the treatment of idiopathic pulmonary fibrosis.

Fiscal 2018 Topics

Toray Creates Innovative UV Blocking Film by Deepening Nano-multilayer Technology

The use of OLED displays has been spreading rapidly. However, according to some reports, such displays have been found to be sensitive to UV damage, even in the 400 nm range, close to visible light, leading to calls for further improvements in durability. Given this, Toray successfully developed an innovative UV blocking film that, while being thin, blocks 99.99% of UV rays, maintains transparency, and is capable of cutting UV up to around the 400 nm range. The new product, "PICASUS[®]UV" is a laminated film comprised of several hundreds to thousands of nano-scale layers, representing a greater depth of our proprietary technology that works to individually design the thickness and layout of these layers, and to precisely control the wavelength bands of reflection and transmission. Toray aims to mass produce this film from 2020, and going beyond displays, anticipates various other applications for automobile, building and construction material, agriculture, electronic material, and special packaging in the pharmaceutical and other fields.

Development and Commercialization of High-performance Positive Photosensitive Siloxane Coatings Recognized with the CSJ Award for Technical Development

Toray has been honored with the 67th (2018) CSJ Award for Technical Development by the Chemical Society of Japan. The award recognizes this innovative technology for its realization of high degrees of resolution and sensitivity with the positive-tone photosensitive properties of siloxane, a hybrid organic and inorganic material that offers exceptional transparency and heat resistance. The award also highly evaluated the technology for its high degrees of design and property freedom with, such as refraction index control and calcined silicates, which can lead to significant contributions to higher performance of displays, touch sensors, image sensors and other optical devices.

Successful Execution of National Project with Toray DNA Chip

Toray has developed its DNA Chip "3D-Gene[®]" that is 100 times more sensitive than conventional products. And based on this technology, Toray enabled the super sensitive detection of microRNA in blood. Until fiscal 2018, Toray has been promoting a large-scale national project with the National Cancer Center, the representative cancer research and clinical center of Japan, and other organizations. As a result, Toray carried out a study involving 1,000 cases, using serum samples from, such as breast cancer or colon cancer patients, and good results were obtained. Deepening the cooperation with related organizations, Toray will continue to concentrate all power and aim at the early application for marketing authorization and its approval.

Intellectual Property



Basic Policies on Intellectual Property

Toray Group has formulated and executes the following four intellectual property strategies as its basic policies on intellectual property.

1 Intellectual property strategies, as a part of the strategy trinity, that conform to management principles

Toray Group regards intellectual property as one of its vital management resources. We integrate our intellectual property strategies mutually and organically with our business strategies and R&D strategies, and as part of this “trinity,” we designate intellectual property strategies as one of the most important elements of our management strategies.

2 Promoting the procurement of rights

In order to protect Toray Group’s products and technologies and to ensure profits in terms of intellectual property, we hold as many useful patent rights as possible and build patent portfolios. At the same time, we pay close attention to efficient patenting by raising the quality of each patent and not making needless applications.

3 Respecting the rights of others

Toray has operated a system for comprehensively investigating the relations between its own products and technologies and patents owned by other companies, and we thoroughly educate employees to prevent infringement on patent rights of other parties.

4 Rightful enforcement of our own rights

When Toray Group’s patent rights are infringed upon by another party, we take proper steps depending on the circumstances by exercising our patent rights, such as demanding that infringement cease, receiving monetary profits from licensing, and using our patent rights for cross-licensing with the patent rights of other parties.

Intellectual Property Strategies in Line with Our Management Strategies

1 Promoting global intellectual property strategies of Toray Group

We will promote Toray’s patent applications and patenting in countries other than Japan, particularly in those growth countries and regions where we aim to achieve business expansion in the future. Together with this, we will support global business growth by working to strengthen patent applications and patenting from overseas subsidiaries and affiliated companies to ensure the appropriate protection of inventions created in our bases in each country. We will also establish Group-wide intellectual property strategies that bind Toray Group’s research and technology development for each business field. In addition, we will establish and strengthen patent and trademark management systems at each company in Toray Group.

2 Firmly maintaining our technological advantage through strategic patent applications and other such efforts and rolling them out at subsidiaries and affiliated companies in Japan and overseas

At Toray Group, we are working to build patent portfolios with emphasis on the “Green Innovation Business Expansion (GR) Project” and “Life Innovation Business Expansion (LI) Project” while avoiding careless disclosure of technical information through the publication of patent applications. We expect these initiatives to support our businesses in the growth fields as a powerful barrier against entry in the future. We will also spread these efforts to our subsidiaries and affiliated companies in Japan and overseas.

3 Executing intellectual property strategies that are organically linked to our business

In order to promote the execution of intellectual property strategies linked to our individual business activities, Toray Group will strengthen participation in the patent activities of business divisions, and together with this, will work on intellectual property education according to the needs of the individual business divisions.

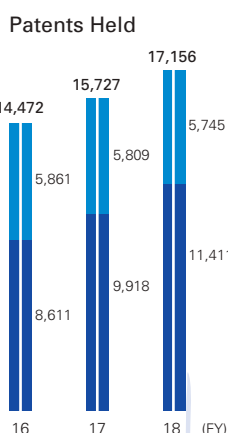
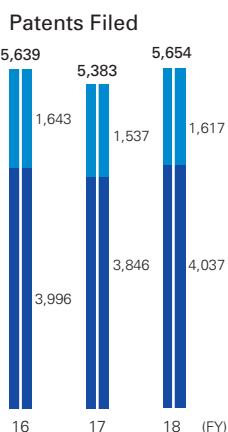
4 Strengthening utilization of our brand and trademarks

Together with our aim to enhance the value of our technology through technology brands, we will deal strictly with imitation products and other infringements of Toray Group’s trademarks amid surging growth in the number of online transactions.

5 Developing human resources to support global intellectual property activities

Toray carries out multifaceted and multilevel education for everyone from management to new employees and front-line sales representatives, covering domestic and overseas patent systems and practice. Additionally, at the Intellectual Property Division, together with encouraging the acquisition of patent attorney qualification, we actively support staff in their efforts to strengthen their foreign language capabilities and dispatch staff to overseas subsidiaries and affiliated companies.

We are also making concerted efforts to provide the same kind of intellectual property education at subsidiaries and affiliated companies in and outside of Japan. Moreover, we will assign intellectual property specialists to companies actively engaging in R&D and work to improve education for researchers and engineers.



■ Domestic
■ Overseas

Toray Selected as One of the 2018-2019 Top 100 Global Innovators

Analyzing trends in intellectual property based on proprietary data, Clarivate Analytics, based in the U.S., selects and celebrates the world’s 100 most innovative companies and institutions. This is the third time that Toray has been selected for the list, following 2015 and 2017.

Risk Management

Under normal conditions, Toray Group focuses on mitigating risks and preventing crises from occurring. In the event of a crisis, the Group strives to prevent damage from spreading by controlling and normalizing the situation quickly with a prompt and appropriate response.

Risk Management Concept

Toray Group periodically identifies potential risks in its management activities to mitigate risks and prevent crises. The Group has also established an Emergency Quick Response System for the event of major emergencies, through which it takes a prompt, appropriate measures in order to prevent damage from spreading, control and normalize the situation quickly.

Risk Management Framework

The risks surrounding Toray Group continue to change, meaning that the Group now faces the urgent issues, which are addressing risks that rapidly materialize from changes in the surrounding environment, and strengthening the frameworks for more rapid response. As part of its management strategy, Toray established a dedicated organization in April 2018 that promotes risk management and closely communicates with the top management and the Board of Directors. Toray has also defined the procedures for risk management during normal times and the quick response procedures during the occurrence of crisis within the Crisis Management Regulations, for which this dedicated organization provides overall management.

Establishment of the Risk Management Committee

Risk Management System (After June 2019)



In May 2018, Toray established the Risk Management Committee as an organization that deliberates, consults, and provides information for the purpose of promoting risk management throughout Toray Group. The General Manager of the Corporate Strategic Planning Division (Executive Vice President and Representative Member of the Board) serves as chairperson. This Committee's primary activities include priority risk mitigation as part of periodic risk management. In addition, the Overseas Crisis Management Committee and Local Crisis Management Committees, which are in charge of managing overseas travel for employees and collecting overseas risk information during normal times, have also been placed under this Committee.

Risk Management Initiative Status

(1) Periodic Risk Management (Priority Risk Mitigation Activities)

Toray Group comprehensively determines company-wide risks (climate change, natural disasters, legal violations, scandals, etc.) and identifies key risks upon implementing a comparative assessment of the importance of each risk item. Ultimately, the opinion of the Risk Management Committee, for which General Manager of the Corporate Strategic Planning Division manager (Executive Vice President and Representative Member of the Board) serves as chairperson, is sought before determining the priority risks.

In terms of the priority risks, Toray promotes activities to reduce risks through a three-year PDCA cycle. During the fourth priority risk mitigation cycle, which covers the three-year activity period starting in fiscal 2018 (2018-2020), Toray is deploying these activities throughout the entire Group, including all Group companies in and outside of Japan. For this period, the priority risks include quality management, earthquake measures, information management, and CSR procurement, among others.

Group-wide activities include selecting the divisions and departments responsible for addressing each risk, establishing a road map for outlining the three-year risk mitigation activity plan, and creating annual activity plans. In addition, each year Toray reports on the annual activity performance for the entire Group at the Risk Management Committee and follows-up on the progress status. When formulating the annual action plan for the following fiscal year, the results of this follow-up work and response to risks that

have newly emerged from changes in the environment are discussed and are taken into account.

**(2) Continuous Risk Management
(Observing trends in Japan and abroad, detecting, assessing, and monitoring risks)**

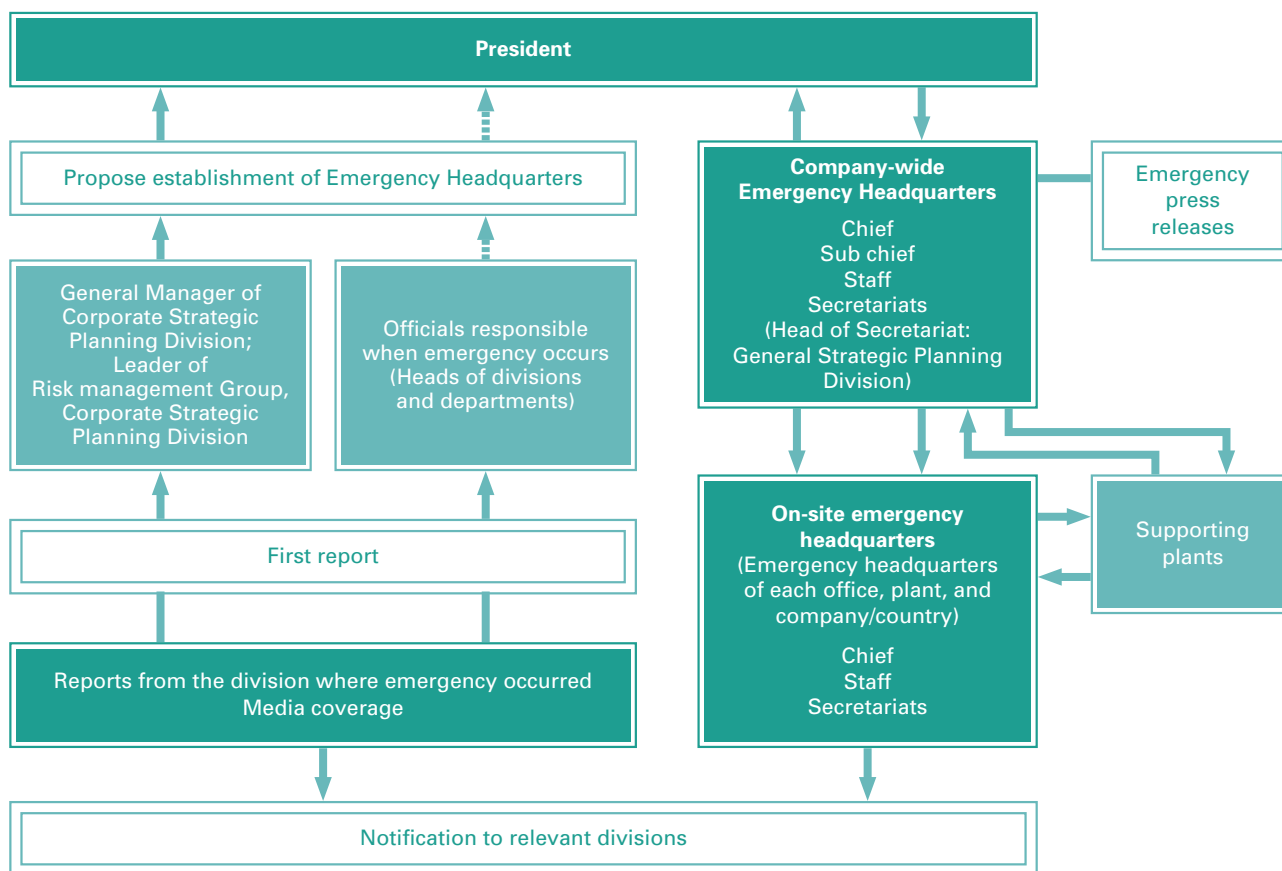
Toray vigilantly maintains an eye on trends in Japan and around the world in order to detect risks which may give a significant impact on the management of Toray Group. When a relevant risk is detected, for example trade friction between the U.S. and China, plastic pollution in the world's

oceans, and GDPR, Toray establishes a company-wide system without delay and implements the necessary measures throughout the Group.

(3) Response in the Event of a Crisis

Toray Group has established fundamental principles that form the basis of a company-wide response in the event of a major crisis within the Crisis Management Regulations. In the event of a crisis that necessitates a Company-wide response, Toray responds by setting up a Group-wide quick response system (Group-wide headquarters).

Emergency Quick Response System



Risk Management

Business Risks

Operational and other risks faced by Toray Group that could have a major influence on the decisions of investors are described below. Toray Group works constantly to avoid such potential risks, minimize their impact, and build a system to enable swift responses and accurate information disclosure on the occurrence of unforeseen situations.

Please note that the risks described below are not all of those identified by Toray Group, and do not represent all the operational and other risks that could affect Toray Group.

- Domestic and overseas demand and product market trends
- Rising prices of fuel and raw materials
- Capital expenditures, joint ventures, alliances and acquisitions, etc.
- Fluctuations in foreign currency, interest rate, and the securities market
- Changes in assumptions on which forecasts are based that might affect employee retirement benefit obligations and deferred tax assets
- Overseas operations
- Product liability
- Lawsuits
- Laws and regulations, taxes, competition policies, and internal controls
- Natural disasters and accidents
- Information security risks

Addressing Fluctuations in Exchange Rates

Foreign currency exchange rate fluctuations affect Toray Group's consolidated financial statements when the financial statements of the overseas operations presented in local currencies are translated into yen. Toray Group takes measures, such as entering forward exchange contracts, to alleviate risks associated with transactions denominated in foreign currencies. However, unforeseen exchange rate fluctuations could have an impact on Toray Group's results of operations and financial conditions.

In response to currency rate fluctuations, Toray Group utilizes its strength of maintaining business bases throughout the world while encouraging local production for local consumption. At the same time, by flexibly carrying out global operations, Toray Group is striving to build a management structure that is well-shielded from the impact of exchange rate fluctuations. Moreover, Toray Group works to gather information regarding currency movements in each country (region), while at the same time monitoring the exchange rate exposure of Group companies and their hedge position as part of its efforts to mitigate currency exchange risk.

Addressing Risks Related to Overseas Operations

Toray Group is developing a broad geographical presence, with operations in various countries of Asia, Europe and the United States. Some of the major potential risks associated with various regions are summarized below. If such risks were to become reality, Toray Group's results of operations and financial conditions could be negatively affected.

- (1) Unforeseen introduction, changes or abolition of laws and regulations, such as changes in taxation systems and tariffs which affect adversely
- (2) Unforeseen, disadvantageous economic or political events
- (3) Social upheaval, including acts of terror or war

When making decisions regarding investments related to the overseas operations, Toray Group collectively considers and carefully investigates the investment country (region) in terms of the current and long-term outlook for the political, economic, and social climate, the organizational status of the legal system, and the development status of the regional economic sphere. During the investment execution period, Toray Group also references the execution plan (progress schedule), which integrates the local political, economic, security, and legal system related risk items,

that was formulated when the investment decision was made, and makes periodic follow-ups regarding the progress status of the project. Moreover, once the investment project is completed, the latest information for each region is acquired and information related to country risk, including safety issues, is shared throughout the Group.

Addressing Major Earthquakes

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

Toray Group has established a basic policy for ensuring business continuity in the event of a major earthquake. Namely, Toray Group prioritizes the safety of its employees and preventing any impact on the local community, strives to prevent the further spread of damage and the event of secondary disasters, continues to supply key products and works toward a rapid recovery of business operations, and fulfills its social responsibility to continue supplying products. As part of this process, Toray Group continues to conduct evacuation drills in the event of an earthquake, make systematic quake-resistant upgrades to plant buildings, and draft BCPs.

In fiscal 2018, Toray Group created and began implementing BCPs for key products selected from each business in accordance with the procedures for developing BCPs for designated priority products in an earthquake. As with Toray itself, Toray Group began selecting key products and formulating BCPs for Group companies in Japan. In addition, Toray Group has conducted drills to establish a temporary Group-wide headquarters based on a scenario involving a large-scale earthquake every year since fiscal 2012. As a result of its preparations during normal times, Toray Group was able to promptly establish a Group-wide headquarters and confirm the safety of its employees following the earthquake that occurred in the northern part of Osaka in June 2018. Moreover, Toray Group was able to utilize the Toray Disaster Map System (a system for rapidly and accurately mapping the extent of damage based on location data for business partners and Toray Group), introduced following the Great East Japan Earthquake, to rapidly confirm the status of the supply chain. Going forward, Toray Group will continue to enhance its ability to respond in the event of an earthquake through such drills.

Addressing Information Security Related Risks

Toray Group's information systems and networks are fundamentally essential elements in the execution of the Group's business operations and every security precaution is taken in their development and operation. However, if such an incident as a work stoppage, a loss of trust in the Group, and a leak of confidential information were caused by unauthorized access, data alteration, theft or deletion, an interruption of system operations, or any other information security threats, Toray Group's earnings and financial conditions could be negatively affected.

Toray Group formulated its internal rules to appropriately manage technical information and other confidential information held by the Group, improved its information management frameworks, and established methods for handling information depending on the level of confidentiality. When a security-related incident occurs, the Information Security Officer follows the rules and cooperates with related divisions and departments and also employs outside experts to promptly address the issue.

In terms of information security for Group companies in and outside of Japan, Toray Group aims to enhance the level of information security throughout the Group in consideration of the increased threat of cyber attacks. The Group has begun providing information security audits for each Group company in and outside of Japan, and plans to conduct such audits once every three years. Moreover, each Group company is prohibited from destroying or falsifying information, leaking confidential information, and using information in an unauthorized manner. Toray Group has also defined the information management frameworks, roles, and responsibilities for each Group company, and educates all employees in regard to these. Moreover, Toray Group analyzes risk based on incident cases and external trends, and informs each Group company of the required measures through Group-wide management policies. Toray Group also confirms and follows-up on the response status of each Group company through annual reports.

Environmental Management Initiatives

Promoting Life Cycle Management for the Environment

In addressing global environmental issues, Toray Group has long believed it vital to focus not only on reducing greenhouse gas emissions as a result of the Company's manufacturing activities, but also considering the entire life cycle of products and services to reduce environmental impact, while also delivering improved economic and social value. With this in mind, Toray Group practices life cycle management (LCM), with a focus on reducing CO₂ emissions throughout a product or service's entire life cycle.

For Toray Group, LCM targets a reduction in greenhouse gas emissions (Avoided Emissions*) throughout the global supply chain through an expansion in the environmentally-friendly products (GR products) business. The idea of LCM is being actively adopted by industry in Japan and chemical sector companies throughout the world.

*Avoided Emissions refers to the amount of greenhouse gas emissions expected to be reduced as a result of an older product or service being replaced by a newer product or service developed by the Company.

Toray announces its Support for the TCFD Recommendations and Joins the TCFD Consortium of Japan

Toray, in May 2019, announced its support for the Recommendations*¹ of the Task Force on Climate-related Financial Disclosures (TCFD), as well as the company's participation in the TCFD Consortium of Japan*² that was launched in the same month.

In regard to contributing to solutions to the issue of climate change, Toray believes achieving environmental impact reductions alongside sustainable growth requires a clear understanding, gained through LCM, of the CO₂ balance for a product or service throughout its entire lifecycle. With this in mind, the company has been working to reduce greenhouse gas emissions throughout the value chain, with one example being the use of carbon fiber to reduce the weight of aircrafts, Toray Group has also been promoting the expansion of its Green Innovation business through investment with a long-term perspective of management resources in research and development targeting the practical use of new non-fossil resources, including bio resources.

Toray Group will actively promote the disclosure of information in line with the TCFD Recommendations, communicating to the world its active commitment to contributing toward solutions to the issue of climate change before all others.

*1 TCFD recommendations: Final report released by the TCFD in June 2017 for the purpose of supporting companies with the disclosure of information on climate-related risks and opportunities and stabilizing financial markets through a smooth transition to a low-carbon society.

*2 TCFD Consortium of Japan: A group of companies and financial institutions that supports the TCFD recommendations, the consortium of Japan was established to discuss effective corporate information disclosure and initiatives to link disclosed information to appropriate investment decisions on the part of financial institutions and other organizations.

Progress on the Fifth Medium-Term Environmental Plan

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.

Initiatives to Curb Global Warming

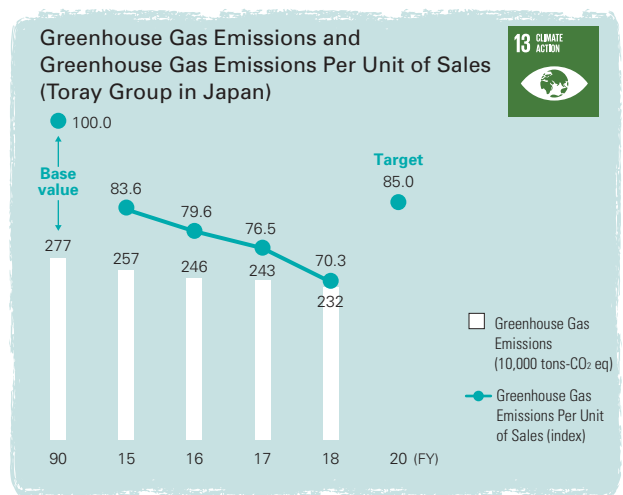
Toray has set its goal for the reduction of greenhouse gas emissions as "Reducing emissions more than 15% below the fiscal 1990 level and maintaining that level until fiscal 2020" and implements planned reduction measures. CO₂ emissions in fiscal 2018 decreased by 74,000 tons from the previous fiscal year's level due to higher production in line with business expansion. Greenhouse gas emissions rose 3.8%, to 1.95 million tons from the previous fiscal year, although this was a reduction of 23.2% from the fiscal 1990 level, continuing to meet its reduction target.

Toray and its Group companies in Japan work to curb global warming with the goal of reducing greenhouse gas emissions by 15% on a per-unit-of-sales basis by fiscal 2020, compared to the fiscal 1990 level. Toray and its Group companies' emissions of greenhouse gas were down 4.3% in fiscal 2018 compared to the previous fiscal year. Greenhouse gas emissions per unit of sales improved 6.2 points compared to the previous fiscal year and were 29.7% below the base year.

Fiscal 2018 greenhouse gas emissions for Toray Group worldwide were 5.63 million tons-CO₂ equivalent, a decline of 2.9% compared to the previous fiscal year. All Toray Group manufacturing companies and plants will work to achieve the Group's goal of reducing the per-unit energy consumption rate by 2% each fiscal year and strive to reduce greenhouse gas emissions throughout the Group.

Energy Conservation Measures

Toray Group is actively engaged in energy conservation activities in line with its goal of reducing the per-unit energy consumption rate* by 2% annually. In fiscal 2018, energy consumption declined by 4.7% compared to the previous fiscal year, largely due to a decline in production. However, the per-unit energy consumption rate deteriorated 2.1% compared to the previous fiscal year. Nevertheless, per-unit energy



consumption was still 16.8% lower than in the base year.

* Energy consumption per converted unit of production volume

Voluntary Initiatives to Reduce Atmospheric Emissions of Chemical Substances

As a corporate group that does business in the chemicals sector, Toray Group places the highest priority on reducing emissions of chemicals into the atmosphere in order to reduce its environmental impact.

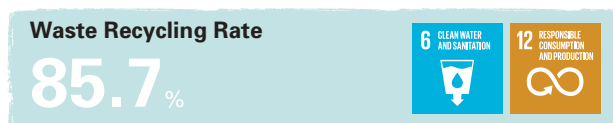
In fiscal 2018, Toray Group's atmospheric emissions of PRTR Law-specified substances were 886 tons, which represented a 66% reduction compared to the base year of fiscal 2000. VOC atmospheric emissions amounted to 1,129 tons, a 72% reduction compared to fiscal 2000. The Group has reached its target in terms of VOC atmospheric emissions.

Initiatives for Managing Water Resources

Toray Group has always been working through its water treatment business to provide solutions to water resource problems around the world. Toray Group practices the 3Rs (reduce, reuse, recycle) in consuming water resources, and monitors the quality of water that is released into public waters, additionally, at overseas-based Group companies located in drought-stricken regions in particular, we conduct recycling of cooling and effluent water and also work to reduce the volume of water used for industrial purposes.

In fiscal 2018, Toray Group used 230 million tons of water, 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 2018 stood at 51.0 points, an improvement of 3.0 points from the previous fiscal year.

Initiatives to Reduce Waste



Toray Group is carrying out zero emission initiatives as it

works toward the realization of a sustainable, recycling-based world. Under the Fifth Medium-Term Environmental Plan, the Group worked to achieve its fiscal 2020 targets for rates of simply disposed waste*¹, landfill waste*² and recycled waste*³, 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)

Initiatives to Prevent Air and Water Pollution

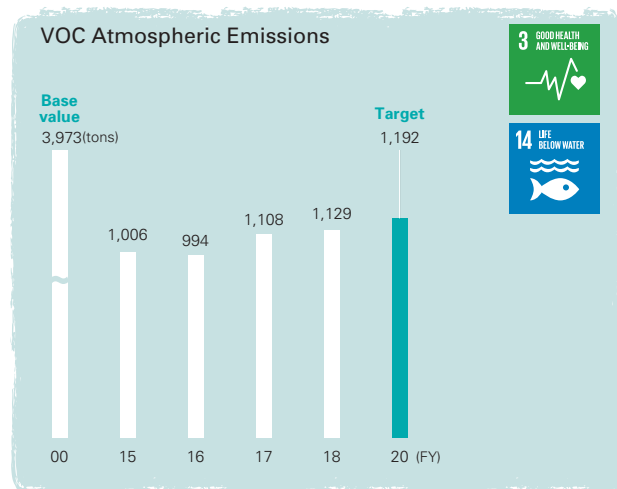
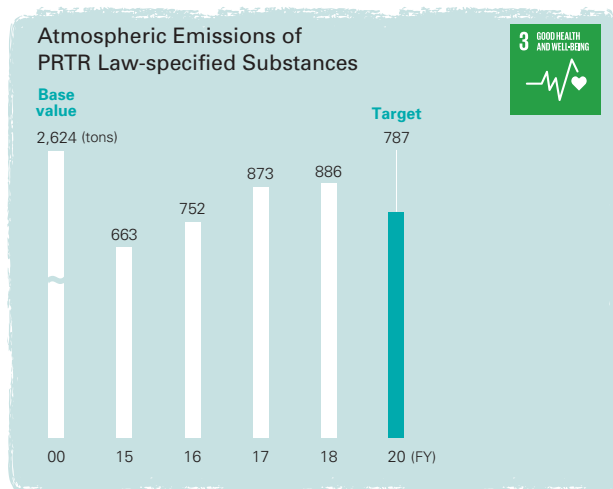
Toray Group implements ongoing initiatives at plants to reduce sulfur oxide (SOx) emissions by installing desulfurization equipment and switching to cleaner fuels, and reduce chemical oxygen demand (COD) by expanding wastewater treatment facilities.

Biodiversity Initiatives

Toray Group has positioned biodiversity, along with reducing greenhouse gas emissions, as an important theme regarding global environmental problems, and pursues biodiversity initiatives in accordance with a three-year action road map and sets its priorities based on the Group's Biodiversity Initiatives. Plants at Toray and Group companies in Japan operate greenery policies and plans through around 2020, guided by Toray Group Basic Policy for Increasing Green Areas*¹. The plans encompass initiatives to conserve green areas as much as possible, including healthy natural forests*², that have been protected since the plants began operating. These sustainable greenery conservation initiatives also help to conserve the environment for communities.

*¹ Natural groves or forestation by species based on potential native vegetation

*² Toray Group Basic Policy on Increasing Green Areas was established in 2012, evolving out of greenery policies that were first established in 1973.



Human Resources Management



Committed to Human Rights

We at Toray Group believe 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. Based on this principle, in December 2017 we formulated Toray Group Policy for Human Rights. The Group also 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 characteristics, is strictly forbidden in every process from recruiting and hiring to work placement, treatment, training, and retirement.

Since fiscal 2014, the Group has also been tackling the issue of discrimination based on gender identification and sexual orientation. In January 2017, the Group established a dedicated hotline for LGBT (sexual minority) issues, Nijiirō Consultation Service.

Toray Group Policy for Human Rights

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.

Identifying, Assessing, and Preventing Human Rights Risk

Toray Group conducts surveys related to awareness, education, and other human rights promotion activities once per year at all offices and plants, major Group companies in Japan, and overseas subsidiaries and affiliated companies. The Group verifies the results of these through the Human Rights Promotion Committee in Japan and the Global Human Rights Promotion Committee. From among the results, the Group identifies human rights related issues and problematic points, as well as points of concern, and investigates and implements initiatives in accordance with the human rights promotion framework. Moreover, the Group has designed systems (Corporate Ethics and Legal Compliance Helpline in Japan and whistle-blowing contact offices at each overseas company) that enable Group employees to report and consult on human rights issues as part of its efforts to take prompt, appropriate action when a problem occurs and to help reduce human rights risk.

Securing and Developing Human Resources to Create New Value

Training Expenditures per Employee

90,261 yen

The success or failure of a company is decided by its people—employees shape its destiny. Guided by this concept, Toray Group, both in and outside of Japan, regards human resources as the most important management resources and considers securing and developing outstanding human resources capable of performing on a global stage as a fundamental management priority. Based on the following four goals, 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

Systematic and Effective Training

Toray develops well-designed training programs and systematically executes diverse training programs to enhance management, sales and marketing, 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.

Development of Future Management Candidates

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, 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.

Promoting Diversity

Toray Group is committed to securing outstanding human resources who have a high sense of ambition and who can play an active role in global business, regardless of gender, nationality, or career history at the time of hiring, as part of our efforts to build thriving workplaces in which a diverse range of individuals can fully demonstrate their potential.

Fostering an Organizational Culture Conducive to the Career Advancement of Women

Women in Management Positions

4.9%



Toray has long advanced the creation of workplace environments in which women will feel comfortable in performing their duties. The number of female employees in upper-level positions has increased steadily, and as of April 2019, women held 9.3% of unit manager or higher positions, and 4.9% of section manager or higher positions. In fiscal 2016, based on Japan's Act on Promotion of Women's Participation and Advancement in the Workplace, enacted in that same year, Toray developed an action plan to increase the percentage of female employees promoted to managerial positions by focusing on making and steadily implementing individualized career plans and raising awareness of career development. Under this action plan, Toray has set as its immediate target to ensure an average promotion rate for women that is at least 80% that of men* for the five-year period from fiscal 2016 to

Management Training for Developing Future Management Candidates

Program	Participants	Purpose	Year started	Total participants through FY 2018
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	540
Toray Group Management School	Department managers of Group companies in Japan	Develop management candidates focusing on Group companies in Japan	2006	263
Toray Group Executive Seminar	Board members/officers of Group companies outside Japan	Develop core staff at Group companies outside Japan	2004	98
Toray Group Senior Management Seminar	Senior Manager of Group companies outside Japan	Develop management candidates focusing on Group companies outside Japan	1996	301

Human Resources Management

fiscal 2020. This figure is the Japanese Ministry of Health, Labour and Welfare's yardstick for determining whether or not excessive discrepancy exists based on gender.

* 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 four 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.

Employment of Persons with Disabilities

Percentage of Companies Achieving Legally Mandated Employment Rate of Persons with Disabilities

50.0%



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 legal minimum of 2.2% persons with disabilities, as do 50.0% 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 due to hiring difficulties. Toray will continue to focus on this issue moving forward.

Re-employment System

In order to support the participation of those 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, and has continued to apply this system ever since.

Creating a Positive Workplace for Employees

Helping Employees Maintain Work-life Balance

Percentage of Available Annual Paid Leave Used by Employees

89.7%



Toray has worked 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 both men and women. In particular, the systems Toray provides for childcare, family care, and maternity protection exceed the legally mandated minimums and have been improved for easy use. In 2007, Toray was certified as an employer that complies with the action plan standards under the Act on Advancement of Measures to Support Raising Next-Generation Children.

As part of its commitment to workplace innovation to balance work and family life, Toray strives to create a comfortable environment throughout its work sites. Since fiscal 2008, (1) regular discussions are held in each workplace to raise awareness of different working styles; (2) working late at night or on holidays is in principle prohibited; (3) all lights are turned off at a certain time at night; and (4) Company-wide "no overtime days" take place one day each month. Toray has also been working on ongoing initiatives to cut overtime hours and to encourage employees to take annual paid leave (Employees used 89.7% of available annual paid leave in fiscal 2018).

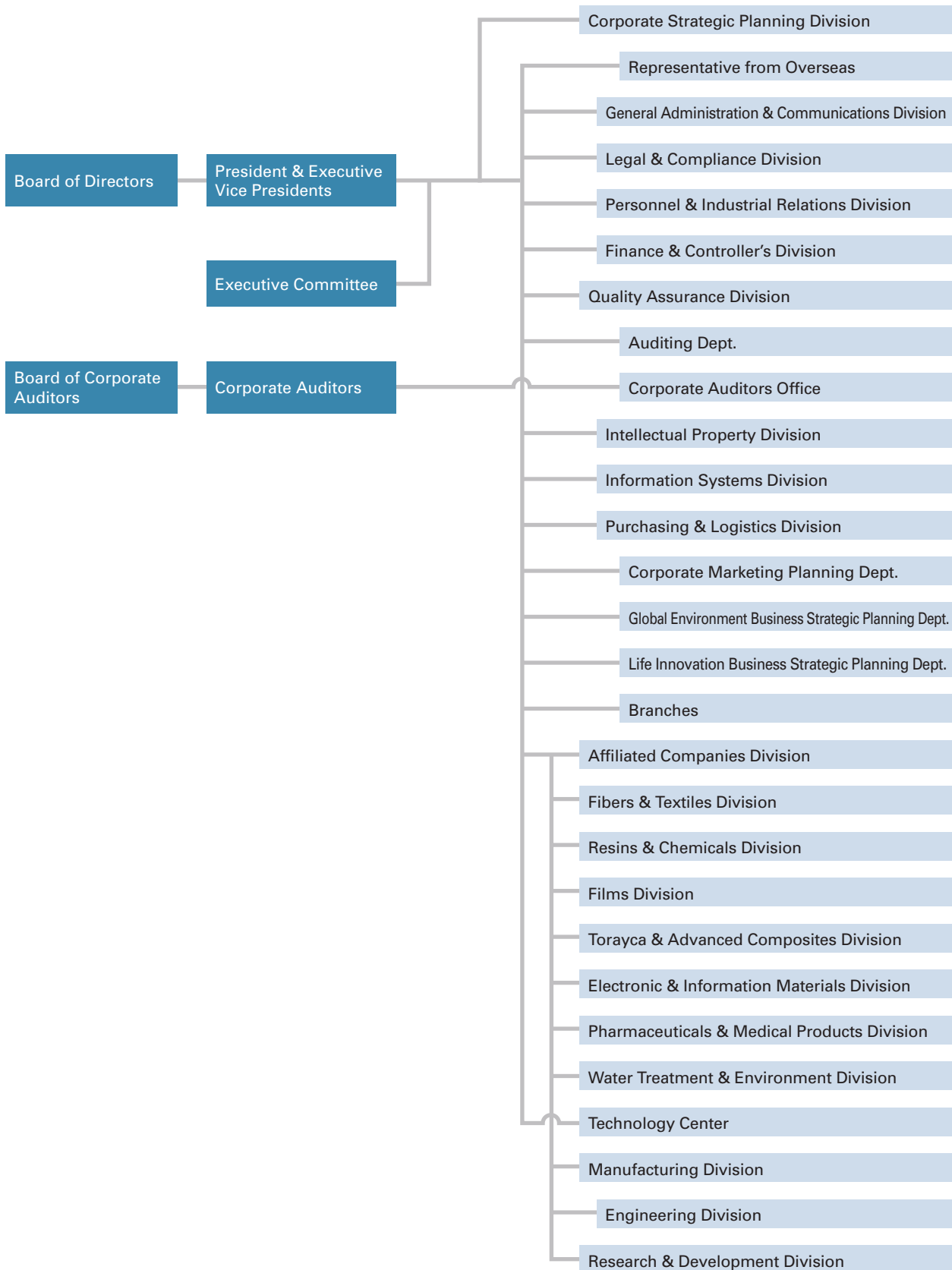
Employee Health

Toray views employee health management as a management priority, and thus undertakes related initiatives in a strategic manner. Toray works with the employee health insurance association and actively encourages the health of its employees, including through the sharing of health related information over the intranet at all offices and plants and by holding participatory events that utilize health related information websites. Toray is also addressing mental health, and since fiscal 2011 the Company has been independently implementing employee stress check-ups through an external provider. Toray uses the results of these check-ups in helping employees to recognize their own stress levels, supporting approaches to dealing with stress, and improving the workplace environment. In recognition of these efforts, in February 2019 Toray was certified as a Health and Productivity Management Organization (White 500) as it was in 2018.

Please refer to Toray Group CSR information on our website: [Toray website > Sustainability](#)

Organization

(As of July 1, 2019)



Corporate Governance

Basic Policy

From the outset, one of 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 systematizes the Management Philosophy as a Corporate Philosophy, Corporate Missions, and Corporate Guiding Principles. Among these, the Corporate Missions call for desirable relationships with stakeholders and enunciate the Group's commitment "To provide our shareholders with dependable and trustworthy management." In addition, 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."

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

Systems for Executing and Supervising Management

Toray is a company with Board of Corporate Auditors, and the members of the Board and corporate auditors are elected at the general meeting of stockholders.

Members of the Board and corporate auditors, as officers directly elected at the general meeting of stockholders, clearly recognize fiduciary responsibility to stockholders who have entrusted the management and appropriately fulfill their respective roles while discharging accountability

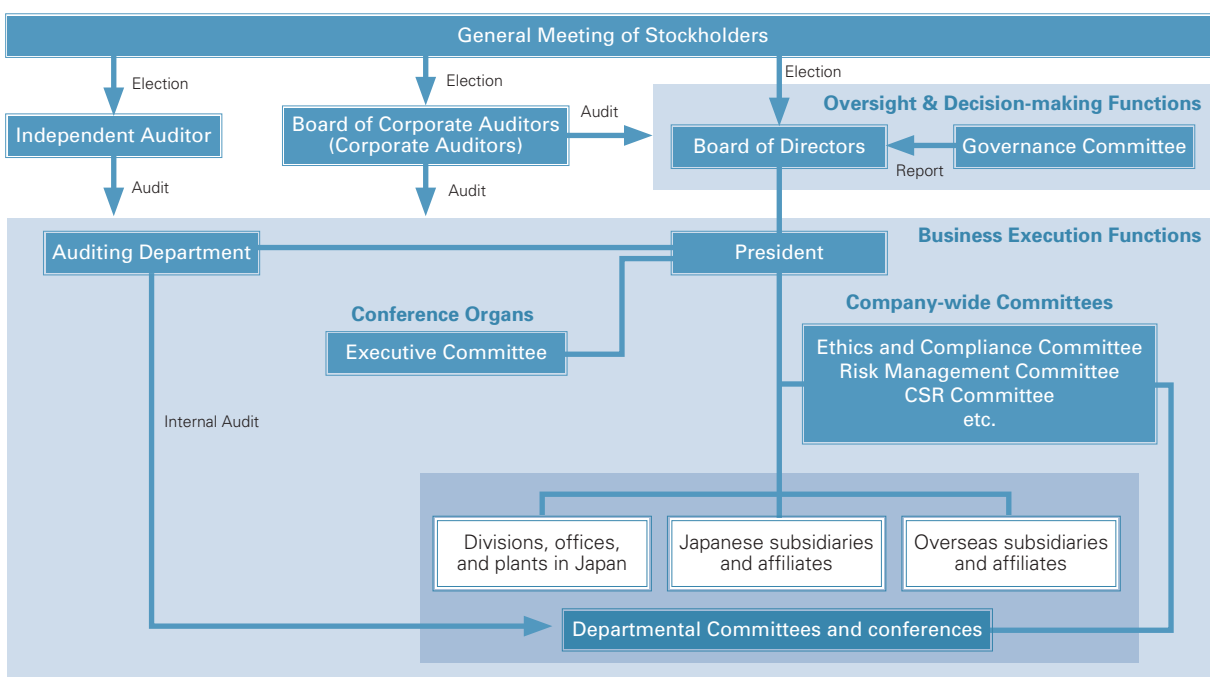
about management status to stockholders and other stakeholders.

Toray's Board of Directors consists of 19 members. Since Toray Group supplies a wide range of industries with basic materials and globally plays an active part in a broad scope of business fields, it is necessary to evaluate various risks multilaterally based on expertise relevant to the worksites, not only for management judgment and decision-making but also for oversight. To that end, the Board of Directors formulates a structure in which members of the Board familiar with Toray Group businesses oversee management and make decisions from various viewpoints.

Furthermore, the Board of Corporate Auditors oversees the execution of operations by the members of the Board based on professional knowledge in fields such as finance, accounting and law in addition to an understanding about businesses, from a standpoint entirely independent of the Board of Directors as a system to secure transparency and fairness of oversight and decision-making.

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 the Company's corporate governance over the mid- to long-term. The Governance Committee consists of the Chairman of the Board, President, and all of the outside directors, and an outside director serves as a chairperson. Deliberation at the Governance Committee encompasses matters regarding the Company's overall corporate governance matters, including the following.

Corporate Governance Structures



- Structure of the Board of Directors and the Board of Corporate Auditors
- Evaluation of the management and operation of the Board of Directors
- Policy on nominating candidates for members of the Board and corporate auditors
- Remuneration system for members of the Board and corporate auditors
- Basic policy on electing member of the senior management, including the President

Election of Outside Directors

At Toray, we ensure objectivity and transparency of corporate governance by establishing and disclosing standards for independence of outside directors and outside corporate auditors. Toray's outside directors and outside corporate auditors meet Toray's standards for independence and meet the independence requirements set by the Tokyo Stock Exchange.

We, therefore, have submitted notification to the Tokyo Stock Exchange of their status as independent officers.

The following table outlines the basis for election of our outside directors/corporate auditors and details of their independence.

Kunio Ito Director	<ul style="list-style-type: none"> • Has highly specialized expertise in accounting and business administration as a university professor • Has extensive experience as a corporate outside director • No matters affect his independence from Toray
Ryoji Noyori Director	<ul style="list-style-type: none"> • Has extensive experience as a university professor and highly specialized expertise in organic synthetic chemistry, which is a core Toray technology • Has experience as a corporate outside director • No matters affect his independence from Toray
Toshio Nagai Corporate auditor	<ul style="list-style-type: none"> • Has an excellent track record of high standing in the legal profession and a solid character and judgment, so we believe he can audit appropriately from an objective standpoint • No matters affect his independence from Toray
Kazuya Jono Corporate auditor	<ul style="list-style-type: none"> • Has held key positions in the corporate world and has solid character and judgment, so we believe he can audit appropriately from an objective standpoint • Formerly employed by Sumitomo Mitsui Banking Corporation and Citibank Japan Ltd. (current Citibank, N.A., Tokyo Branch); Toray has regular banking transactions with both banks. With respect to Sumitomo Mitsui Banking Corporation, over three years have passed since he retired from the board, and we have no borrowing from Citibank, N.A., therefore independence is not affected. Toray's balance of borrowing from Sumitomo Mitsui Banking Corporation (including syndicated loans) as of 31 March 2019 is 3.2% of total assets, which is not prominent compared with other banks.
Hiroyuki Kumasaka Corporate auditor	<ul style="list-style-type: none"> • Has advanced knowledge in accounting as well as a wealth of experience and an established track record as a certified public accountant. He is also known for his impeccable character and deep insight, and can conduct appropriate audits in an objective manner. • He first joined Fuso Audit Corporation (later known as MISUZU Audit Corporation) and served as an independent accounting auditor of the company in his capacity as a designated partner of the audit corporation for a period of time. This does not impact his independence as it has been more than three years since the audit corporation was relieved of its auditing responsibilities for the Company (in 2013).

Basic Policy on Internal Control System

To realize the Management Philosophy, the Company shall establish a structure to execute its business legally and effectively by improving its internal control system according to the following basic policy as a structure to enable it to appropriately establish organization, formulate regulations, communicate information, and monitor the execution of operations.

1. System to ensure that the execution of duties by members of the Board and employees complies with laws and regulations and the Company's Articles of Incorporation

- Toray shall establish the Ethics and Compliance Committee, as one of the company-wide committees to promote observance of corporate ethics and legal compliance, and shall take other measures to improve the

required internal systems, including the establishment of dedicated organizations.

- Toray shall establish the Corporate Ethics and Legal Compliance Code of Conduct as specific provisions to be observed by members of the Board and employees, and shall take other measures to improve the required guidelines, etc. Especially with regard to eliminating relations with antisocial forces, the Company shall act as one to stand firmly against them.
- Toray shall establish an internal reporting system (whistle-blowing system) for the reporting of the discovery of violation of laws, regulations, or the Company's Articles of Incorporation.
- Toray shall establish Security Trade Control Program, one of the most important legal compliance issues, and establish an organization dedicated to security export control.

Corporate Governance

2. System to ensure the efficient execution of duties by members of the Board

- Toray shall establish the Authority of Top Management to stipulate matters with respect to which decision-making authority is reserved by the Board of Directors and matters with respect to which decision-making is delegated to the President, general managers, etc., from among matters necessary for decision-making.
- Toray shall establish the Executive Committee as deliberative organs for important matters decided by the Board of Directors or the President. The Executive Committee shall be responsible for the general direction of policy, and shall be in charge of issues related to implementation.

3. System for preserving and managing information pertaining to the execution of duties by the members of the Board

- Toray shall establish regulations for important documents and important information related to management, confidential information and personal information, and appropriately preserve and manage them in accordance with the rules.

4. Regulations and other systems pertaining to controls over risks of loss

- Toray shall identify potential risks in business activities, promote company-wide risk management to strive to reduce the level of risk under normal business conditions, and prevent future crises, as well as improve regulations and establish an internal committee to enable immediate implementation in the event of a major crisis.
- Toray shall establish an internal control system for financial reporting that ensures the reliability of financial reporting.

5. System for ensuring appropriate business operations within subsidiaries

- To establish a system under which subsidiaries report to the Company on matters regarding the execution of duties by members of the Board, etc. of the subsidiaries, the Company shall provide regulations on the regular reporting of important management information to the Company and regularly hold conferences at which the Company's management receives direct reports on the status of the management of the subsidiaries.
- To establish regulations and other systems pertaining to controls over risks of loss for subsidiaries, the Company shall provide subsidiaries with guidance to help them to establish risk management systems appropriate for their respective business forms and business environments, and shall receive regular reports on the status of their activities.
- To establish a system for ensuring that members of the Board, etc. of subsidiaries effectively execute their duties, the Company shall provide regulations on the scope under which the Company can reserve its authority over the execution of business operations. In addition, the Company

shall endeavor to grasp management information in a unified manner and provide assistance and guidance necessary for subsidiaries by determining divisions, etc. with control over its respective subsidiaries.

- To establish a system for ensuring that the execution of duties by members of the Board, etc. and employees of subsidiaries complies with laws and regulations and the Articles of Incorporation, the Company shall thoroughly familiarize its subsidiaries with the Company's Corporate Ethics and Legal Compliance Code of Conduct as a code of conduct in common for Toray Group. At the same time, the Company shall request the subsidiaries to establish their own codes of conduct, guidelines, etc. in consideration of the laws and regulations, business practices, business forms, and other factors in their respective countries. In addition, the Company shall direct its subsidiaries to establish systems under which the status of internal whistle-blowing by members of the Board, etc. and employees of the subsidiaries is appropriately reported to the Company.

6. System for reporting to corporate auditors and systems for ensuring that persons who report to corporate auditors are not treated disadvantageously because of their reporting

- Members of the Board, etc. and employees of Toray Group and corporate auditors of subsidiaries shall report matters regarding the execution of duties to corporate auditors in response to requests from the corporate auditors.
- Department in charge of the internal reporting system (whistle-blowing system) shall regularly report the status of internal whistle-blowing in Toray Group to the corporate auditors.
- Toray shall stipulate regulations to the effect that members of the Board and employees who report to corporate auditors shall not be subjected to any disadvantageous treatment because of the said reporting, and shall provide subsidiaries with guidance to help them stipulate the same regulations.

7. Items pertaining to the handling of expenses and liabilities arising from the execution of duties by corporate auditors

- Toray shall pay expenses, etc. incurred from the execution of duties by corporate auditors.

8. Items pertaining to employees assisting with corporate auditors' duties, items pertaining to the independence of said employees from members of the Board, and items pertaining to the assurance of effectiveness of instructions from the corporate auditors to said employees

- Toray shall assign a full-time employee to provide assistance if and when corporate auditors request assistance. The said employee shall exclusively follow the corporate auditors' commands and instructions, and the Company shall consult with corporate auditors in advance with respect to the personnel arrangements for the said employee.

9. Other systems for ensuring effective implementation of audits by corporate auditors

- Corporate auditors shall attend Board of Directors meetings and other important meetings so that they may ascertain important decision-making processes and the execution of operations.
- Corporate auditors shall hold regular meetings with members of the Board and management and conduct regular visiting audits of Toray offices, plants, and subsidiaries.

Remuneration for Members of the Board

Given their roles, remuneration for internal members of the Board consists of basic remuneration (monthly remuneration,) as well as a performance-based remuneration, a bonus and stock acquisition rights as stock options. Remuneration for outside directors consists of monthly remuneration only. Remuneration is set at a level that enables the Company to secure superior human resources and further motivate them to improve performance, referring to the results of a survey of other companies' remuneration by an external third-party organization.

The Company undertakes reviews of the payment ratios of performance-based remuneration and remuneration, etc. other than performance-based remuneration as appropriate, based on the results of a survey of other companies' remuneration and deliberations at the Governance Committee, etc.

With respect to monthly remuneration, the maximum limit of total remuneration is determined at general meetings of stockholders. Within the scope of the maximum limit, monthly remuneration of each members of the Board is determined by the President based on the Company's internal regulations resolved at the Board of Directors' meeting.

The provision and the total amount of bonuses are determined each time at a general meeting of stockholders. Particulars of the agenda at the general meeting of stockholders are resolved by the Board of Directors through conference among senior management, including the President, in consideration of the consolidated operating income for each fiscal year that best represents the results of the Company's global business operations, plus the historical record, etc. A bonus to each member of the Board is determined by the President according to each member's performance based on the Company's internal regulations with a resolution at a Board of Directors meeting.

The maximum limit of total number of Stock Acquisition Rights as well as the limit of remuneration relating to the granting of the Stock Acquisition Rights as stock options to members of the Board is resolved at the general meeting of stockholders, and within that limit, the total number of Stock Acquisition Rights to be allocated to the members of the Board shall be decided at the Board of Directors meeting based on the Company's internal regulations.

Given their roles, remuneration for corporate auditors consists of monthly remuneration only. Remuneration is set at a level that enables the Company to secure superior human resources, referring to the results of a survey of other companies' remuneration by an external third-party organization.

With respect to monthly remuneration, the maximum limit of total remuneration is determined at general meetings of stockholders. Within the scope of the maximum limit, monthly remuneration to each corporate auditor is determined through consultation by corporate auditors based on the Company's internal regulations.

The Governance Committee continuously reviews the remuneration system for members of the Board and corporate auditors.

Details of Remuneration in Fiscal 2018

Position	Total remuneration (millions of yen)	Total remuneration by type (millions of yen)			Recipients
		Basic	Bonuses	Stock options as remunerations	
Members of the Board (excluding outside directors)	1,171	818	163	190	25
Corporate auditors (excluding outside corporate auditors)	79	79	—	—	2
Outside directors	24	24	—	—	2
Outside corporate auditors	19	19	—	—	2

Notes: 1. Recipients included eight members of the Board (excluding outside directors) who retired during fiscal 2018.

2. Total amounts of remuneration do not include the ¥47 million paid in salaries to eight employee-directors.

Total Remuneration Received by Members of the Board and Corporate Auditors

Name	Total consolidated remuneration (millions of yen)	Position	Status of company	Total consolidated remuneration by type (millions of yen)		
				Basic	Bonuses	Stock options as remuneration
Akihiro Nikkaku	153	Member of the Board	Filing company	104	26	22

Note: Total remuneration only includes persons receiving more than ¥100 million.

Compliance

Status of Compliance Initiatives

Toray Group recognizes the absolute importance of compliance with laws, regulations, and social norms if the company is to live up to its corporate philosophy. Moreover, contributing to society by working to resolve major global issues through the use of innovative technologies and advanced materials requires us to build and maintain relationships of trust with our various stakeholders.

In order to gain this trust and ensure Toray Group's sustainable contribution to society, it is essential to comply with the laws and regulations related to our business activities in each country in which we operate and maintain the highest level of integrity in all our actions.

Based on these concepts, top management focuses on its leadership role in making compliance a priority, requiring corporate ethics and strict compliance with the law not only within the Group, but among suppliers as well.

Ethics and Compliance

Toray has established the Ethics and Compliance Committee, as a Group-wide committee, chaired by the President and consisting of members of the Board. A joint effort between labor and management, the Committee deliberates on policies and discusses measures relating to corporate ethics. The Committee met twice in fiscal 2018, reviewing the ethics and compliance systems for Toray Group and discussing the results from activities in fiscal 2017 as well as activity plans and progress in fiscal 2018. Acting as leaders, divisional and departmental general managers at each workplace adopt a top-down approach toward promoting initiatives.

Affiliate Companies' Compliance Meeting as well as Overseas Affiliate Companies' Compliance Meetings have been established as subordinate organizations of the Ethics and Compliance Committee with respect to subsidiaries and affiliated companies in Japan and overseas. These meetings study and promote compliance activities implemented in each company, country, and region.

In addition, 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. Toray has put together the Corporate Ethics and Legal Compliance Handbook, which explains the code and gives details of the compliance helpline, to ensure comprehensive understanding for all Toray and its Japanese Group companies' executives and employees, including contracted, part-time and temporary workers.

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 on the code of conduct.

Corporate Ethics and Legal Compliance Training Initiatives

Toray posts information on CSR and legal compliance on its corporate intranet. 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. Workplace discussion is fostered by the holding of study groups and workshops at workplace where cases of misconduct by other companies are reviewed. 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 temporary workers. In fiscal 2018, Toray worked to raise awareness of human rights issues using case studies based on actual reports and consultations within Toray Group, reminding all participants that issues can occur in any department. Using the same materials, the Company implemented training at Toray Group companies in Japan.

Expanding the Whistle-Blowing System

By means of the Corporate Ethics and Legal Compliance Helpline, its whistle-blowing system, the Company emphasizes the self-correction function, by which it is expected that employees will be first to take the initiative in managing conduct with regard to corporate ethics and legal compliance, and consult with a supervisor as soon as an issue arises. Should consulting with a supervisor prove problematic, 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.

Each Toray Group company in Japan has established a Helpline contact point, and 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. Overseas subsidiaries and affiliated companies also have systems set up at all their companies, and there have been reports made in several countries and regions, so Toray is working to resolve the issues, while carefully confirming the circumstances in interviews and investigations. In addition to these moves, 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 is working to inform all Toray Group companies about the system.

The operational status of the whistle-blowing system, including the number of reports (consultations) and other details, is reported to members of the Board via the Ethics and Compliance Committee, which sits twice a year.

Reinforcing in Product Quality Assurance Compliance

To reinforce product quality assurance compliance across the Toray Group, we will mainly address the following five issues.

(1) Strengthening of the entire Toray Group's product quality assurance system

We provide guidance on the development of product quality assurance systems for each division and Group company and are promoting audits of the product quality assurance systems and the effectiveness of operations. After clarifying what product quality assurance should involve, we will set tasks based on any deviations between the actual situation and what it should be and promote improvements.

(2) Development of human resources to prevent fraud and fostering of a workplace culture

We provide product quality assurance compliance education. The education for Toray Industries, Inc. has been completed, and in fiscal 2019 we will promote product quality assurance compliance education for domestic and overseas subsidiaries and affiliated companies.

(3) Ascertain actual situation for contracts with customers for quality assurance and create guidelines

We are making headway with the compilation of contract guidelines with regard to product quality assurance. We will check contracts for conformity with the guidelines and review any necessary items.

(4) Appropriate maintenance and management of measuring equipment

Having created a risk assessment table to determine the need for the updating and maintenance of measuring equipment, we were able to pinpoint the equipment that was in need of updating. In fiscal 2019, we will deploy this method at domestic and overseas subsidiaries and affiliated companies.

(5) Setting up a quality data management system that prevents fraud

We are promoting the construction of a data management system, featuring measurement automation, the automatic transfer of measurement data, and the automatic issuance of inspection reports, which thus involves as little manual intervention as possible.

Improving Security Trade Controls

Sharing the latest trends on security trade controls and education to raise awareness of new regulations

In addition to conventional concerns about the proliferation of weapons of mass destruction, in security trade controls the necessity has arisen to carry out risk management in consideration of the changes in the international security balance. Having held a meeting of the Security Trade Control Committee, the members of which include officers from the divisions and Group companies involved in exports and technology provision, and considered the risks to be dealt with based on, for example, the latest international situation and the trend for revising laws, we decided on the measures for fiscal 2018. The committee members also hold the Division/Group Company Security Trade Control Committee and, in addition to working to thoroughly make Company-wide measures known to all, implement additional measures on matters to be addressed in the departments in charge and at related companies.

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

Having launched an e-learning course where inexperienced practitioners can learn at any time, we worked to establish basic business knowledge (A total of two programs with the participation of 3,582 employees). We also implemented a practical education program to improve the management practices, such as risk determination, export transactions, and technology provision, for more highly specialized practitioners (A total of 14 programs with the participation of 901 employees).

Having promoted in a planned manner the exam authorized by the Center for Information on Security Trade Controls in Japan, a total of 336 employees passed, bringing the cumulative total of Toray Group employees who have passed the exam to 3,771.

Compliance

(2) Conducted regular audits

Having carried out paper audits and on-site audits for each Group company, Toray 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

Having completed the development of the basic functions of the next security trade control system, we started coordination with the sales key system while repeating operational tests for each division. A system is now in place to prevent accidental shipments due to human error.

Promotion of Mission B.E.A.R. Activities

As a new measure under the slogan “Having the integrity to do the right thing in the right way” in fiscal 2018, Toray Group is promoting the following four compliance principles and more effective compliance initiatives.

Four Compliance Action Principles

- B:** Be fair, be honest and have integrity
- E:** Encourage respect and communication
- A:** Adopt a “genba” approach—Look to the facts!
- R:** Responsibility as a member of our excellent company

The “Mission B.E.A.R.” compliance program, which takes the latter part of its name from the first letter in each of the four action principles, requires Toray Group companies to identify through questionnaires compliance risks, followed by the formulation of a response plan and the implementation of countermeasures. Follow-ups on results are then conducted as part of PDCA activities.

In fiscal 2019, we will continue to monitor and support activities at each Group company aimed at promoting compliance, bolstering our risk response based on regional and operational factors, and building a corporate culture centered on integrity.



Implementing Internal Legal Audits

In fiscal 2016, Toray adopted a Group-wide system for self-inspections and mutual internal control audits and has conducted internal legal and compliance audits of designated Toray divisions and departments and domestic and overseas subsidiaries and affiliated companies every two years. Having conducted legal and compliance internal audits of the designated companies of overseas subsidiaries and affiliated companies in fiscal 2017, in fiscal 2018 the Company confirmed the improvement status of the items pointed out by the audit and that the rate of improvement had reached 100% (including those under improvement). In fiscal 2018, we also conducted internal legal and compliance audits of designated Toray divisions and departments and domestic subsidiaries and affiliated companies.

Tax Compliance Efforts

Toray Group strives to pay tax properly in accordance with international standards, such as the tax laws and related rules of each country/region and OECD guidelines. With regard to transfer prices, which have become increasingly important with the increase in international transactions, we strive for appropriate income distribution by calculating transaction prices after taking into consideration the principles between independent companies. In addition, Toray neither performs tax planning with the intention of making excessive tax savings nor conducts arbitrary tax avoidance through the use of tax havens.

Analyzing and Evaluating the Effectiveness of the Board of Directors

Process of Analysis and Evaluation

Over the period from late-March 2019 to mid-April 2019, Toray's Board of Directors conducted a "Questionnaire Survey to Evaluate the Effectiveness of the Board of Directors in the fiscal year ended March 31, 2019." The 23 survey respondents, who comprised all of the Board members and corporate auditors, answered questions on the following survey items and gave their names.

- (1) Management Philosophy and Corporate Missions
- (2) Size and structure of the Board of Directors
- (3) Segregation of oversight and business operations
- (4) Provision of information prior to Board of Directors meetings
- (5) Number of agenda at Board of Directors meetings
- (6) Proceedings at Board of Directors meetings
- (7) Management response to opinions, etc. at Board of Directors meetings
- (8) Authority of the Board of Directors
- (9) Appropriate response to conflicts of interest
- (10) Communication with stakeholders
- (11) Communication among members of the Board
- (12) Opportunities to acquire knowledge
- (13) Compliance promotion
- (14) Overall evaluation

In addition to the questionnaire, secretariat of the Board of Directors individually interviewed outside directors and outside corporate auditors (total of four persons) to hear their opinions in relation to their responses to the questionnaire.

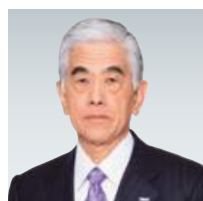
The survey results were analyzed and evaluated at the Governance Committee held on June 11, 2019 and the results of the analysis and evaluation were deliberated at the Board of Directors meeting held on June 20, 2019. The following overview of the results of the analysis and evaluation describes the contents resolved at the Board of Directors meeting.

Overview of the Results of the Analysis and Evaluation

- (1) In the fiscal year ended March 31, 2019, the Board of Directors performed oversight and decision-making based on a deep understanding and sympathy with the Management Philosophy and Corporate Missions. As a result, we believe that the Board of Directors generally fulfilled its roles and responsibilities in indicating the direction of corporate strategies and other major courses of action in an appropriate manner.
- (2) In the fiscal year ended March 31, 2019, the Board of Directors held 15 meetings in total to perform oversight and decision-making in a timely and appropriate manner. Furthermore, it promoted reviews on the scope of delegating decision-making authority. Through these initiatives, we believe that the Board of Directors generally fulfilled its roles and responsibilities in establishing an environment conducive to appropriate risk-taking by the senior management in an appropriate manner.
- (3) With respect to the 15 Board of Directors meetings held in the fiscal year ended March 31, 2019, the attendance rate of the members of the Board was 100%. Outside directors made remarks mainly from their respective professional viewpoints. The opinions, etc. at the Board of Directors meetings, including the abovementioned remarks, were appropriately reflected in measures taken by the management. With respect to transactions causing possible conflicts of interest, internal procedures to handle them were appropriately carried out. In light of the above, we believe that the Board of Directors generally fulfilled its roles and responsibilities in carrying out the effective oversight of members of the Board and the management from an independent and objective standpoint in an appropriate manner.
- (4) Based on the above, we believe that the Board of Directors generally fulfilled its roles and responsibilities in an effective manner in the fiscal year ended March 31, 2019. With regard to the matter, "further activating discussions at the Board of Directors meetings," however, specific measures for improvement must be taken in the fiscal year ending March 31, 2020 and thereafter to further improve the effectiveness of the Board of Directors.
- (5) With respect to the opinions, etc. received from the members of the Board and corporate auditors in the course of evaluating the effectiveness of the Board of Directors, the Governance Committee shall deepen discussions based on those opinions with a view to further improving the effectiveness of the Board of Directors, as necessary.

Board of Directors and Corporate Auditors

(As of June 25, 2019)



President and Representative Member of the Board

Akihiro Nikkaku

Chief Executive Officer, Chief Operating Officer

1973 Joined the Company
2001 General Manager, Engineering Division; General Manager, Second Engineering Dept.
2002 Vice President (Member of the Board)
2004 Senior Vice President (Member of the Board & Member of the Executive Committee)
2006 Senior Vice President (Member of the Board & Member of the Executive Committee)
2007 Executive Vice President and Representative Member of the Board
2010 President and Representative Member of the Board (incumbent)



Executive Vice President and Representative Member of the Board

Koichi Abe

In charge of Intellectual Property Division, Global Environment Business Strategic Planning Dept., and Life Innovation Business Strategic Planning Dept.; General Manager, Technology Center, General Manager, Toray Human Resources Development Center

1977 Joined the Company
2004 General Manager, Aichi Plant
2005 Vice President (Member of the Board)
2009 Senior Vice President (Member of the Board)
2011 Senior Vice President (Member of the Board & Member of the Executive Committee)
2013 Senior Vice President and Representative Member of the Board
2014 Executive Vice President and Representative Member of the Board (incumbent)



Executive Vice President and Representative Member of the Board

Ryo Murayama

In charge of Marketing and Sales; in charge of Corporate Marketing Planning Dept., and branches; General Manager, Affiliated Companies Division

1973 Joined the Company
2005 General Manager, LCD Materials Division
2008 Vice President (Member of the Board)
2010 Senior Vice President (Member of the Board)
2013 Senior Vice President (Member of the Board and Member of the Executive Committee)
2018 Executive Vice President and Representative Member of the Board (incumbent)



Executive Vice President and Representative Member of the Board

Yukichi Deguchi

General Manager, Corporate Strategic Planning Division; General Manager, Quality Assurance Division; in charge of Legal & Compliance Division (Security Trade Administration Dept.), HS Business Development Dept.

1973 Joined the Company
2009 Assistant General Manager, Research & Development Division
2009 Vice President (Member of the Board)
2012 Senior Vice President (Member of the Board)
2014 Senior Vice President (Member of the Board and Member of the Executive Committee)
2018 Executive Vice President and Representative Member of the Board (incumbent)



Senior Vice President (Member of the Board and Member of the Executive Committee)

Mitsuo Ohya

General Manager, Fibers & Textiles Division; General Manager, Osaka Head Office

1980 Joined the Company
2009 General Manager, Industrial & Textile Fibers Division
2012 Vice President (Member of the Board)
2014 Retired from Vice President (Member of the Board)
President and Representative Member of the Board, Toray International, Inc.
2016 Senior Vice President (Member of the Board & Member of the Executive Committee) (incumbent)



Senior Vice President (Member of the Board and Member of the Executive Committee)

Hiroshi Otani

General Manager, Water Treatment & Environment Division; Chairman, Toray Asia Pte. Ltd. (part-time)

1978 Joined the Company
2011 Assistant General Manager, Water Treatment & Environment Division
2011 Vice President (Member of the Board)
2014 Senior Vice President (Member of the Board)
2018 Senior Vice President (Member of the Board & Member of the Executive Committee) (incumbent)



Senior Vice President (Member of the Board and Member of the Executive Committee)

Toru Fukasawa

General Manager, Finance & Controller's Division

1978 Joined the Company
2010 Chief Executive Representative for America; Chief Representative for America; Chairman, Toray Holding (U.S.A.), Inc.; President, Toray Industries (America), Inc.
2012 Vice President (Member of the Board)
2015 Senior Vice President (Member of the Board)
2018 Senior Vice President (Member of the Board & Member of the Executive Committee) (incumbent)



Senior Vice President (Member of the Board and Member of the Executive Committee)

Kazuo Morimoto

General Manager, Torayca & Advanced Composites Division; Chairman, Toray Carbon Fibers Europe S.A. (part-time)

1975 Joined the Company
2008 General Manager, Purchasing & Logistics Division
2009 Vice President (Member of the Board)
2012 Retired from Vice President (Member of the Board)
Chief Executive Representative for the Americas; Chairman, Toray Holding (U.S.A.), Inc.; President, Toray Industries (America), Inc.
2015 President and Representative Member of the Board, Du Pont-Toray Co., Ltd.
2017 Senior Vice President (Member of the Board)
2018 Senior Vice President (Member of the Board & Member of the Executive Committee) (incumbent)



Senior Vice President (Member of the Board and Member of the Executive Committee)

Osamu Inoue

General Manager, Films Division; Chairman, Toray Films Europe S.A.S. (part-time)

1976 Joined the Company
2008 Chairman, Toray Plastics Europe S.A.S.; Chairman, Toray Films Europe S.A.S.
2010 Vice President (Member of the Board)
2012 Retired from Vice President (Member of the Board)
President and Representative Member of the Board, Toray Battery Separator Film Co., Ltd.
2017 Assistant General Manager, Films Division
Senior Vice President (Member of the Board)
2018 Senior Vice President (Member of the Board & Member of the Executive Committee) (incumbent)



Senior Vice President
(Member of the Board)

Hirofumi Kobayashi

General Manager, Pharmaceuticals & Medical Products Division

- 1983 Joined the Company
- 2011 General Manager, Electronic & Information Materials Division (Technology and Manufacturing)
- 2013 Vice President (Member of the Board)
- 2016 Senior Vice President (Member of the Board) (incumbent)



Senior Vice President
(Member of the Board)

Tetsuya Tsunekawa

General Manager, Research & Development Division; General Manager, Basic Research Center

- 1984 Joined the Company
- 2012 General Manager, Tsuchiura Plant
- 2014 Vice President (Member of the Board)
- 2016 Senior Vice President (Member of the Board) (incumbent)



Senior Vice President
(Member of the Board)

Takashi Fujimoto

General Manager, Information Systems Division, Purchasing & Logistics Division; General Manager, Engineering Division

- 1980 Joined the Company
- 2014 Vice President and Representative Member of the Board, Toray Precision Co., Ltd.
- 2016 Vice President (Member of the Board)
- 2018 Senior Vice President (Member of the Board) (incumbent)



Senior Vice President
(Member of the Board)

Kazuyuki Adachi

General Manager, Manufacturing Division; General Manager, Textile Technology & Manufacturing Division

- 1980 Joined the Company
- 2004 President, Toray Textiles Central Europe s.r.o.
- 2013 Director, Toray Industries (China) Co., Ltd.; Chairman and President, Toray Sakai Weaving & Dyeing (Nantong) Co., Ltd.
- 2016 Director, Toray Industries (Thailand) Co., Ltd.; President, Luckytex (Thailand) Public Company Limited
- 2018 Senior Vice President (Member of the Board) (incumbent)



Vice President
(Member of the Board)

Shigeki Taniguchi

General Manager, Personnel & Industrial Relations Division

- 1983 Joined the Company
- 2015 General Manager, General Administration & Legal Division; General Manager, General Administration Dept.
- 2016 Vice President (Member of the Board) (incumbent)



Vice President
(Member of the Board)

Hideki Hirabayashi

In charge of CSR; General Manager, Legal & Compliance Division; General Manager, General Administration & Communications Division; General Manager, Tokyo Head Office

- 1981 Joined the Company
- 2016 General Manager, General Administration & Legal Division; General Manager, General Administration Dept.
- 2017 Vice President (Member of the Board) (incumbent)



Vice President
(Member of the Board)

Hiroshi Enomoto

General Manager, Electronic & Information Materials Division

- 1983 Joined the Company
- 2012 General Manager, Electronic Materials Division, General Manager, Electronic & Information Materials Dept.
- 2018 Vice President (Member of the Board) (incumbent)



Vice President
(Member of the Board)

Nobuyuki Inohara

General Manager, Resins & Chemicals Division

- 1983 Joined the Company
- 2005 General Manager, Polyester Polymers Dept.
- 2010 General Manager, Torayca Reinforced Plastics Dept.
- 2013 General Manager, Resins Division & General Manager, Torayca Reinforced Plastics Dept.
- 2014 General Manager, Resins Division
- 2015 President and Representative Member of the Board, Toray Plastics Precision Co., Ltd.
- 2019 Vice President (Member of the Board) (incumbent)



Outside Director
Kunio Ito

- 2002 Dean, Graduate School of Commerce and Management and Faculty of Commerce and Management, Hitotsubashi University
- 2004 Executive Vice President and Board Member, Hitotsubashi University
- 2013 Director, Kobayashi Pharmaceutical Co., Ltd. (incumbent)
- 2014 Director, Seven & i Holdings Co., Ltd. (incumbent)
- Vice President (Member of the Board) of the Company (incumbent)
- 2018 Research Professor, Department of Business Administration, Hitotsubashi University Business School (incumbent)



Outside Director
Ryoji Noyori

- 1997 Dean, Graduate School of Science and School of Science, Nagoya University
- 2001 Director, TAKASAGO INTERNATIONAL CORPORATION (incumbent)
- 2003 President, RIKEN
- 2004 Special Professor, Nagoya University (incumbent)
- 2015 Director-General, Center for Research and Development Strategy, Japan Science and Technology Agency (incumbent)
- Vice President (Member of the Board) of the Company (incumbent)



Corporate Auditor
Shogo Masuda

- 1975 Joined the Company
- 2006 Assistant General Manager, Affiliated Companies Division; General Manager, Affiliated Companies Administration Dept.; General Manager on Special Assignment, Corporate Strategic Planning Division
- 2007 Vice President (Member of the Board)
- 2011 Senior Vice President (Member of the Board)
- 2016 Senior Vice President (Member of the Board & Member of the Executive Committee)
- 2017 Corporate Auditor (incumbent)



Corporate Auditor
Shoshiro Taneichi

- 1979 Joined the Company
- 2012 General Manager, Shiga Plant
- 2016 Corporate Auditor (incumbent)



Outside Corporate Auditor
Toshio Nagai

- 2008 Chief Research Officer, Supreme Court
- 2012 President, Hiroshima High Court
- 2013 President, Osaka High Court
- 2014 Mandatorily retired
- Registered as a lawyer (The Dai-ichi Tokyo Bar Association)
- Takusyou Sogo Law Office (incumbent)
- 2015 Outside Corporate Auditor of the Company (incumbent)
- 2016 Outside Corporate Auditor, SUMITOMO CORPORATION (incumbent)



Outside Corporate Auditor
Kazuya Jono

- 1977 Joined Mitsui Bank, Limited
- 2005 Executive Officer, Sumitomo Mitsui Banking Corporation
- 2007 Managing Executive Officer, Sumitomo Mitsui Banking Corporation
- 2010 Senior Managing Director, Sumitomo Mitsui Banking Corporation
- 2012 Retired
- Representative Director, President & CEO, Citibank Japan Ltd.
- 2014 Retired
- 2015 Outside Corporate Auditor of the Company (incumbent)
- 2019 Outside Corporate Auditor, Brother Industries (incumbent)



Outside Corporate Auditor
Hiroyuki Kumasaka

- 1973 Joined FUSO Audit Corporation (later MISUZU Audit Corporation)
- 2007 Chairs of the Board of Council; Head, Tokyo Office, the Audit Corporation
- Representative Liquidator, the Audit Corporation
- 2008 Outside Corporate Auditor, MATSUDA SANGYO CO., LTD.
- 2011 External Corporate Auditor of the Board, Japan Airlines Co., Ltd.
- 2015 Outside Audit and Supervisory Committee Member, MATSUDA SANGYO CO., LTD.
- 2019 Outside Corporate Auditor of the Company (incumbent)

Comments from the Outside Directors

I will make contributions by increasing the quality of corporate governance and ensuring sustainable growth of Toray's corporate value.

Kunio Ito

Outside Director

Q How would you rate Toray's corporate governance?

A The sense of discipline that forms the basis of corporate governance is firmly entrenched in Toray's employees and management. Moreover, considerable progress is being made to further energize the Board of Directors which plays a central role in the governance function. As a part of efforts to evaluate the effectiveness of the Board of Directors, we are drawing on the results of signed questionnaires. Steps are being taken to analyze any changes from the previous year and discrepancies between the evaluations by internal and outside directors. In addition, detailed hearings with outside directors and outside corporate auditors are being held to clarify issues for the next fiscal year. Furthermore, the level of competence exhibited by the Governance Committee, which also encompasses the nomination and remuneration functions, continues to improve with each passing year.

Q What do you believe is your role as an outside director?

A The role of an outside director, as I see it, is to properly grasp the background behind each agenda item presented to the Board of Directors and the impact on corporate value. Moreover, outside directors need to exercise judgment from a long-term perspective and not a myopic view. At the same time, outside directors must ensure that the activities and decisions of the Company can be explained to all stakeholders including shareholders, from the standpoint of a third party. As chairperson of the Governance Committee, which serves as an advisory body to the Board of Directors, I will contribute to efforts aimed at putting in place a proper succession plan as well as the remuneration system. I will also focus on steadily increasing the quality of governance and to secure the sustainable growth of Toray's corporate value.

Q What issues do you think the Company will face in its efforts to secure sustainable growth?

A Toray has been actively engaged in the development of advanced technologies in order to realize its overarching philosophy and strong belief that materials have the power to bring about fundamental transformations in society. Looking ahead, the Company must continue to ramp up and further enhance these efforts. However, in this VUCA* era of intense environmental change, I would like Toray to foster an agile organizational culture. At the same time, it is important that the Company further entrench an entrepreneurial spirit in its employees going forward. In this sense, I would hope that employees enjoy the freedom to paint their own picture as if working on a blank canvas when actively promoting open innovation with startups and other companies. Put simply, it is vital that Toray remains a leading company in solving social issues.

* VUCA: Acronym for "Volatility," "Uncertainty," "Complexity," and "Ambiguity"

I will express my opinion on
Toray's research and technological development
issues and human resource development.

Ryoji Noyori

Outside Director

Q How would you rate Toray's corporate governance?

A For many years, Toray Group has won an acknowledged reputation for being an organization acting with the greatest sincerity by accumulated efforts of its forerunners. Regrettably, there were deviant acts in product quality control at a subsidiary the year before last that brought considerable disgrace upon the Group as a whole. On the other hand, the case served as an opportunity to promote a restoration of discipline from every point of view across the entire organization. Amid the increase in overseas activities in the coming years, the Company should be highly evaluated for making every effort to avoid unforeseen circumstances by ingraining the Toray spirit even in different cultural regions.

Q What do you believe is your role as an outside director?

A As a lowly government servant, I have long been involved in scientific research and education at universities and have participated in the administration of national research and development institutes as well as in the formulation of policies for promoting Japan's science and technology. I have also broadened my knowledge of overseas situation in these areas. Based on those experiences, I believe that I am mainly responsible for advising on Toray's research, technological development issues, and human resource development. Manufacturing is the basis of Japanese industry, and "materials have the power to change the world," but the future business environment is not an extension of that of today. I would thus like to watch closely the trend and request change in awareness.

Q What issues do you think the Company will face in its efforts to secure sustainable growth?

A Toray, with its leading technology, should evolve from being "Japan's No. 1 materials company" to "the Company that attracts the world." If that is the case, what kind of technologies are required in the new era? Not only its R&D teams, but also Toray as a whole should sharpen sensitivities, gather knowledge, and create new values on their own. Such a spirit is required. Toray must not stay as the downstream industry servant. From the perspective of fairness between the current and future generations, it is inevitable that society will shift to a "circular economy." I would like you to lead the future society proactively with pride.



Stakeholder Engagement

Toray Group has established Basic Policies to Promote Dialogue with Stakeholders. We are proactively communicating with various stakeholders in all aspects of our corporate activities. With the goal of strengthening our system for engaging with stakeholders, we established a new organization to supervise communications in general in April 2018, and we are working on centralizing the function of information transmission for both internal and external of the Company.

Engaging with Stockholders and Investors

The Group actively communicates with institutional investors and securities company analysts by providing information materials when requested and holding same-day results briefings when quarterly earnings are announced. In addition to IR materials, including annual reports, the Group also provides a wide range of information on management policies and strategies, as well as financial and earnings information in the Investor Relations section of the Toray website.

We also hold briefings on business for stockholders in order to deepen their understanding of Toray Group.

In fiscal 2018, Toray held four results briefings and held 560 meetings with investors and analysts.

Engaging with Business Partners

While providing materials and products as a manufacturer of advanced materials, Toray Group must engage in upstream management of its supply chains to better fulfill the needs of its customers, including the areas of production facilities and procured raw materials and resources. Accordingly, the Group has established its Basic Purchasing Policies and Basic Distribution Policies to emphasize this approach and ensure fair business activities. Throughout the Group we are promoting proper and fair transactions, adherence to laws, environmental preservation, respect for human rights, improvements in quality and other policies in initiatives with regard to corporate responsibility in procurement, purchasing, and distribution.

Engaging with the Mass Media

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, acting as the public's point of contact with the Company. 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 2018, the Company issued 180 press releases and responded to 295 media requests for information.

Engaging with Customers

Toray believes that the customer comes first. We closely communicate with our customers, mainly through our marketing and sales departments, and periodically conduct customer satisfaction surveys. The results of these surveys are shared internally at Board meetings and through in-house newsletters as we strive to provide even higher quality customer service.

We have also established showrooms at a number of locations, including the head office in Tokyo, the Toray Shiga Plant, and the Toray Human Resources Development Center in Mishima, Shizuoka Prefecture, showing our businesses and product applications in an easy-to-understand manner to the public so as to deepen their understanding of Toray Group's stance toward contributing to solving various problems by creating and providing innovative technologies and cutting-edge materials.

Engaging with Employees

Using in-house newsletters, the company intranet, and company-wide bulletin boards, Toray Group actively promotes communication with its employees to not only disseminate information on company policies and issues, but to improve cohesion of the Toray brand and heighten each employee's sense of belonging.

In addition to messages from the President being provided in all media, in-house newsletters are published in Japanese, English, and Chinese, with the goal of sharing information and promoting understanding of current projects and key management and business topics.

In addition, in 2017, we established TORAY NAVI Lite, an intranet site geared toward Group companies in and outside of Japan, representing the construction of global infrastructure for the sharing of information.

Engaging with Local Communities

In addition to holding informal gatherings for discussion regularly, Toray Group strives to engage in more active dialogue with nearby residents in a variety of other settings, including by participating in events sponsored by local governments and inviting local residents onto plant grounds for summer festivals. Following Toray Group Social Initiative Policies, we aim for our social contribution activities to contribute to sustainable development while meeting the expectations of local communities. A specific example of this is the establishment of Toray Science Foundation in Japan, and similar foundations in Malaysia, Thailand, Indonesia, and the Republic of Korea, which contribute to raising the level of science and technology in these countries. We also actively promote sports in Asia by co-sponsoring the Shanghai International Marathon.

External Evaluation

Toray was included in the following SRI indices as of June 30, 2019.

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.



Ethibel Pioneer & Excellence Registers

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.



Selected for inclusion in the FTSE4Good Index Series

Toray was selected for inclusion in the FTSE4Good Index Series. The FTSE4Good Index Series was developed by UK-based FTSE Russell. Those companies that implement outstanding ESG practices are selected for this index series.



Selected for inclusion in the Euronext Vigeo World 120 Index

Toray was selected for inclusion in the Euronext Vigeo World 120 Index. The Euronext Vigeo World 120 Index is a stock index developed by Euronext, a European exchange located in Amsterdam, the Netherlands and Vigeo Eiris (France, UK), an ESG rating and research agency. This index is composed of the 120 top ranked leading companies in ESG selected from major corporations in Europe, North America, and Asia-Pacific region.

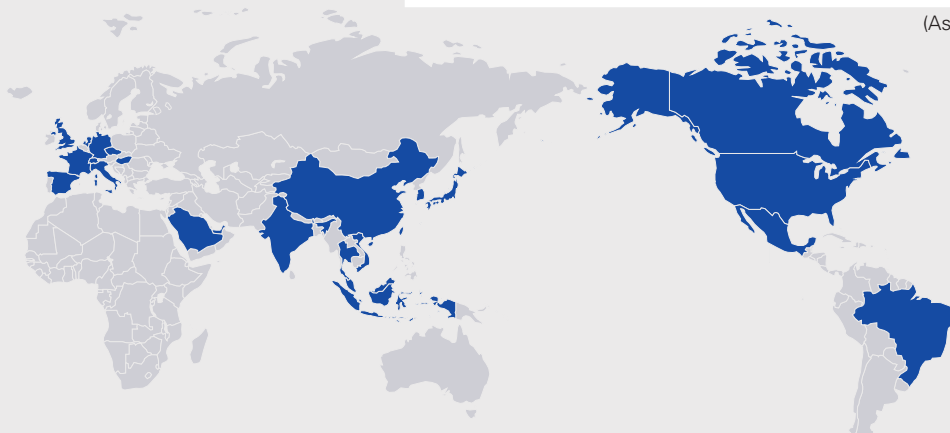


Toray Group Worldwide Network

Toray Group operates businesses in 26 countries and regions including Japan.

	Japan	Overseas	Total
Consolidated subsidiaries	61	124	185
Subsidiaries accounted for by equity method	26	29	55
Total subsidiaries	87	153	240
Affiliates accounted for by equity method	14	21	35
Companies subject to consolidation	101	174	275

(As of March 31, 2019)



DATA

Japan

Consolidated Subsidiaries

- Ichimura Sangyo, Co., Ltd.
- Toray Plastics Precision Co., Ltd.
- Toray Fine Chemicals Co., Ltd.
- Soda Aromatic Co., Ltd.
- Toray Advanced Film Co., Ltd.
- Suido Kiko Kaisha, Ltd.
- Toray Construction Co., Ltd.
- Toray Engineering Co., Ltd.
- Toray Medical Co., Ltd.
- Toray Systems Center, Inc.
- Toray Enterprise Corp.
- Toray International, Inc.
- Chori Co., Ltd.

Affiliates Accounted for by Equity Method

- Du Pont-Toray Co., Ltd.
- Toray Opelontex Co., Ltd.
- Japan Vilene Company, Ltd.
- Dow Corning Toray Co., Ltd.
- Sanyo Chemical Industries, Ltd.

United Kingdom

Consolidated Subsidiaries

- Toray Textiles Europe Ltd.

Italy

Consolidated Subsidiary

- Alcantara S.p.A.

France

Consolidated Subsidiaries

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

China

Consolidated Subsidiaries

- Toray Fibers (Nantong) Co., Ltd.
- Toray Sakai Weaving & Dyeing (Nantong) Co., Ltd.
- Toray Polytech (Nantong) Co., Ltd.
- Toray Industries (H.K.) Ltd.
- Toray Plastics (China) Co., Ltd.
- Toray Industries (China) Co., Ltd.

Affiliates Accounted for by Equity Method

- Pacific Textiles Holdings Ltd.

Republic of Korea

Consolidated Subsidiaries

- Toray Advanced Materials Korea Inc.
- Toray Battery Separator Film Korea Limited
- STEMCO, Ltd.

Affiliates Accounted for by Equity Method

- STECO, Ltd.

Malaysia

Consolidated Subsidiaries

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

Indonesia

Consolidated Subsidiaries

- P.T. Indonesia Toray Synthetics
- P.T. Toray Polytech Jakarta

Thailand

Consolidated Subsidiaries

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

U.S.A.

Consolidated Subsidiaries

- Toray Plastics (America), Inc.
- Toray Resin Co.
- Toray Composite Materials America, Inc.
- Zoltek Companies, Inc.
- Toray Advanced Composites USA Inc.

Others

- Fibers & Textiles
- Performance Chemicals
- Carbon Fiber Composite Materials
- Environment & Engineering
- Life Science
- Others
- Trading

Major Offices and Plants in Japan

Osaka Head Office

Branches

Nagoya, Hokuriku, Kyushu, Tohoku, Chugoku & Shikoku

Plants

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

Overseas Offices

U.S.A.

Toray Industries (America), Inc.

Germany

Toray Industries Europe GmbH

China

Toray Industries, Inc., Beijing Office

Republic of Korea

Toray Industries Korea Inc.

India

Toray Industries (India) Private Limited

Brazil

Toray do Brasil Ltda.

FINANCIAL SECTION

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Ten-Year Summary of Selected Financial Data

Toray Industries, Inc. and Consolidated Subsidiaries
Years ended March 31

	2010	2011	2012
Net sales	¥ 1,359,631	¥ 1,539,693	¥ 1,588,604
Fibers & Textiles	525,204	584,115	638,375
Performance Chemicals	—	—	—
Carbon Fiber Composite Materials	50,676	67,018	69,914
Environment & Engineering	159,787	178,183	170,247
Life Science	46,656	52,430	55,554
Others	14,140	13,621	13,295
Plastics & Chemicals	332,735	382,299	397,815
IT-related Products	230,433	262,027	243,404
Operating income	40,107	100,087	107,721
Income (loss) before income taxes	(2,415)	82,893	101,091
Net income (loss) attributable to owners of parent	(14,158)	57,925	64,218
Net cash provided by operating activities	166,215	129,214	104,410
Depreciation and amortization	74,904	70,479	67,443
Capital expenditures	57,073	55,942	98,384
Total assets	1,556,796	1,567,470	1,581,501
Property, plant and equipment, net	580,344	531,595	561,923
Interest-bearing liabilities	632,160	493,509	481,906
Net assets	518,216	640,970	674,149
Per share of common stock:			
Net income (loss) attributable to owners of parent:			
Basic	¥ (10.12)	¥ 36.41	¥ 39.41
Diluted	—	34.43	37.46
Cash dividends	5.00	7.50	10.00
Net assets	336.65	363.90	384.90
Ratios:			
Operating income to net sales	2.95	6.50	6.78
Net income (loss) attributable to owners of parent to net sales	(1.04)	3.76	4.04
Equity ratio	30.3	37.8	39.7
Return on equity	(3.0)	10.9	10.5
Debt/equity ratio (times)	1.34	0.83	0.77
Common stock price range:			
High	¥ 591	¥ 643	¥ 631
Low	390	420	511
Number of employees	37,936	38,740	40,227

*1 Certain overseas subsidiaries adopted IAS 19 "Employee Benefits" (revised on June 16, 2011) effective from the year ended March 31, 2014. The related figures for the year ended March 31, 2013 are retrospectively restated accordingly.

*2 Toray Group changed the reportable segments effective from the year ended March 31, 2018. The related figures for the year ended March 31, 2017 are retrospectively restated accordingly.

*3 "Partial Amendments to Accounting Standard for Tax Effect Accounting" (Accounting Standards Board of Japan (ASBJ) Statement No. 28, February 16, 2018) is applied from the year ended March 31, 2019 and onward. The related figures for the year ended March 31, 2018 are retrospectively restated accordingly.

Millions of yen

2013 ^{*1}	2014	2015	2016	2017 ^{*2}	2018 ^{*3}	2019
¥ 1,592,279	¥ 1,837,778	¥ 2,010,734	¥ 2,104,430	¥ 2,026,470	¥ 2,204,858	¥ 2,388,848
632,150	755,474	856,676	892,039	856,124	913,610	974,265
—	—	—	—	724,648	803,310	868,847
77,620	113,342	158,365	186,196	161,608	177,949	215,913
178,355	180,197	179,988	183,324	212,548	238,256	257,673
56,599	58,205	57,039	55,841	54,150	53,803	53,653
14,127	14,277	14,321	14,720	17,392	17,930	18,497
395,835	470,542	496,370	521,238	—	—	—
237,593	245,741	247,975	251,072	—	—	—
83,436	105,253	123,481	154,480	146,893	156,464	141,469
77,828	97,760	114,469	137,808	139,012	136,612	127,419
48,477	59,608	71,021	90,132	99,418	95,915	79,373
100,815	161,455	141,282	196,142	173,958	129,180	176,239
67,588	78,743	81,480	91,168	89,073	95,815	101,711
99,135	118,207	124,929	136,556	152,039	153,324	172,696
1,731,933	2,119,683	2,357,925	2,278,386	2,396,785	2,575,910	2,788,351
627,240	781,235	855,593	830,612	881,434	927,029	996,876
532,002	654,163	700,258	704,253	716,399	816,325	976,251
778,626	944,625	1,080,757	1,024,909	1,100,176	1,169,188	1,213,944
Yen						
¥ 29.75	¥ 36.59	¥ 44.33	¥ 56.38	¥ 62.17	¥ 59.97	¥ 49.61
28.90	35.70	44.28	56.31	62.10	59.90	49.56
10.00	10.00	11.00	13.00	14.00	15.00	16.00
444.45	527.32	616.70	591.50	638.64	681.92	706.95
%						
5.24	5.73	6.14	7.34	7.25	7.10	5.92
3.04	3.24	3.53	4.28	4.91	4.35	3.32
41.8	40.5	41.8	41.5	42.6	42.3	40.6
7.2	7.5	7.7	9.3	10.1	9.1	7.1
0.73	0.76	0.71	0.74	0.70	0.75	0.86
Yen						
¥ 654	¥ 786	¥ 1,057.5	¥ 1,146.0	¥ 1,027.5	¥ 1,208.0	¥ 1,035.5
421	584	626	871.7	854.0	903.1	705.1
42,584	45,881	45,789	45,839	46,248	45,762	48,320

DATA

Management's Discussion and Analysis

OVERVIEW

For the year ended March 31, 2019, the global economy as a whole continued to recover gradually, underpinned by the strong U.S. economy amid prolonged pressure from the uncertain future weighing on the economy, but the pace of growth slowed in the second half of the fiscal year due to intensified trade frictions and the notable deceleration in the Chinese economy. The Japanese economy continued on its gradual recovery track, as both the corporate and household sectors remained steady in general, although there were some weaknesses in exports and production towards the end of the fiscal year.

At the same time, however, the rise in raw material and fuel prices had a negative impact on Toray Group's profit.

Under such circumstances, Toray Group, since April, 2017, has been working on the medium-term management program "Project AP-G 2019" that spans over three years through fiscal year 2019 and has been implementing the growth strategy with focus on taking advantage of growth business fields, pursuing business expansion in growth countries and regions as well as further bolstering its cost competitiveness.

INCOME ANALYSIS

Net Sales

Net sales for the year ended March 31, 2019 were in ¥2,388.8 billion, up by ¥184.0 billion (8.3%) from the previous year. Regarding the sales by business segment, net sales in the Fibers & Textiles, Performance Chemicals, Carbon Fiber Composite Materials, Environment & Engineering and Others segments increased, while those in the Life Science segment decreased.

Costs and Expenses

The ratio of total costs and expenses to net sales for the year ended March 31, 2019 was 94.1%, up 1.2 percentage points year on year.

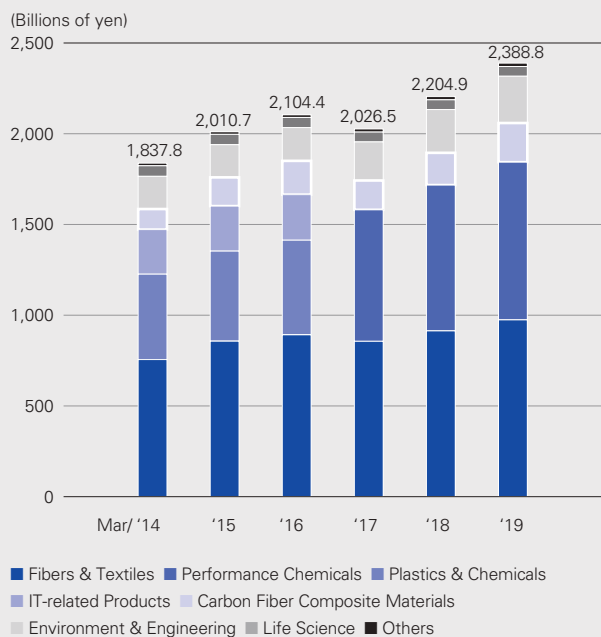
Net sales and the cost of sales increased from the previous year by 8.3% and 10.7%, respectively. As a result, the cost of sales ratio rose by 1.7 percentage points to 81.0%.

Selling, general and administrative expenses increased by ¥11.5 billion (3.8%) to ¥311.9 billion. The ratio of selling, general and administrative expenses to net sales declined by 0.6 percentage points to 13.1%.

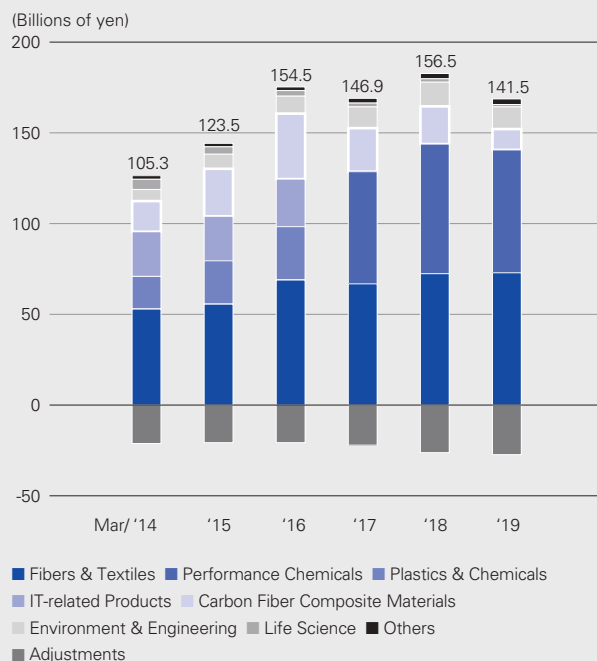
R&D expenses increased by ¥0.1 billion (0.2%) to ¥66.4 billion.

DATA

Net Sales by Segment



Operating Income by Segment



*1 Toray Group changed the reportable segments effective from the year ended March 31, 2018. The related figures for the year ended March 31, 2017 are retrospectively restated accordingly.

*2 Operating income by segment that is not attributable to any segment is included in "Adjustments."

Operating Income and Net Income

Operating income fell by ¥15.0 billion (9.6%) year on year to ¥141.5 billion. The ratio of operating income to net sales declined by 1.2 percentage points to 5.9%. Operating income by business segment increased in the Fibers & Textiles and Others segments while decreasing in the Performance Chemicals, Carbon Fiber Composite Materials, Environment & Engineering, and Life Science segments.

In net other income (expenses), Toray Group reported net expenses of ¥14.1 billion in the year ended March 31, 2019, down by ¥5.8 billion (29.2%) from the previous year. Interest and dividend income increased by ¥1.7 billion (31.8%) to ¥6.9 billion, and interest expenses also climbed by ¥2.1 billion (40.7%). As a result, net financial expense of ¥0.3 billion was recorded in the year ended March 31, 2019, down ¥0.4 billion compared with the previous year. Equity in earnings of unconsolidated subsidiaries and affiliated companies rose by ¥0.4 billion (4.3%) year on year to ¥9.6 billion. Net gain on sales and disposal of property, plant and equipment came to ¥9.8 billion, a turnaround of ¥16.8 billion from the loss recorded in the previous year. Loss on impairment of fixed assets increased by ¥14.5 billion (366.9%) to ¥18.4 billion. Net loss on sales and loss on write-down of investment securities deteriorated by ¥4.1 billion year on year to ¥0.7 billion. In the year ended March 31, 2019, the Group posted a gain on return of assets from retirement benefit trust of ¥2.5 billion.

As a result of the aforementioned, income before income taxes declined by ¥9.2 billion (6.7%) year on year to ¥127.4 billion. After deductions for income taxes and net income attributable to non-controlling interests, net income attributable to owners of parent amounted to ¥79.4 billion, down ¥16.5 billion (17.2%) year on year.

Net income per share was ¥49.61, a decrease of ¥10.4. In light of profit conditions for the year ended March 31, 2019 and outlook for the next year, the total annual dividend for the year ended March 31, 2019 was set at ¥16.00 per share. This comprised an interim cash dividend of ¥8.00 per share and a year-end cash dividend of ¥8.00 per share.

Business Performance by Segment

Fibers & Textiles

In Japan, demand for industrial applications such as automobiles was strong in general, while shipment of apparel applications remained weak partly due to the unseasonable weather. Against this background, Toray Group not only strived to expand sales in each application but also worked to expand the business format that integrates fibers to textiles to final products while focusing on strengthening cost competitiveness.

Overseas, business performance of some subsidiaries in Southeast Asia remained slow, and was affected by a slowdown in demand for materials for automotive and other applications from the second half of the fiscal year, reflecting the deceleration of the Chinese economy. The Group expanded the integrated business for apparel applications.

The segment's business both in Japan and abroad was generally affected by the increase in raw material prices.

As a result, overall sales of Fibers & Textiles segment increased 6.6% to ¥974.3 billion from the previous year and operating income rose 0.6% to ¥72.9 billion.

Performance Chemicals

In the resins business, Toray Group expanded sales of automotive applications while passing on the rise in raw material prices to the sales price, but the business was affected by the economic slowdown in China. The chemicals business saw an improvement in the basic chemicals market and sales of fine chemical products also increased. In the films business, shipment of battery separator films for lithium-ion secondary batteries increased reflecting demand growth, while polyester films and other products were broadly affected by the increase in raw material prices. The electronic & information materials business was affected by the slowing demand in the smartphone market.

As a result, overall sales of Performance Chemicals segment increased 8.2% to ¥868.8 billion from the previous year. Operating income declined 5.1% to ¥67.7 billion.

Carbon Fiber Composite Materials

In the Carbon Fiber Composite Materials segment, demand for aircraft applications was mostly strong given the completion of the inventory adjustment in the supply chain. Demand for industrial applications showed a recovery trend for the most part, primarily in the environment and energy-related fields led by compressed natural gas tank applications and wind turbine blade applications.

However, the segment was affected by rising raw material prices and intensifying competition. The cost of starting a new project at a composite subsidiary overseas increased and the segment also incurred fees related to the acquisition of the entire stake in TenCate Advanced Composites Holding B.V.

As a result, overall sales of Carbon Fiber Composite Materials segment increased 21.3% to ¥215.9 billion from the previous year while operating income fell 44.4% to ¥11.5 billion.

Environment & Engineering

In the water treatment business, demand for reverse osmosis membranes and other products grew strongly on the whole in Japan and abroad. Among domestic subsidiaries in the segment, the trading volume of a trading subsidiary increased, while an engineering subsidiary outside Japan was affected by the conclusion of a large-scale plant construction project.

As a result, overall sales of Environment & Engineering segment increased 8.1% to ¥257.7 billion from the previous year while operating income declined 7.9% to ¥12.2 billion.

Life Science

In the pharmaceutical business, while sales volume of orally active prostacyclin derivative DORNER® increased in the overseas markets, the sales were affected by its generic versions and the revision of National Health Insurance drug price standards in Japan. Sales of pruritus treatment REMITCH®* were influenced by the market entry of its generic versions.

The medical devices business was affected by the reduction of the insurance reimbursement amount in Japan and the increase in raw material prices, while shipment of dialyzers grew strongly in Japan and overseas and sales volume of dialysis machines also expanded.

As a result, overall sales of Life Science segment declined 0.3% to ¥53.7 billion from the previous year and operating income fell 33.0% to ¥1.3 billion.

*REMITCH® is a registered trademark of Torii Pharmaceutical Co., Ltd.

Others

Net sales increased by ¥0.6 billion (3.2%) from the previous year to ¥18.5 billion, and operating income as well increased by ¥0.2 billion (6.5%) to ¥3.1 billion.

FINANCIAL POSITION

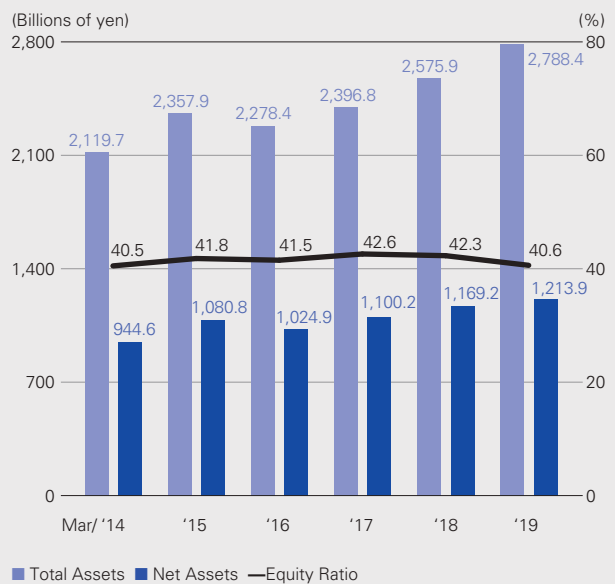
Toray Group adopted "Partial Amendments to Accounting Standard for Tax Effect Accounting" (ASBJ Statement No. 28, February 16, 2018) effective from the year ended March 31, 2019. The following analysis of financial position bases on the accordingly restated figures for the year ended March 31, 2018.

Analysis of Assets, Liabilities and Net Assets

As of March 31, 2019, Toray Group's total assets stood at ¥2,788.4 billion, up ¥212.4 billion from the end of the previous year. Current assets rose ¥64.3 billion as trade notes and accounts receivable increased, while noncurrent assets expanded ¥148.1 billion due to increases in property, plant and equipment and intangible assets.

Total liabilities rose ¥167.7 billion from the end of the previous year to ¥1,574.4 billion, due primarily to an increase in interest-bearing debts.

Total Assets and Net Assets



*"Partial Amendments to Accounting Standard for Tax Effect Accounting" (ASBJ Statement No. 28, February 16, 2018) is applied from the year ended March 31, 2019 and onward. The related figures for the year ended March 31, 2018 are retrospectively restated accordingly.

Net assets expanded by ¥44.8 billion compared with the end of the previous year to ¥1,213.9 billion, reflecting an increase in retained earnings due to recognition of net income for the year. Net assets less non-controlling interests and stock acquisition rights stood at ¥1,131.0 billion. The equity ratio at the end of the year came to 40.6%, a 1.8 percentage-point decrease compared with the level at the end of the previous year.

CASH FLOWS

For the year ended March 31, 2019, net cash used in investing activities exceeded net cash provided by operating activities by ¥84.0 billion. Meanwhile, net cash provided by financing activities came to ¥118.9 billion owing mainly to the increase in interest-bearing liabilities. As a result, after counting exchange rate changes and cash and cash equivalents at subsidiaries not previously included in consolidation, cash and cash equivalents as of March 31, 2019 amounted to ¥173.1 billion, up by ¥38.8 billion (28.9%) compared with the end of the previous year on a consolidated basis.

Cash Flows from Operating Activities

Net cash provided by operating activities increased by ¥47.1 billion (36.4%) compared with the previous year to ¥176.2 billion.

Looking at major movements, the increase in trade receivables was held to ¥33.6 billion compared with ¥62.0 billion in the previous year. In the year ended March 31, 2019, the Group reported a decrease in inventories of ¥28.4 billion compared with an increase of ¥31.5 billion for the previous year and a decrease in trade payables of ¥11.8 billion compared with an increase of ¥11.6 billion in the previous year.

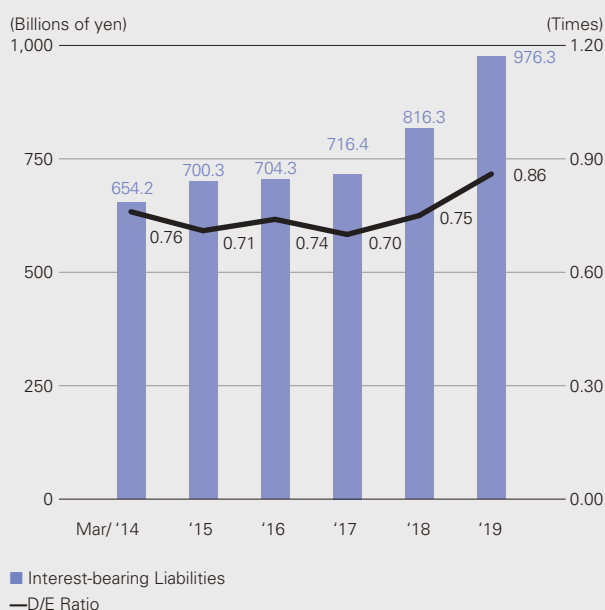
Cash Flows from Investing Activities

Net cash used in investing activities totaled ¥260.2 billion, up ¥73.6 billion (39.4%) compared with the previous year. This largely reflected payments for the purchase of shares in subsidiary companies that resulted in a change in the scope of consolidation of ¥114.6 billion compared with ¥2.7 billion for the previous year.

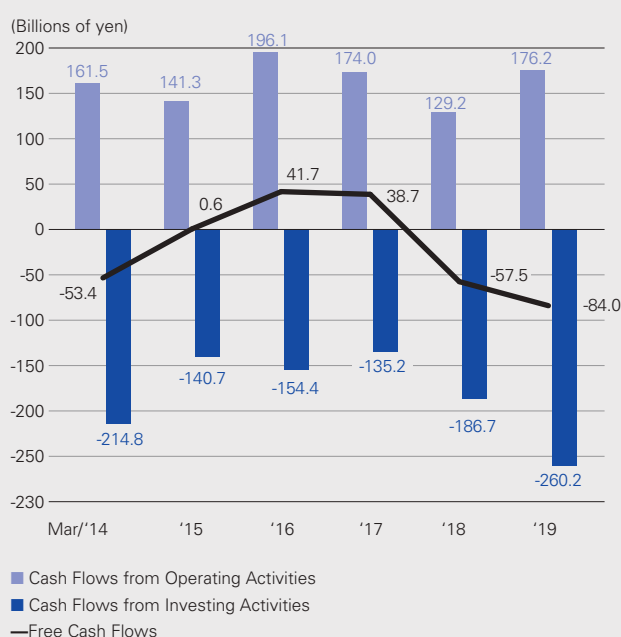
Cash Flows from Financing Activities

Net cash provided by financing activities came to ¥118.9 billion, up by ¥57.1 billion compared with the previous year. Major cash-decreasing factors included a net decrease in short-term debt of ¥18.6 billion compared with a net increase of ¥30.5 billion for the previous year and repayment of long-term debt of ¥66.8 billion, down by ¥44.6 billion from the previous year. The major cash-increasing factor, on the other hand, was proceeds from long-term debt of ¥234.5 billion, up by ¥55.6 billion year on year.

Interest-bearing Liabilities and D/E Ratio



Cash Flows



Consolidated Balance Sheets

Toray Industries, Inc. and Consolidated Subsidiaries
March 31, 2019 and 2018

Assets	Millions of yen		Thousands of U.S. dollars (Note 2)
	2019	2018	2019
Current assets:			
Cash (Note 5)	¥ 140,701	¥ 108,379	\$ 1,267,577
Time deposits (Notes 4 and 5)	27,806	32,722	250,505
Trade receivables (Notes 5 and 7):			
Notes receivable	56,346	55,499	507,622
Accounts receivable	474,712	434,050	4,276,685
Inventories (Note 3)	419,527	439,673	3,779,523
Prepaid expenses and other current assets (Notes 5 and 6)	74,517	58,739	671,324
Allowance for doubtful accounts	(2,280)	(2,037)	(20,541)
Total current assets	1,191,329	1,127,025	10,732,694
Property, plant and equipment (Notes 4 and 13):			
Land	77,687	78,370	699,883
Buildings	651,084	631,681	5,865,622
Machinery and equipment	1,989,553	1,902,003	17,923,901
Construction in progress	143,847	120,514	1,295,919
Other	121,512	115,121	1,094,703
	2,983,683	2,847,689	26,880,027
Accumulated depreciation	(1,986,807)	(1,920,660)	(17,899,162)
Property, plant and equipment, net	996,876	927,029	8,980,865
Intangible assets (Note 13):			
Goodwill	85,712	40,146	772,180
Other	85,537	28,501	770,604
Total intangible assets	171,249	68,647	1,542,784
Investments and other assets:			
Investments in unconsolidated subsidiaries and affiliated companies (Note 5)	163,052	172,315	1,468,937
Investment securities (Notes 4, 5 and 6)	188,000	201,314	1,693,694
Long-term loans receivable	2,477	1,447	22,315
Deferred tax assets (Note 10)	21,978	21,539	198,000
Other (Notes 4 and 8)	56,171	59,555	506,045
Allowance for doubtful accounts	(2,781)	(2,961)	(25,054)
Total investments and other assets	428,897	453,209	3,863,937
Total assets	¥ 2,788,351	¥ 2,575,910	\$ 25,120,279

See accompanying notes to consolidated financial statements.

Liabilities and Net Assets	Millions of yen		Thousands of U.S. dollars (Note 2)
	2019	2018	2019
Current liabilities:			
Short-term bank loans (Notes 4 and 5)	¥ 175,567	¥ 135,936	\$ 1,581,685
Current portion of long-term debt (Notes 4, 5 and 7)	94,094	63,203	847,694
Commercial paper (Note 5)	—	46,000	—
Trade payables (Notes 5 and 7):			
Notes payable	38,824	38,433	349,766
Accounts payable	201,730	207,117	1,817,387
Income taxes payable (Note 10)	13,578	13,966	122,324
Accrued liabilities	64,850	62,363	584,234
Other current liabilities (Note 4)	107,850	109,478	971,622
Total current liabilities	696,493	676,496	6,274,712
Non-current liabilities:			
Long-term debt (Notes 4, 5 and 7)	702,761	567,657	6,331,180
Deferred tax liabilities (Note 10)	48,758	31,387	439,261
Net defined benefit liability (Note 8)	100,730	101,786	907,477
Other non-current liabilities (Note 4)	25,665	29,396	231,216
Total non-current liabilities	877,914	730,226	7,909,135
Total liabilities	1,574,407	1,406,722	14,183,847
Net assets (Note 11):			
Stockholders' equity:			
Common stock:			
Authorized—4,000,000,000 shares	147,873	147,873	1,332,189
Issued—1,631,481,403 shares			
Capital surplus	117,760	117,572	1,060,901
Retained earnings	817,263	763,504	7,362,730
Treasury stock, at cost	(20,358)	(20,631)	(183,405)
Total stockholders' equity	1,062,538	1,008,318	9,572,414
Accumulated other comprehensive income:			
Net unrealized gains (losses) on securities	64,662	74,290	582,541
Net deferred gains (losses) on hedges	75	(901)	676
Foreign currency translation adjustments	896	4,830	8,072
Remeasurements of defined benefit plans	2,862	4,158	25,784
Total accumulated other comprehensive income	68,495	82,377	617,072
Stock acquisition rights (Note 9)	1,338	1,334	12,054
Non-controlling interests	81,573	77,159	734,892
Total net assets	1,213,944	1,169,188	10,936,432
Total liabilities and net assets	¥ 2,788,351	¥ 2,575,910	\$ 25,120,279

DATA

Consolidated Statements of Income

Toray Industries, Inc. and Consolidated Subsidiaries
Years ended March 31, 2019 and 2018

	Millions of yen		Thousands of U.S. dollars (Note 2)
	2019	2018	2019
Net sales	¥ 2,388,848	¥ 2,204,858	\$ 21,521,153
Costs and expenses:			
Cost of sales (Notes 3, 8, 13 and 14)	1,935,486	1,748,017	17,436,811
Selling, general and administrative expenses (Notes 8, 9, 13 and 14)	311,893	300,377	2,809,847
	2,247,379	2,048,394	20,246,658
Operating income	141,469	156,464	1,274,495
Other income (expenses):			
Interest expenses	(7,161)	(5,091)	(64,514)
Interest and dividend income	6,883	5,222	62,009
Equity in earnings of unconsolidated subsidiaries and affiliated companies	9,619	9,221	86,658
Gain (loss) on sales and disposal of property, plant and equipment, net	9,751	(7,084)	87,847
Loss on impairment of fixed assets (Note 15)	(18,414)	(3,944)	(165,892)
Gain (loss) on sales and loss on write-down of investment securities, net	(625)	3,445	(5,631)
Loss on liquidation and devaluation of subsidiaries and affiliated companies	(673)	(3,591)	(6,063)
Gain on return of assets from retirement benefits trust	2,532	—	22,811
Environmental expenses	—	(2,597)	—
Settlement package	(864)	—	(7,784)
Other, net	(15,098)	(15,433)	(136,018)
	(14,050)	(19,852)	(126,577)
Income before income taxes	127,419	136,612	1,147,919
Income taxes (Note 10):			
Current	37,293	34,851	335,973
Deferred	2,338	(1,419)	21,063
	39,631	33,432	357,036
Net income	87,788	103,180	790,883
Net income attributable to non-controlling interests	8,415	7,265	75,811
Net income attributable to owners of parent	¥ 79,373	¥ 95,915	\$ 715,072

See accompanying notes to consolidated financial statements.

Consolidated Statements of Comprehensive Income

Toray Industries, Inc. and Consolidated Subsidiaries
Years ended March 31, 2019 and 2018

	Millions of yen		Thousands of U.S. dollars (Note 2)
	2019	2018	2019
Net income	¥ 87,788	¥ 103,180	\$ 790,883
Other comprehensive income (Note 16)			
Net unrealized gains (losses) on securities	(9,579)	8,100	(86,297)
Net deferred gains (losses) on hedges	1,064	(997)	9,586
Foreign currency translation adjustments	(4,767)	(5,820)	(42,946)
Remeasurements of defined benefit plans	(1,325)	2,635	(11,937)
Share of other comprehensive income of unconsolidated subsidiaries and affiliated companies accounted for by the equity method	(605)	(1,770)	(5,450)
Total other comprehensive income	(15,212)	2,148	(137,045)
Comprehensive income	¥ 72,576	¥ 105,328	\$ 653,838
Total comprehensive income attributable to:			
Owners of parent	¥ 65,491	¥ 96,452	\$ 590,009
Non-controlling interests	7,085	8,876	63,829

See accompanying notes to consolidated financial statements.

Consolidated Statements of Changes in Net Assets

Toray Industries, Inc. and Consolidated Subsidiaries
Years ended March 31, 2019 and 2018

	Millions of yen												
	Stockholders' equity					Accumulated other comprehensive income							
	Common stock	Capital surplus	Retained earnings	Treasury stock, at cost	Total stockholders' equity	Net unrealized gains (losses) on securities	Net deferred gains (losses) on hedges	Foreign currency translation adjustments	Remeasurements of defined benefit plans	Total accumulated other comprehensive income	Stock acquisition rights	Non-controlling interests	Total net assets
Balance as of April 1, 2017	¥ 147,873	¥ 121,091	¥ 691,290	¥ (20,822)	¥ 939,432	¥ 66,513	¥ 21	¥ 13,764	¥ 1,542	¥ 81,840	¥ 1,205	¥ 77,699	¥ 1,100,176
Changes in:													
Dividends			(22,402)		(22,402)								(22,402)
Net income attributable to owners of parent			95,915		95,915								95,915
Purchase of treasury stock				(3)	(3)								(3)
Disposition of treasury stock		2		194	196								196
Change in equity attributable to parent arising from transaction with non-controlling shareholders		(3,521)			(3,521)								(3,521)
Other			(1,299)		(1,299)								(1,299)
Items other than stockholders' equity, net						7,777	(922)	(8,934)	2,616	537	129	(540)	126
Total changes	—	(3,519)	72,214	191	68,886	7,777	(922)	(8,934)	2,616	537	129	(540)	69,012
Balance as of March 31, 2018	¥ 147,873	¥ 117,572	¥ 763,504	¥ (20,631)	¥ 1,008,318	¥ 74,290	¥ (901)	¥ 4,830	¥ 4,158	¥ 82,377	¥ 1,334	¥ 77,159	¥ 1,169,188
Balance as of April 1, 2018	¥ 147,873	¥ 117,572	¥ 763,504	¥ (20,631)	¥ 1,008,318	¥ 74,290	¥ (901)	¥ 4,830	¥ 4,158	¥ 82,377	¥ 1,334	¥ 77,159	¥ 1,169,188
Changes in:													
Dividends			(25,608)		(25,608)								(25,608)
Net income attributable to owners of parent			79,373		79,373								79,373
Purchase of treasury stock				(2)	(2)								(2)
Disposition of treasury stock		14		273	287								287
Change in equity attributable to parent arising from transaction with non-controlling shareholders		174			174								174
Other			(6)	2	(4)								(4)
Items other than stockholders' equity, net						(9,628)	976	(3,934)	(1,296)	(13,882)	4	4,414	(9,464)
Total changes	—	188	53,759	273	54,220	(9,628)	976	(3,934)	(1,296)	(13,882)	4	4,414	44,756
Balance as of March 31, 2019	¥ 147,873	¥ 117,760	¥ 817,263	¥ (20,358)	¥ 1,062,538	¥ 64,662	¥ 75	¥ 896	¥ 2,862	¥ 68,495	¥ 1,338	¥ 81,573	¥ 1,213,944

	Thousands of U.S. dollars (Note 2)												
	Stockholders' equity					Accumulated other comprehensive income							
	Common stock	Capital surplus	Retained earnings	Treasury stock, at cost	Total stockholders' equity	Net unrealized gains (losses) on securities	Net deferred gains (losses) on hedges	Foreign currency translation adjustments	Remeasurements of defined benefit plans	Total accumulated other comprehensive income	Stock acquisition rights	Non-controlling interests	Total net assets
Balance as of April 1, 2018	\$ 1,332,189	\$ 1,059,207	\$ 6,878,414	\$ (185,865)	\$ 9,083,946	\$ 669,279	\$ (8,117)	\$ 43,514	\$ 37,459	\$ 742,135	\$ 12,018	\$ 695,126	\$ 10,533,225
Changes in:													
Dividends			(230,703)		(230,703)								(230,703)
Net income attributable to owners of parent			715,072		715,072								715,072
Purchase of treasury stock				(18)	(18)								(18)
Disposition of treasury stock		126		2,459	2,586								2,586
Change in equity attributable to parent arising from transaction with non-controlling shareholders		1,568			1,568								1,568
Other			(54)	18	(36)								(36)
Items other than stockholders' equity, net						(86,739)	8,793	(35,441)	(11,676)	(125,063)	36	39,766	(85,261)
Total changes	—	1,694	484,315	2,459	488,468	(86,739)	8,793	(35,441)	(11,676)	(125,063)	36	39,766	403,207
Balance as of March 31, 2019	\$ 1,332,189	\$ 1,060,901	\$ 7,362,730	\$ (183,405)	\$ 9,572,414	\$ 582,541	\$ 676	\$ 8,072	\$ 25,784	\$ 617,072	\$ 12,054	\$ 734,892	\$ 10,936,432

See accompanying notes to consolidated financial statements.

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Consolidated Statements of Cash Flows

Toray Industries, Inc. and Consolidated Subsidiaries
Years ended March 31, 2019 and 2018

	Millions of yen		Thousands of U.S. dollars (Note 2)
	2019	2018	2019
Cash flows from operating activities:			
Income before income taxes	¥ 127,419	¥ 136,612	\$ 1,147,919
Adjustments to reconcile income before income taxes to net cash provided by operating activities:			
Depreciation and amortization	101,711	95,815	916,315
Loss on impairment of fixed assets	18,414	3,944	165,892
Interest and dividend income	(6,883)	(5,222)	(62,009)
Equity in earnings of unconsolidated subsidiaries and affiliated companies	(9,619)	(9,221)	(86,658)
Interest expenses	7,161	5,091	64,514
Loss (gain) on sales and disposal of property, plant and equipment, net	(9,751)	7,084	(87,847)
Loss (gain) on sales and write-down of investment securities, net	666	(3,239)	6,000
Increase (decrease) in net defined benefit liability	(1,451)	193	(13,072)
Decrease (increase) in trade receivables	(33,582)	(61,969)	(302,541)
Decrease (increase) in inventories	28,427	(31,492)	256,099
Increase (decrease) in trade payables	(11,843)	11,594	(106,694)
Other, net	(464)	3,271	(4,180)
Subtotal	210,205	152,461	1,893,739
Interest and dividends received	15,704	16,111	141,477
Interest paid	(7,098)	(5,052)	(63,946)
Income taxes paid	(42,572)	(34,340)	(383,532)
Net cash provided by operating activities	176,239	129,180	1,587,739
Cash flows from investing activities:			
Capital expenditures	(169,630)	(147,925)	(1,528,198)
Purchase of investment securities	(4,131)	(67,274)	(37,216)
Proceeds from sales of property, plant and equipment	19,254	2,996	173,459
Proceeds from sales of investment securities	8,387	13,421	75,559
Acquisition of shares of consolidated subsidiaries resulting in change in scope of consolidation (Note 18)	(114,564)	(2,654)	(1,032,108)
Other, net	437	14,751	3,937
Net cash used in investing activities	(260,247)	(186,685)	(2,344,568)
Cash flows from financing activities:			
Net increase (decrease) in short-term debt	(18,596)	30,520	(167,532)
Proceeds from long-term debt	234,530	178,912	2,112,883
Repayment of long-term debt	(66,843)	(111,446)	(602,189)
Cash dividends paid	(29,875)	(24,439)	(269,144)
Payments from changes in ownership interests in subsidiaries that do not result in change in scope of consolidation	(344)	(10,480)	(3,099)
Other, net	19	(1,294)	171
Net cash provided by (used in) financing activities	118,891	61,773	1,071,090
Effect of exchange rate changes on cash and cash equivalents	(327)	(1,924)	(2,946)
Net increase (decrease) in cash and cash equivalents	34,556	2,344	311,315
Cash and cash equivalents at beginning of year	134,315	131,405	1,210,045
Beginning balance of cash and cash equivalents at subsidiaries not previously included in consolidation	4,207	566	37,901
Cash and cash equivalents at end of year	¥ 173,078	¥ 134,315	\$ 1,559,261

See accompanying notes to consolidated financial statements.

Notes to Consolidated Financial Statements

Toray Industries, Inc. and Consolidated Subsidiaries
Years ended March 31, 2019 and 2018

1. SIGNIFICANT ACCOUNTING POLICIES

a) Basis of Presenting Consolidated Financial Statements

The accompanying consolidated financial statements of Toray Industries, Inc. (the Company) and its consolidated subsidiaries have been prepared in accordance with the provisions set forth in the Financial Instruments and Exchange Act of Japan and its related accounting regulations, and in conformity with accounting principles and practices generally accepted in Japan, which are different in certain respects as to application and disclosure requirements of International Financial Reporting Standards.

For the preparation of consolidated financial statements, the accounting policies and procedures applied to a parent company and its subsidiaries for similar transactions and events under similar circumstances should be unified, in principle. However, financial statements prepared by overseas subsidiaries in accordance with International Financial Reporting Standards or the generally accepted accounting principles in the United States tentatively may be used for the consolidation process. In addition, some items should be adjusted in the consolidation process so that net income is accurately accounted for, unless they are not material.

Certain items presented in the original consolidated financial statements in Japanese have been reclassified for the convenience of readers outside Japan.

b) Principles of Consolidation

The accompanying consolidated financial statements include the accounts of the Company and substantially all of its subsidiaries.

Assets and liabilities of the consolidated subsidiaries are revalued to fair market value when the Company acquires control over the subsidiaries.

Investments in unconsolidated subsidiaries and affiliated companies are accounted for by the equity method.

All intercompany accounts and transactions have been eliminated in consolidation. The difference between the acquisition cost and the underlying net assets of the subsidiaries is recognized as goodwill and amortized principally over its estimated useful life not exceeding twenty years on a straight-line method.

c) Cash and Cash Equivalents

Cash and cash equivalents at March 31, 2019 and 2018 include cash, short-term time deposits which may be withdrawn on demand without diminution of principal and highly liquid investments with original maturities of three months or less.

Cash and cash equivalents consisted of:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Cash	¥140,701	¥108,379	\$1,267,577
Time deposits	27,806	32,722	250,505
Less—Time deposits with maturities of over 3 months	(2,841)	(6,786)	(25,595)
Marketable securities with original maturities of 3 months or less	7,412	—	66,775
Cash and cash equivalents	¥173,078	¥134,315	\$1,559,261

d) Financial Instruments

Derivatives:

All derivatives are stated at fair value, with changes in fair value included in net income or loss for the period in which they arise, except for derivatives that are designated as “hedging instruments” (see Hedge Accounting below).

Securities:

Held-to-maturity debt securities that the Company and its consolidated subsidiaries have the intent to hold to maturity, are stated at cost after accounting for premium or discount on acquisition, which are amortized over the period to maturity.

Other securities for which market quotations are available are stated at fair value. Net unrealized gains or losses on these securities are reported as a separate item in net assets at a net-of-tax amount.

Other securities for which market quotations are unavailable are stated at cost, except as stated in the paragraph below.

In cases where the fair value of held-to-maturity debt securities or other securities has declined significantly and such impairment of the value is not deemed temporary, those securities are written down to fair value and the resulting losses are included in net income or loss for the period.

Hedge Accounting:

Gains or losses arising from changes in fair value of derivatives designated as “hedging instruments” are deferred as a separate item of net assets at a net-of-tax amount and included in net income or loss in the same period during which the gains and losses on the hedged items or transactions are recognized.

The derivatives designated as hedging instruments by the Company and its consolidated subsidiaries are principally interest rate swaps and forward foreign exchange contracts. The related hedged items are trade accounts receivable and payable, long-term bank loans and debt securities issued by the Company and its consolidated subsidiaries.

The Company and its consolidated subsidiaries have a policy to utilize the above hedging instruments in order to reduce their exposure to the risk of interest rate and foreign currency fluctuations. Thus, their purchase of the hedging instruments are limited to, at maximum, the amounts of the hedged items.

The Company and its consolidated subsidiaries evaluate the effectiveness of hedging activities by reference to the accumulated gains or losses on the hedging instruments and the related hedged items from the commencement of the hedges.

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e) Allowance for Doubtful Accounts

In the Company and its domestic consolidated subsidiaries, an allowance for doubtful accounts, including receivables and loans, is determined from the amounts considered unlikely to be recovered, estimated from past actual bad debt ratio records for general receivables and from studying the probability of recovery in individual cases where there is concern over claims.

f) Inventories

Inventories are stated at the lower of acquisition cost, principally determined by the moving average method, or net selling value to reflect any decreased profitability of inventories.

g) Property, Plant and Equipment

Property, plant and equipment are stated at cost.

Depreciation for property, plant and equipment (except leased assets) is principally computed by the straight-line method at rates based on estimated useful lives that are as follows:

Buildings	3–60 years
Machinery and equipment	3–15 years

Principally, a depreciation method of leased assets is identical to the method applicable to its own fixed assets.

h) Income Taxes

Income taxes of the Company and its domestic consolidated subsidiaries consist of corporate income taxes, local inhabitants taxes and enterprise taxes. Deferred income taxes are determined using the asset and liability approach, where deferred tax assets and liabilities are recognized for temporary differences between the tax basis of assets and liabilities and their reported amount in the financial statements. The Company also provides for the anticipated tax effect of future remittances of retained earnings from subsidiaries and affiliated companies.

The Company and some of its consolidated subsidiaries file consolidated tax returns in their respective countries.

i) Consumption Taxes

Transactions subject to consumption taxes are recorded at amounts exclusive of consumption taxes.

j) Retirement Benefits

The Company and some of its consolidated subsidiaries have unfunded lump-sum benefit plans, funded contributory pension plans and/or defined contribution pension plans covering eligible employees.

Under the terms of the unfunded lump-sum benefit plans, eligible employees are entitled under most circumstances, upon mandatory retirement or earlier voluntary severance, to indemnities based on compensation at the time of severance and years of service.

The funded contributory pension plans and the defined contribution pension plans provide, in general, pension payments for life commencing from age 60.

To provide for the payment of retirement benefits to employees, net defined benefit liability is recognized at an amount equal to the expected retirement benefit obligations net of the fair value of pension assets at the end of the period.

Past service cost is amortized as incurred using the straight-line method over a certain period within the employees' average remaining years of service (primarily 12 years).

Actuarial gains and losses are amortized from the following fiscal year after recognition using the straight-line method over a certain period within the employees' average remaining years of service (primarily 12 years).

Unrecognized actuarial gains and losses and unrecognized past service cost are recognized in remeasurements of defined benefit plans in accumulated other comprehensive income under the net assets section, net of deferred taxes.

An allowance is separately provided against retirement benefits for the members of the boards of some consolidated subsidiaries and is included in "other non-current liabilities" on the consolidated balance sheets. The amount is calculated based on the internal company policies as the estimated amount that would be payable if all such board members were to retire at the balance sheet date.

k) Appropriation of Retained Earnings

Cash dividends are recorded in the fiscal year when the proposed appropriation of retained earnings is approved by the Board of Directors and/or stockholders.

l) Foreign Currency Transactions

All monetary assets and liabilities denominated in foreign currencies, whether long-term or short-term, are translated into Japanese yen at the exchange rates prevailing at the balance sheet date. Resulting gains and losses are included in net income or loss for the period.

m) Translation of Foreign Currency Financial Statements

Translation of foreign currency financial statements of overseas subsidiaries into Japanese yen for consolidation purposes is made by using the current exchange rates prevailing at their balance sheet dates, with the exception that the translation of stockholders' equity is made by using historical rates. Revenue and expense accounts are principally translated at the average exchange rates during the year. Differences in yen amounts arising from the use of different rates are presented as "foreign currency translation adjustments" in net assets except for the portion belonging to non-controlling shareholders, which is included in "non-controlling interests" in net assets.

n) Standards Issued but Not Yet Adopted**Accounting Standard and Implementation Guidance on Revenue Recognition**

On March 30, 2018, the Accounting Standards Board of Japan (ASBJ) issued "Accounting Standard for Revenue Recognition" (ASBJ Statement No. 29) and "Implementation Guidance on Accounting Standard for Revenue Recognition" (ASBJ Guidance No. 30).

(1) Overview

This is a comprehensive accounting standard for revenue recognition. The standard establishes the following five-step model that an entity applies when recognizing revenue from customers:

- Step 1: Identify the contract(s) with a customer.
- Step 2: Identify the performance obligations in the contract.
- Step 3: Determine the transaction price.
- Step 4: Allocate the transaction price to the performance obligations in the contract.
- Step 5: Recognize revenue when (or as) the entity satisfies a performance obligation.

(2) Scheduled Date of Adoption

The Company is currently deciding the date of adopting this accounting standard and implementation guidance.

(3) Impact of Adoption

The Company is currently evaluating the effect of adopting this accounting standard and implementation guidance on its consolidated financial statements.

Leases (IFRS 16)**(1) Overview**

This accounting standard primarily requires that lessees recognize right-of-use assets and lease liabilities for basically all leases.

(2) Scheduled Date of Adoption

Subsidiaries outside of Japan are going to adopt this standard starting from the beginning of the year ending March 31, 2020.

(3) Impact of Adoption

The Company is currently evaluating the effect of adopting this accounting standard on its consolidated financial statements.

o) Changes in Presentation**Partial Amendments to Accounting Standard for Tax Effect Accounting**

The Company and its consolidated subsidiaries have adopted "Partial Amendments to Accounting Standard for Tax Effect Accounting" (ASBJ Statement No. 28, February 16, 2018) (the Partial Amendments) from the beginning of the year ended March 31, 2019. As such, deferred tax assets and deferred tax liabilities are included within investments and other assets and non-current liabilities, respectively.

As a result, ¥25,641 million of deferred tax assets in current assets and ¥30 million of deferred tax liabilities in other current liabilities previously presented in the consolidated balance sheet as of March 31, 2018 are reclassified and included in deferred tax assets in investments and other assets and deferred tax liabilities in non-current liabilities, respectively.

Since the Company and its consolidated subsidiaries offset deferred tax assets and deferred tax liabilities of the same taxable entity, total assets as of March 31, 2018 decreased by ¥17,004 million.

Also, Note 10. INCOME TAXES in the Notes to the Consolidated Financial Statements is expanded in accordance with Articles 3, 4 and 5 of the Partial Amendments. However, comparative information for the year ended March 31, 2018 is not provided in Note 10 in accordance with the transitional provisions set forth in Article 7 of the Partial Amendments.

2. U.S. DOLLAR AMOUNTS

The Company and its domestic consolidated subsidiaries maintain their accounting records in yen. The U.S. dollar amounts included in the accompanying consolidated financial statements and notes thereto represent the arithmetic results of translating yen into U.S. dollars at the rate of ¥111.0 to \$1.00, the approximate exchange

rate prevailing on March 31, 2019. The inclusion of such U.S. dollar amounts is solely for the convenience of readers outside Japan and is not intended to imply that the assets and liabilities that originated in yen have been or could be readily converted, realized or settled in U.S. dollars at this or at any other rate.

3. INVENTORIES

At March 31, 2019 and 2018, inventories consisted of the following:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Merchandise and finished goods	¥ 228,480	¥ 248,513	\$ 2,058,378
Work in process	85,880	92,501	773,694
Raw materials and supplies	105,167	98,659	947,450
	¥ 419,527	¥ 439,673	\$ 3,779,523

Losses recognized and charged to cost of sales as a result of valuation at March 31, 2019 and 2018 were ¥4,502 million (\$40,559 thousand) and ¥2,578 million, respectively.

4. SHORT-TERM BANK LOANS, LONG-TERM DEBT AND LEASE OBLIGATIONS

Short-term bank loans at March 31, 2019 and 2018 represented bank overdrafts and short-term notes. The Company is not required to pay commitment fees on unused balances of the bank overdraft agreements.

Long-term debt and lease obligations at March 31, 2019 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Loans principally from banks and insurance companies with interest rates primarily from 0.00% to 11.50%, maturing serially through 2029:			
Unsecured	¥ 456,402	¥ 388,821	\$ 4,111,730
Secured	453	546	4,081
Lease obligations maturing serially through 2036:			
Unsecured	3,829	3,529	34,495
Yen notes with an interest rate of 0.96% due 2018	—	4	—
Yen notes with an interest rate of 0.93% due 2022	20,000	20,000	180,180
Yen notes with an interest rate of 1.01% due 2023	20,000	20,000	180,180
Yen notes with an interest rate of 0.25% due 2024	40,000	40,000	360,360
Yen notes with an interest rate of 0.24% due 2025	40,000	—	360,360
Yen notes with an interest rate of 0.38% due 2027	60,000	60,000	540,541
Yen notes with an interest rate of 0.38% due 2028	40,000	—	360,360
Yen notes with an interest rate of 0.83% due 2038	20,000	—	180,180
Zero coupon convertible bonds due 2019	50,000	50,000	450,450
Zero coupon convertible bonds due 2021	50,000	50,000	450,450
Yen notes with a floating interest rate of 6 month Japanese yen TIBOR + 0% due 2024	—	1,488	—
	800,684	634,389	7,213,369
Less amounts due within one year	94,493	63,646	851,288
	¥ 706,191	¥ 570,743	\$ 6,362,081

At March 31, 2019, assets pledged as collateral were as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2019	2019
Time deposits	¥ 919		\$ 8,279
Property, plant and equipment, net	1,191		10,730
Investment securities	1,006		9,063
Others	623		5,613
	¥ 3,739		\$ 33,685

The annual maturities of long-term debt and lease obligations subsequent to March 31, 2019 were as follows:

	Millions of yen	Thousands of U.S. dollars
	2019	2019
Years ending March 31:		
2020	¥ 94,493	\$ 851,288
2021	111,114	1,001,027
2022	90,365	814,099
2023	83,914	755,982
2024	103,403	931,559
2025 and thereafter	317,395	2,859,414
	¥ 800,684	\$ 7,213,369

5. FINANCIAL INSTRUMENTS

Conditions of Financial Instruments

a) Policy in Relation to Financial Instruments

The policy of the Company and its consolidated subsidiaries is to manage funds only by short-term deposits, etc. and to raise funds by borrowing from banks and issuing corporate bonds. The Company and its consolidated subsidiaries use derivatives to hedge risks associated with foreign currency exchange rates and fluctuations of borrowing interest rates and do not enter into derivative transactions for speculative or trading purposes.

b) Contents and Risk of Financial Instruments and Risk Management System

Trade receivables are operating receivables and therefore are exposed to customer credit risk. Under its internal regulations, the Company carefully manages the payment periods for receivables and outstanding balances of all customers and regularly monitors the credit standing of major clients. Consolidated subsidiaries also monitor and manage the credit standings of their clients. Operating receivables and payables denominated in foreign currencies that arise from the global business operations are also exposed to foreign currency exchange risk. The Company and its consolidated subsidiaries hedge this risk mainly through the use of forward exchange contracts against positions after netting receivables and payables denominated in the same foreign currencies. Likewise, the Company and its consolidated subsidiaries mainly use currency swaps to hedge the foreign currency exchange risk of bank loans denominated in foreign currencies.

Investment securities are mostly the shares of corporations with which the Company and its consolidated subsidiaries have business relationships and are exposed to the risk of market price fluctuations. The fair value of the investment securities and financial positions of the issuing entities (clients) are regularly monitored.

Trade payables are operating payables, most of which are due and payable within one year.

Short-term bank loans and commercial paper are financing instruments mainly for operating transactions, while long-term bank loans and bonds are primarily for capital expenditures. Bank loans and bonds are exposed to the risk of interest rate fluctuation. Those with floating rates bear the risk of higher nominal interest expenses when interest rates rise, whereas those with fixed rates bear the risk of higher real interest expenses when interest rates fall. The Company and its consolidated subsidiaries use derivative transactions (interest rate swap transactions) to minimize the risk of interest rate fluctuation, taking into consideration the balance between fixed interest rates and floating interest rates.

Hedging instruments, hedged items, the policy for utilizing such hedging instruments and the method for evaluating the effectiveness of hedging activities are described in Note 1. SIGNIFICANT ACCOUNTING POLICIES d) Financial Instruments, Hedge Accounting in the Notes to the Consolidated Financial Statements.

Derivative transactions are executed and managed in accordance with the internal regulations prescribing the authorization for transactions. To mitigate the credit risk, the Company and its consolidated subsidiaries carry out derivative transactions only with highly rated financial institutions.

c) Supplemental Explanation on Fair Value of Financial Instruments

The fair value of financial instruments is based on market prices, or reasonable estimate of fair value for instruments for which market prices are not available. Estimates of fair value are subject to fluctuation because they employ various factors and assumptions. In addition, the contract amount of derivatives in Note 7. DERIVATIVES in the Notes to the Consolidated Financial Statements is not an indicator of market risk associated with derivative transactions.

Fair Value of Financial Instruments

Carrying value, fair value and unrealized gain (loss) as of March 31, 2019 and 2018 were as follows.

In addition, financial instruments, for which it is extremely difficult to measure the fair value, are not included. (Please refer to Note 2 below)

	Millions of yen		
	2019		
	Carrying value	Fair value	Unrealized gain (loss)
Cash and time deposits	¥ 168,507	¥ 168,507	¥ —
Trade receivables	531,058	531,058	—
Investment securities			
Held-to-maturity debt securities	101	105	4
Investment securities in subsidiaries and affiliated companies	73,940	62,426	(11,514)
Other securities	188,586	188,586	—
Assets	¥ 962,192	¥ 950,682	¥ (11,510)
Trade payables	¥ 240,554	¥ 240,554	¥ —
Short-term bank loans	175,567	175,567	—
Commercial paper	—	—	—
Bonds *1	340,000	345,092	5,092
Long-term bank loans *2	456,855	456,478	(377)
Liabilities	¥ 1,212,976	¥ 1,217,691	¥ 4,715
Derivative transactions *3			
Hedge accounting is not applied	¥ (587)	¥ (587)	¥ —
Hedge accounting is applied	779	779	—
Derivative transactions	¥ 192	¥ 192	¥ —

	Millions of yen		
	2018		
	Carrying value	Fair value	Unrealized gain (loss)
Cash and time deposits	¥ 141,101	¥ 141,101	¥ —
Trade receivables	489,549	489,549	—
Investment securities			
Held-to-maturity debt securities	100	101	1
Investment securities in subsidiaries and affiliated companies	75,608	62,736	(12,872)
Other securities	191,975	191,975	—
Assets	¥ 898,333	¥ 885,462	¥ (12,871)
Trade payables	¥ 245,550	¥ 245,550	¥ —
Short-term bank loans	135,936	135,936	—
Commercial paper	46,000	46,000	—
Bonds *1	241,493	263,419	21,926
Long-term bank loans *2	389,367	386,972	(2,395)
Liabilities	¥ 1,058,346	¥ 1,077,877	¥ 19,531
Derivative transactions *3			
Hedge accounting is not applied	¥ (614)	¥ (614)	¥ —
Hedge accounting is applied	(1,479)	(1,479)	—
Derivative transactions	¥ (2,093)	¥ (2,093)	¥ —

Thousands of U.S. dollars

	2019		
	Carrying value	Fair value	Unrealized gain (loss)
Cash and time deposits	\$ 1,518,081	\$ 1,518,081	\$ —
Trade receivables	4,784,306	4,784,306	—
Investment securities			
Held-to-maturity debt securities	910	946	36
Investment securities in subsidiaries and affiliated companies	666,126	562,396	(103,730)
Other securities	1,698,973	1,698,973	—
Assets	\$ 8,668,396	\$ 8,564,703	\$ (103,694)
Trade payables	\$ 2,167,153	\$ 2,167,153	\$ —
Short-term bank loans	1,581,685	1,581,685	—
Commercial paper	—	—	—
Bonds *1	3,063,063	3,108,937	45,874
Long-term bank loans *2	4,115,811	4,112,414	(3,396)
Liabilities	\$ 10,927,712	\$ 10,970,189	\$ 42,477
Derivative transactions *3			
Hedge accounting is not applied	\$ (5,288)	\$ (5,288)	\$ —
Hedge accounting is applied	7,018	7,018	—
Derivative transactions	\$ 1,730	\$ 1,730	\$ —

*1 Bonds include bonds due within one year.

*2 Long-term bank loans include long-term bank loans due within one year.

*3 Receivables and payables arising from derivative transactions are indicated in net amounts. Total net payables, if any, are shown in parentheses.

Notes:

1. Estimation method for fair value of financial instruments and items related to securities and derivative transactions

Assets

Cash and time deposits and Trade receivables

Carrying value is used for fair value since the items will be settled within the short term and the fair value is approximately equal to the carrying value.

Investment securities

Securities are valued at quoted market price. Debt securities, etc. are valued at quoted market price or at the price provided by correspondent financial institutions. For information on securities classified by holding purpose, please refer to Note 6. SECURITIES of the Notes to the Consolidated Financial Statements.

Liabilities

Trade payables, Short-term bank loans and Commercial paper

Carrying value is used for fair value since the items will be settled within the short term and the fair value is approximately equal to the carrying value.

Bonds

The fair value of bonds with market price is based on market price. The fair value of bonds without market price is estimated by discounting the principal amounts and interest based on interest rates adjusted for the remaining periods and credit risk of the bonds. However, for floating-rate bonds and fixed-rate bonds converted to floating using interest rate swaps accounted for under the special accounting method for interest rate swaps, the fair value is approximately equal to the carrying value because the interest rates are adjusted periodically. Therefore, the fair value is based on the carrying value.

Long-term bank loans

The fair value of long-term bank loans is estimated by discounting the principal amounts and interest based on estimated interest rates if similar new loans were entered into in the current period. The fair value of long-term bank loans for which the special accounting method for interest rate swaps is applied is estimated by discounting the total principal amount and interest (accounted for together with the interest rate swaps) based on estimated interest rates if similar new loans were entered into in the current period. For long-term bank loans at floating interest rates, however, the fair value is approximately equal to the carrying value because the interest rates are adjusted periodically. Therefore, the fair value is based on the carrying value.

Derivative transactions

Please refer to Note 7. DERIVATIVES in the Notes to the Consolidated Financial Statements.

2. Financial instruments for which it is extremely difficult to determine the fair value

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Unlisted equity securities	¥ 78,466	¥ 83,414	\$ 706,901
Unlisted debt securities	—	2,000	—

These securities have no quoted market price and the fair value is extremely difficult to determine. Therefore, they are not included in the preceding table.

3. Redemption schedule for receivables and investment securities with maturities at March 31, 2019 and 2018

	Millions of yen			
	2019			
	Due within one year	Due after one year through five years	Due after five years through ten years	Due after ten years
Cash and time deposits	¥ 168,507	¥ —	¥ —	¥ —
Trade receivables	531,058	—	—	—
Investment securities				
Held-to-maturity debt securities	32	58	11	—
Other securities	7,412	12	53	—
	¥ 707,009	¥ 70	¥ 64	¥ —

	Millions of yen			
	2018			
	Due within one year	Due after one year through five years	Due after five years through ten years	Due after ten years
Cash and time deposits	¥ 141,101	¥ —	¥ —	¥ —
Trade receivables	489,401	148	—	—
Investment securities				
Held-to-maturity debt securities	7	81	12	—
Other securities	—	12	53	—
	¥ 630,509	¥ 241	¥ 65	¥ —

	Thousands of U.S. dollars			
	2019			
	Due within one year	Due after one year through five years	Due after five years through ten years	Due after ten years
Cash and time deposits	\$ 1,518,081	\$ —	\$ —	\$ —
Trade receivables	4,784,306	—	—	—
Investment securities				
Held-to-maturity debt securities	288	523	99	—
Other securities	66,775	108	477	—
	\$ 6,369,450	\$ 631	\$ 577	\$ —

4. The redemption schedule for long-term debt is disclosed in Note 4. SHORT-TERM BANK LOANS, LONG-TERM DEBT AND LEASE OBLIGATIONS of the Notes to the Consolidated Financial Statements.

6. SECURITIES

At March 31, 2019 and 2018, information on securities classified as held-to-maturity debt securities was as follows:

	Millions of yen				Thousands of U.S. dollars			
	2019				2019			
	Carrying value	Fair value	Unrealized gains	Unrealized losses	Carrying value	Fair value	Unrealized gains	Unrealized losses
Held-to-maturity debt securities	¥ 101	¥ 105	¥ 4	¥ 0	\$ 910	\$ 946	\$ 36	\$ 0

	Millions of yen			
	2018			
	Carrying value	Fair value	Unrealized gains	Unrealized losses
Held-to-maturity debt securities	¥ 100	¥ 101	¥ 2	¥ 1

At March 31, 2019 and 2018, information on securities classified as other securities was as follows:

	Millions of yen				Thousands of U.S. dollars			
	2019				2019			
	Carrying value	Acquisition cost	Unrealized gains	Unrealized losses	Carrying value	Acquisition cost	Unrealized gains	Unrealized losses
Other securities	¥ 188,586	¥ 97,348	¥ 96,192	¥ 4,954	\$ 1,698,973	\$ 877,009	\$ 866,595	\$ 44,631

	Millions of yen			
	2018			
	Carrying value	Acquisition cost	Unrealized gains	Unrealized losses
Other securities	¥ 191,975	¥ 87,263	¥ 104,906	¥ 194

7. DERIVATIVES

The Company and its consolidated subsidiaries had the following derivative contracts outstanding at March 31, 2019 and 2018:

Hedge accounting is not applied

	Millions of yen			Thousands of U.S. dollars		
	Contract amount	Fair value	Unrealized gain (loss)	Contract amount	Fair value	Unrealized gain (loss)
2019						
Forward foreign exchange contracts:						
Buying U.S. dollar	¥ 6,481	¥ 24	¥ 24	\$ 58,387	\$ 216	\$ 216
Buying euro	10,298	(28)	(28)	92,775	(252)	(252)
Buying Thai baht	375	4	4	3,378	36	36
Buying Malaysian ringgit	649	4	4	5,847	36	36
Buying Japanese yen	4,453	(19)	(19)	40,117	(171)	(171)
Selling U.S. dollar	15,505	(102)	(102)	139,685	(919)	(919)
Selling euro	1,777	17	17	16,009	153	153
Selling Chinese yuan	931	(25)	(25)	8,387	(225)	(225)
Selling Thai baht	87	0	0	784	0	0
Selling Indonesian rupiah	136	0	0	1,225	0	0
Selling Japanese yen	8,331	(114)	(114)	75,054	(1,027)	(1,027)
Foreign currency swaps:						
Receiving U.S. dollar, paying Thai baht	3,688	(348)	(348)	33,225	(3,135)	(3,135)
	¥ —	¥ (587)	¥ (587)	\$ —	\$ (5,288)	\$ (5,288)

Millions of yen

	2018		
	Contract amount	Fair value	Unrealized gain (loss)
Forward foreign exchange contracts:			
Buying U.S. dollar	¥ 10,350	¥ (252)	¥ (252)
Buying euro	1,865	(32)	(32)
Buying Thai baht	370	3	3
Buying Malaysian ringgit	212	(2)	(2)
Buying Japanese yen	1,077	2	2
Selling U.S. dollar	14,057	117	117
Selling euro	1,532	32	32
Selling British pound	10	0	0
Selling Chinese yuan	402	(9)	(9)
Selling Thai baht	179	(1)	(1)
Selling Indonesian rupiah	87	(0)	(0)
Selling Japanese yen	5,806	(60)	(60)
Foreign currency swaps:			
Receiving U.S. dollar, paying Thai baht	3,592	(412)	(412)
	¥ —	¥ (614)	¥ (614)

Hedge accounting is applied

Millions of yen

		2019		
Hedge accounting method	Type of contract and primary hedged items	Contract amount	Fair value	Estimation method for fair value
Deferral hedge method	Forward foreign exchange contracts:			
	For trade receivables and trade payables			
	Buying Japanese yen	¥ 1,638	¥ (2)	Forward foreign exchange quotes
	Selling U.S. dollar	1,150	(11)	
	Selling euro	647	3	
	Selling Chinese yuan	182	1	
	Foreign currency swaps:			
	For long-term bank loans			
	Receiving U.S. dollar, paying Korean won	4,900	80	Prices provided by financial institutions
	Receiving Japanese yen, paying Korean won	7,782	225	
Interest rate swaps:				
For long-term bank loans			Prices provided by financial institutions	
Floating-rate receipt, fixed-rate payment	40,000	29		
Special accounting method for interest rate swaps	Interest rate swaps:			
	For bonds and long-term bank loans			
	Floating-rate receipt, fixed-rate payment	504		
	Floating-rate receipt, floating-rate payment	26,900	—*1	—
Fixed-rate receipt, floating rate payment	40,000			
Allocation method for forward foreign exchange contracts	Forward foreign exchange contracts:			
	For forecast transactions denominated in foreign currencies			
	Buying U.S. dollar	23,887	376	Forward foreign exchange quotes
	Buying euro	730	(8)	
	Buying Chinese yuan	537	(4)	
	Buying Thai baht	426	111	
	Buying Korean won	2,158	(20)	
	Selling U.S. dollar	21,422	(9)	
	Selling euro	649	8	
	Selling British pound	10	0	
	Selling Thai baht	1	0	
	Selling Japanese yen	52	0	
	Forward foreign exchange contracts:			
	For trade receivables and trade payables			
	Buying U.S. dollar	12,383		
	Buying euro	217		
	Buying British pound	1		
	Buying Chinese yuan	72		
	Buying Japanese yen	4		
	Selling U.S. dollar	28,612	—*2	—
	Selling euro	3,685		
	Selling British pound	13		
Selling Chinese yuan	44			
Selling Thai baht	6			
Foreign currency swaps:				
For long-term bank loans				
Receiving U.S. dollar, paying Japanese yen	129,389	—*2	—	
	¥ —	¥ 779		

DATA

		Millions of yen		
		2018		
Hedge accounting method	Type of contract and primary hedged items	Contract amount	Fair value	Estimation method for fair value
Deferral hedge method	Forward foreign exchange contracts:			
	For trade receivables and trade payables			
	Buying U.S. dollar	¥ 426	¥ 2	Forward foreign exchange quotes
	Buying Japanese yen	2,512	29	
	Selling U.S. dollar	854	(1)	
	Selling euro	1,202	1	
	Selling Chinese yuan	839	4	
	Foreign currency swaps:			
	For long-term bank loans			
	Receiving U.S. dollar, paying Korean won	5,994	(240)	Prices provided by
	Receiving Japanese yen, paying Korean won	10,196	(321)	financial institutions
	Interest rate swaps:			
	For long-term bank loans			Prices provided by
Floating-rate receipt, fixed-rate payment	54,985	153	financial institutions	
Special accounting method for interest rate swaps	Interest rate swaps:			
	For bonds and long-term bank loans			
	Floating-rate receipt, fixed-rate payment	364		
	Floating-rate receipt, floating-rate payment	26,900	—*1	—
Fixed-rate receipt, floating rate payment	40,000			
Allocation method for forward foreign exchange contracts	Forward foreign exchange contracts:			
	For forecast transactions denominated in foreign currencies			
	Buying U.S. dollar	21,996	(183)	Forward foreign exchange quotes
	Buying euro	123,153	(1,343)	
	Buying Chinese yuan	367	(1)	
	Buying Thai baht	483	105	
	Buying Korean won	177	(2)	
	Selling U.S. dollar	9,583	280	
	Selling euro	1,422	38	
	Selling British pound	10	0	
	Selling Thai baht	3	0	
	Selling Japanese yen	30	0	
	Forward foreign exchange contracts:			
	For trade receivables and trade payables			
	Buying U.S. dollar	12,568		
	Buying euro	91		
	Buying Chinese yuan	8		
	Buying Korean won	31		
	Buying Japanese yen	7	—*2	—
	Selling U.S. dollar	25,303		
Selling euro	3,854			
Selling British pound	28			
Selling Chinese yuan	73			
Foreign currency swaps:				
For long-term bank loans				
Receiving U.S. dollar, paying Japanese yen	131,046	—*2	—	
	¥ —	¥ (1,479)		

Thousands of U.S. dollars

		2019		
Hedge accounting method	Type of contract and primary hedged items	Contract amount	Fair value	Estimation method for fair value
Deferral hedge method	Forward foreign exchange contracts:			
	For trade receivables and trade payables			
	Buying Japanese yen	\$ 14,757	\$ (18)	Forward foreign exchange quotes
	Selling U.S. dollar	10,360	(99)	
	Selling euro	5,829	27	
	Selling Chinese yuan	1,640	9	
	Foreign currency swaps:			
	For long-term bank loans			
	Receiving U.S. dollar, paying Korean won	44,144	721	Prices provided by financial institutions
	Receiving Japanese yen, paying Korean won	70,108	2,027	
Interest rate swaps:				
For long-term bank loans			Prices provided by financial institutions	
Floating-rate receipt, fixed-rate payment	360,360	261		
Special accounting method for interest rate swaps	Interest rate swaps:			
	For bonds and long-term bank loans			
	Floating-rate receipt, fixed-rate payment	4,541		
	Floating-rate receipt, floating-rate payment	242,342	—*1	—
Fixed-rate receipt, floating rate payment	360,360			
Allocation method for forward foreign exchange contracts	Forward foreign exchange contracts:			
	For forecast transactions denominated in foreign currencies			
	Buying U.S. dollar	215,198	3,387	Forward foreign exchange quotes
	Buying euro	6,577	(72)	
	Buying Chinese yuan	4,838	(36)	
	Buying Thai baht	3,838	1,000	
	Buying Korean won	19,441	(180)	
	Selling U.S. dollar	192,991	(81)	
	Selling euro	5,847	72	
	Selling British pound	90	0	
	Selling Thai baht	9	0	
	Selling Japanese yen	468	0	
	Forward foreign exchange contracts:			
	For trade receivables and trade payables			
	Buying U.S. dollar	111,559		
	Buying euro	1,955		
	Buying British pound	9		
	Buying Chinese yuan	649		
	Buying Japanese yen	36		
	Selling U.S. dollar	257,766	—*2	—
	Selling euro	33,198		
	Selling British pound	117		
	Selling Chinese yuan	396		
Selling Thai baht	54			
Foreign currency swaps:				
For long-term bank loans				
Receiving U.S. dollar, paying Japanese yen	1,165,667	—*2	—	
		\$ —	\$ 7,018	

*1 The fair value of interest rate swaps to which a special accounting method is applied is included in the fair value of bonds and long-term bank loans in Note 5. FINANCIAL INSTRUMENTS of the Notes to the Consolidated Financial Statements because such interest rate swaps are accounted for together with the corresponding bonds and long-term bank loans.

*2 The fair value of forward foreign exchange contracts to which the allocation method is applied, except for forecast transactions, is included in the fair value of trade receivables, trade payables and long-term bank loans in Note 5. FINANCIAL INSTRUMENTS of the Notes to the Consolidated Financial Statements since such forward foreign exchange contracts are accounted for together with the corresponding trade receivables, trade payables and long-term bank loans.

DATA

8. RETIREMENT BENEFIT PLAN

The changes in the retirement benefit obligation during the years ended March 31, 2019 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Retirement benefit obligation at beginning of the year	¥ 190,262	¥ 196,911	\$ 1,714,072
Service cost	7,171	7,552	64,604
Interest cost	1,549	1,596	13,955
Actuarial gains and losses	(109)	(1,573)	(982)
Retirement benefit paid	(14,225)	(14,178)	(128,153)
Past service cost	(294)	—	(2,649)
Other	(215)	(46)	(1,937)
Retirement benefit obligation at end of the year	¥ 184,139	¥ 190,262	\$ 1,658,910

The changes in the plan assets at fair value during the years ended March 31, 2019 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Plan assets at beginning of the year	¥ 117,288	¥ 121,774	\$ 1,056,649
Expected return on plan assets	2,417	2,560	21,775
Actuarial gains and losses	(2,154)	5,738	(19,405)
Contributions	7,547	6,602	67,991
Retirement benefit paid	(8,858)	(9,258)	(79,802)
Return of assets from retirement benefits trust	(7,867)	(9,931)	(70,874)
Other	(524)	(197)	(4,721)
Plan assets at end of the year	¥ 107,849	¥ 117,288	\$ 971,613

The following table sets forth the funded status of the plans and the amounts recognized in the consolidated balance sheets as of March 31, 2019 and 2018 for the Company's and its consolidated subsidiaries' defined benefit plans:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Funded retirement benefit obligation	¥ 90,262	¥ 96,258	\$ 813,171
Plan assets at fair value	(107,849)	(117,288)	(971,613)
	(17,587)	(21,030)	(158,441)
Unfunded retirement benefit obligation	93,877	94,004	845,739
Net liability for retirement benefits in the balance sheets	76,290	72,974	687,297
Net defined benefit liability	100,730	101,786	907,477
Net defined benefit asset (included in other non-current assets)	(24,440)	(28,812)	(220,180)
Net liability for retirement benefits in the balance sheets	¥ 76,290	¥ 72,974	\$ 687,297

The components of retirement benefit expense for the years ended March 31, 2019 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Service cost	¥ 7,171	¥ 7,552	\$ 64,604
Interest cost	1,549	1,596	13,955
Expected return on plan assets	(2,417)	(2,560)	(21,775)
Amortization of actuarial gains and losses	2,465	622	22,207
Amortization of past service cost	(36)	(4,248)	(324)
Gain on return of assets from retirement benefits trust	(2,532)	—	(22,811)
Retirement benefit expense	¥ 6,200	¥ 2,962	\$ 55,856

In addition to the above, special severance payments of ¥1,705 million (\$15,360 thousand) and ¥1,442 million were recognized for the years ended March 31, 2019 and 2018, respectively. Contributions to defined contribution pension plans of ¥7,118 million (\$64,126 thousand) and ¥6,996 million were recognized for the years ended March 31, 2019 and 2018, respectively.

The components of remeasurements of defined benefit plans included in other comprehensive income (before tax effect) for the years ended March 31, 2019 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Past service cost	¥ 258	¥ (4,248)	\$ 2,324
Actuarial gains and losses	(2,114)	7,960	(19,045)
Total	¥ (1,856)	¥ 3,712	\$ (16,721)

The components of remeasurements of defined benefit plans included in accumulated other comprehensive income (before tax effect) as of March 31, 2019 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Unrecognized past service cost	¥ (212)	¥ 46	\$ (1,910)
Unrecognized actuarial gains and losses	(3,896)	(6,010)	(35,099)
Total	¥ (4,108)	¥ (5,964)	\$ (37,009)

The fair value of plan assets, by major category, as a percentage of total plan assets as of March 31, 2019 and 2018 was as follows:

	2019	2018
Bonds	9%	11%
Stocks	45%	50%
General accounts of life insurance companies	27%	26%
Cash and time deposits	16%	10%
Other	3%	3%
Total	100%	100%

The expected rate of return on plan assets is determined based on the current and anticipated allocation of plan assets and the current and expected long-term returns on diverse assets that compose the plan assets.

The key assumptions used in accounting for the above plans were as follows:

	2019	2018
Discount rate	primarily 0.6%	primarily 0.6%
Expected rate of return on plan assets	primarily 2.0%	primarily 2.0%
Expected rate of salary increase	primarily 5.9%	primarily 7.5%

9. STOCK OPTION PLANS

1. Stock option expenses included in selling, general and administrative expenses amounted to ¥290 million (\$2,613 thousand) and ¥338 million for the years ended March 31, 2019 and 2018, respectively.

2. Information on stock options issued

The following table summarizes the stock options outstanding as of March 31, 2019.

Company name		Toray Industries, Inc.		
		No.1 Stock Option Plan	No.2 Stock Option Plan	No.3 Stock Option Plan
Position and number of grantees	Members of the Board of the Company	28	26	26
	Directors of the Company	32	32	26
Class and number of shares to be issued upon exercise	Common stock	747,000 shares	844,000 shares	583,000 shares
Grant date		August 20, 2011	August 4, 2012	August 10, 2013
Vesting conditions		Based on the number of months that have elapsed during the vesting period	Based on the number of months that have elapsed during the vesting period	Based on the number of months that have elapsed during the vesting period
Vesting period		June 24, 2011- June 22, 2012	June 22, 2012- June 26, 2013	June 26, 2013- June 25, 2014
Exercise period		August 21, 2011- August 20, 2041	August 5, 2012- August 4, 2042	August 11, 2013- August 10, 2043

Company name		Toray Industries, Inc.		
		No.4 Stock Option Plan	No.5 Stock Option Plan	No. 6 Stock Option Plan
Position and number of grantees	Members of the Board of the Company	25	23	23
	Directors of the Company	27	31	30
Class and number of shares to be issued upon exercise	Common stock	569,000 shares	358,000 shares	381,000 shares
Grant date		August 9, 2014	August 22, 2015	August 20, 2016
Vesting conditions		Based on the number of months that have elapsed during the vesting period	Based on the number of months that have elapsed during the vesting period	Based on the number of months that have elapsed during the vesting period
Vesting period		June 25, 2014- June 24, 2015	June 24, 2015- June 28, 2016	June 28, 2016- June 27, 2017
Exercise period		August 10, 2014- August 9, 2044	August 23, 2015- August 22, 2045	August 21, 2016- August 20, 2046

Company name		Toray Industries, Inc.	
		No.7 Stock Option Plan	No.8 Stock Option Plan
Position and number of grantees	Members of the Board of the Company	23	17
	Directors of the Company	31	35
Class and number of shares to be issued upon exercise	Common stock	374,000 shares	387,000 shares
Grant date		August 19, 2017	August 18, 2018
Vesting conditions		Based on the number of months that have elapsed during the vesting period	Based on the number of months that have elapsed during the vesting period
Vesting period		June 27, 2017- June 26, 2018	June 26, 2018- June 25, 2019
Exercise period		August 20, 2017- August 19, 2047	August 19, 2018- August 18, 2048

The following table summarizes movements of stock options during the year and price information on stock options as of March 31, 2019. The number of stock options are translated into the number of shares.

(1) Number of stock options

Company name	Toray Industries, Inc.		
	No.1 Stock Option Plan	No.2 Stock Option Plan	No.3 Stock Option Plan
Stock acquisition rights not yet vested			
As of March 31, 2018	—	—	—
Granted	—	—	—
Forfeited	—	—	—
Vested	—	—	—
As of March 31, 2019	—	—	—
Stock acquisition rights already vested			
As of March 31, 2018	218,000	290,000	252,000
Vested	—	—	—
Exercised	59,000	74,000	58,000
Forfeited	—	—	—
As of March 31, 2019	159,000	216,000	194,000

Company name	Toray Industries, Inc.		
	No.4 Stock Option Plan	No.5 Stock Option Plan	No.6 Stock Option Plan
Stock acquisition rights not yet vested			
As of March 31, 2018	—	—	—
Granted	—	—	—
Forfeited	—	—	—
Vested	—	—	—
As of March 31, 2019	—	—	—
Stock acquisition rights already vested			
As of March 31, 2018	302,000	241,000	330,000
Vested	—	—	—
Exercised	66,000	48,000	59,000
Forfeited	—	—	—
As of March 31, 2019	236,000	193,000	271,000

Company name	Toray Industries, Inc.	
	No.7 Stock Option Plan	No.8 Stock Option Plan
Stock acquisition rights not yet vested		
As of March 31, 2018	109,000	—
Granted	—	387,000
Forfeited	—	—
Vested	109,000	277,000
As of March 31, 2019	—	110,000
Stock acquisition rights already vested		
As of March 31, 2018	265,000	—
Vested	109,000	277,000
Exercised	61,000	—
Forfeited	—	—
As of March 31, 2019	313,000	277,000

DATA

(2) Price information

Yen

Company name	Toray Industries, Inc.		
	No.1 Stock Option Plan	No.2 Stock Option Plan	No.3 Stock Option Plan
Exercise price	¥ 1	¥ 1	¥ 1
Weighted average price at exercise	852.7	852.7	852.7
Fair value per share at the grant date	513	394	546

Yen

Company name	Toray Industries, Inc.		
	No.4 Stock Option Plan	No.5 Stock Option Plan	No.6 Stock Option Plan
Exercise price	¥ 1	¥ 1	¥ 1
Weighted average price at exercise	852.7	852.7	852.7
Fair value per share at the grant date	605	987	902

Yen

Company name	Toray Industries, Inc.	
	No.7 Stock Option Plan	No.8 Stock Option Plan
Exercise price	¥ 1	¥ 1
Weighted average price at exercise	852.7	—
Fair value per share at the grant date	899	710

U.S. dollars

Company name	Toray Industries, Inc.		
	No.1 Stock Option Plan	No.2 Stock Option Plan	No.3 Stock Option Plan
Exercise price	\$ 0.01	\$ 0.01	\$ 0.01
Weighted average price at exercise	7.68	7.68	7.68
Fair value per share at the grant date	4.62	3.55	4.92

U.S. dollars

Company name	Toray Industries, Inc.		
	No.4 Stock Option Plan	No.5 Stock Option Plan	No.6 Stock Option Plan
Exercise price	\$ 0.01	\$ 0.01	\$ 0.01
Weighted average price at exercise	7.68	7.68	7.68
Fair value per share at the grant date	5.45	8.89	8.13

U.S. dollars

Company name	Toray Industries, Inc.	
	No.7 Stock Option Plan	No.8 Stock Option Plan
Exercise price	\$ 0.01	\$ 0.01
Weighted average price at exercise	7.68	—
Fair value per share at the grant date	8.10	6.40

DATA

3. Estimation method and assumptions used for the per share fair value of stock options

(1) Estimation method

Black-Scholes model

(2) Assumptions used for the per share fair value of stock options

Company name	Toray Industries, Inc.
	No.8 Stock Option Plan
Expected volatility*1	24.874%
Expected holding period*2	7 years
Expected dividend*3	¥15 per share (\$0.14)
Risk-free rate*4	(0.015)%

*1 The expected volatility is based on actual share prices during 7 years from August 19, 2011 to August 17, 2018.

*2 The expected holding period is calculated based on the service period of past members of the Board.

*3 This is based on the dividend for the year ended March 31, 2018.

*4 The risk-free interest rate is the yield on Japanese government bonds for the period that corresponds to the remaining life of the option.

Because it is difficult to reasonably estimate the number of options that will expire in the future, only the number of options that have actually forfeited is applied.

10. INCOME TAXES

The statutory tax rates in Japan for the years ended March 31, 2019 and 2018 were 30.6% and 30.9%, respectively.

At March 31, 2019 and 2018, significant components of deferred tax assets and liabilities were as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Deferred tax assets:			
Accrued bonuses	¥ 6,496	¥ 6,134	\$ 58,523
Depreciation and impairment loss	10,379	10,876	93,505
Net defined benefit liability	31,035	32,101	279,595
Net operating loss carryforwards (Note)	14,924	13,473	134,450
Unrealized intercompany profits	15,362	15,401	138,396
Other	36,944	33,481	332,829
	115,140	111,466	1,037,297
Valuation allowance for net operating loss carryforwards (Note)	(12,673)	—	(114,171)
Valuation allowance for deductible temporary differences	(15,213)	—	(137,054)
Total valuation allowance	(27,886)	(23,228)	(251,225)
Total deferred tax assets	87,254	88,238	786,072
Deferred tax liabilities:			
Reserve for tax purpose reduction entry	6,157	4,571	55,468
Depreciation	21,195	18,419	190,946
Undistributed earnings of subsidiaries and affiliated companies	22,154	19,870	199,586
Unrealized gains on securities	28,990	31,776	261,171
Acquisition-related basis differences	19,746	4,700	177,892
Other	15,792	18,750	142,270
Total deferred tax liabilities	114,034	98,086	1,027,333
Net deferred tax assets (liabilities)	¥ (26,780)	¥ (9,848)	\$ (241,261)

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Note: A breakdown of net operating loss carryforwards and valuation allowance by expiry date as of March 31, 2019 is as follows:

Millions of yen							
2019							
	Due within one year	Due after one year through two years	Due after two years through three years	Due after three years through four years	Due after four years through five years	Due after five years	Total
Net operating loss carryforwards*	¥ 1,108	¥ 537	¥ 841	¥ 591	¥ 1,105	¥ 10,742	¥ 14,924
Valuation allowance	(1,106)	(434)	(401)	(522)	(891)	(9,319)	(12,673)
Deferred tax assets	¥ 2	¥ 103	¥ 440	¥ 69	¥ 214	¥ 1,423	¥ 2,251

Thousands of U.S. dollars							
2019							
	Due within one year	Due after one year through two years	Due after two years through three years	Due after three years through four years	Due after four years through five years	Due after five years	Total
Net operating loss carryforwards*	\$ 9,982	\$ 4,838	\$ 7,577	\$ 5,324	\$ 9,955	\$ 96,775	\$ 134,450
Valuation allowance	(9,964)	(3,910)	(3,613)	(4,703)	(8,027)	(83,955)	(114,171)
Deferred tax assets	\$ 18	\$ 928	\$ 3,964	\$ 622	\$ 1,928	\$ 12,820	\$ 20,279

* The amount is determined by multiplying the corresponding net operating loss carryforwards by the effective statutory tax rate.

Changes in Presentation

"Acquisition-related basis differences" that were posted in "Other" under "Deferred tax liabilities" as of March 31, 2018 are listed as a separate line item starting from the year ended March 31, 2019 due to an increase in materiality. The figures as of March 31, 2018 are restated to reflect this change in presentation.

As a result, ¥23,450 million posted in "Other" under "Deferred tax liabilities" as of March 31, 2018 is reclassified into "Acquisition-related basis differences" of ¥4,700 million and "Other" of ¥18,750 million.

The reconciliation of the statutory tax rate and the effective income tax rate for the years ended March 31, 2019 and 2018 was as follows:

	2019	2018
Statutory tax rate	—	30.9%
Increase (decrease) in taxes resulting from:		
Permanent differences	—	0.7
Recognition of certain deferred tax assets by reversal of valuation allowance	—	(0.2)
Equity in earnings of unconsolidated subsidiaries and affiliated companies	—	(2.1)
Income taxes for prior periods	—	(0.2)
Differences of tax rates for overseas consolidated subsidiaries	—	(3.9)
Undistributed earnings of subsidiaries and affiliated companies	—	1.6
Impact of the Tax Cuts and Jobs Act in the United States	—	(3.2)
Amortization of goodwill	—	2.0
Other	—	(1.1)
Effective income tax rate	—	24.5%

* Information for the year ended March 31, 2019 is not provided because the difference between the statutory tax rate and the effective income tax rate was less than 5% of the statutory tax rate.

11. NET ASSETS

The Corporation Law of Japan provides that an amount equal to 10% of the amount to be disbursed as distributions of capital surplus (other than the capital reserve) and retained earnings (other than the earned reserve) be transferred to the capital reserve and the earned reserve, respectively, until the sum of the capital reserve and the earned reserve equals 25% of the capital stock account. Such distributions can be made at any time by resolution

of the stockholders, or by the Board of Directors if certain conditions are met.

At the June 2019 annual stockholders' meeting, stockholders approved the payment of cash dividends of ¥8.00 per share, aggregating to ¥12,806 million (\$115,369 thousand) which has not been reflected in the accompanying consolidated financial statements for the year ended March 31, 2019.

12. COMMITMENTS AND CONTINGENT LIABILITIES

At March 31, 2019, commitment line of credit to unconsolidated subsidiaries and affiliated companies was as follows:

	Millions of yen	Thousands of U.S. dollars
	2019	2019
Total commitment line of credit	¥ 380	\$ 3,423
Loans receivable outstanding	155	1,396
Balance	¥ 225	\$ 2,027

This commitment does not necessarily imply that the unused amount may be fully utilized.

At March 31, 2019 and 2018, contingent liabilities were as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
As guarantors of loans to:			
Unconsolidated subsidiaries and affiliated companies	¥ 6,579	¥ 5,959	\$ 59,270
Other	3,341	3,494	30,099
	¥ 9,920	¥ 9,453	\$ 89,369
Notes discounted	¥ 1,550	¥ 1,922	\$ 13,964
Export bills discounted	6,140	2,820	55,315
Notes endorsed	1,755	1,538	15,811
Contingent liabilities associated with securitization of receivables	¥ 1,187	¥ 1,216	\$ 10,694

13. LEASES

Finance leases

The Company and its consolidated subsidiaries hold certain buildings, machinery and equipment and intangible assets by leases.

Operating leases

Future minimum lease payments under non-cancellable operating leases subsequent to March 31, 2019 and 2018 were as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Due within one year	¥ 903	¥ 358	\$ 8,135
Due after one year	5,535	952	49,865
Total	¥ 6,438	¥ 1,310	\$ 58,000

14. RESEARCH AND DEVELOPMENT EXPENSES

Research and development expenses included in cost of sales and selling, general and administrative expenses for the years ended March 31, 2019 and 2018 were ¥66,355 million (\$597,793 thousand) and ¥66,229 million, respectively.

15. LOSS ON IMPAIRMENT OF FIXED ASSETS

The Company and its consolidated subsidiaries grouped assets used for business based on the classification under the management accounting. For assets to be disposed and idle assets, each individual asset is considered to constitute a group.

For the year ended March 31, 2019, the carrying value of goodwill, intangible assets and other assets of some consolidated subsidiaries was fully written down because the originally anticipated income was not expected any longer.

As a result, the Company and its consolidated subsidiaries recognized loss on impairment in the amount of ¥18,414 million (\$165,892 thousand).

The major assets for which a loss on impairment was recognized were as follows:

Location	Use	Classification	Millions of yen	Thousands of U.S. dollars
			Loss on impairment	Loss on impairment
Seoul, Korea, etc.	Fibers & Textiles	Machinery and equipment	¥ 840	\$ 7,568
		Goodwill	6,054	54,541
		Other intangible assets	5,154	46,432
Yokohama, Kanagawa, Japan	Environment & Engineering	Goodwill	¥ 1,654	\$ 14,901

The recoverable amount of the above assets was measured at value in use, and that of goodwill and other intangible assets was assessed at zero.

For the year ended March 31, 2018, the carrying value of certain business-use assets for which profitability declined were written down to the recoverable amount.

As a result, the Company and its consolidated subsidiaries recognized loss on impairment of fixed assets in the amount of ¥3,944 million.

The major assets for which a loss on impairment was recognized were as follows:

Location	Use	Classification	Millions of yen
			Loss on impairment
Esslingen, Germany, etc.	Composites production facilities	Buildings	¥ 156
		Machinery and equipment	893
		Construction in progress	1,781
		Other	94

The recoverable amount of the above assets was measured at the net selling value. The net selling value was calculated based on the appraisal value.

16. OTHER COMPREHENSIVE INCOME

The following table presents reclassification adjustments and tax effects allocated to each component of other comprehensive income for the years ended March 31, 2019 and 2018.

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Net unrealized gains (losses) on securities:			
Amount arising during the year	¥(12,196)	¥ 15,089	\$ (109,874)
Reclassification adjustments for gains and losses included in net income	(1,296)	(3,400)	(11,676)
Before tax effect	(13,492)	11,689	(121,550)
Tax effect	3,913	(3,589)	35,252
Net unrealized gains (losses) on securities	(9,579)	8,100	(86,297)
Net deferred gains (losses) on hedges:			
Amount arising during the year	1,414	(1,302)	12,739
Reclassification adjustments for gains and losses included in net income	(25)	(104)	(225)
Basis adjustments for assets	130	—	1,171
Before tax effect	1,519	(1,406)	13,685
Tax effect	(455)	409	(4,099)
Net deferred gains (losses) on hedges	1,064	(997)	9,586
Foreign currency translation adjustments:			
Amount arising during the year	(4,767)	(4,471)	(42,946)
Reclassification adjustments for gains and losses included in net income	—	(1,375)	—
Before tax effect	(4,767)	(5,846)	(42,946)
Tax effect	—	26	—
Foreign currency translation adjustments	(4,767)	(5,820)	(42,946)
Remeasurements of defined benefit plans:			
Amount arising during the year	(1,753)	7,338	(15,793)
Reclassification adjustments for gains and losses included in net income	(103)	(3,626)	(928)
Before tax effect	(1,856)	3,712	(16,721)
Tax effect	531	(1,077)	4,784
Remeasurements of defined benefit plans	(1,325)	2,635	(11,937)
Share of other comprehensive income of unconsolidated subsidiaries and affiliated companies accounted for by the equity method:			
Amount arising during the year	(422)	(1,697)	(3,802)
Reclassification adjustments for gains and losses included in net income	(183)	(73)	(1,649)
Share of other comprehensive income of unconsolidated subsidiaries and affiliated companies accounted for by the equity method	(605)	(1,770)	(5,450)
Total other comprehensive income	¥(15,212)	¥ 2,148	\$ (137,045)

DATA

17. BUSINESS COMBINATIONS

Business combination by acquisition

1. Overview of the business combination

The Company purchased all shares of TenCate Advanced Composites Holding B.V. (TCAC) on July 17, 2018.

(1) Name of the acquired company and description of its business

Name of the acquired company

TenCate Advanced Composites Holding B.V.

Description of business

Manufacture and distribution of carbon fiber composite materials

(2) Major reason for the business combination

TCAC is a prepreg manufacturer with its main manufacturing bases in Europe and the U.S. and has a track record of widely supplying thermoplastic resins and high heat resistance thermoset resin materials. Especially, TCAC is a global leading company of carbon fiber intermediate materials using thermoplastic resins. The acquisition is expected to generate significant synergies by combining the product lineup in which TCAC specializes with the broad range of carbon fiber as well as polymer technologies, which are Toray's strengths. Combining the two companies' distribution channels, the Company can offer a wider product lineup to the customers.

Toray will respond swiftly to the expansion of the market for small-sized aircraft and expand the business further for industrial use applications including automobiles in the medium- to long-term.

(3) Date of the business combination

July 17, 2018

(4) Legal form of the business combination

Share acquisition in consideration of cash

(5) Name of the company after the business combination

Toray TCAC Holding B.V.

(6) Percentage of voting rights acquired

100%

(7) Basis for determining an acquiring company

The Company acquired 100% of the voting rights through a share acquisition in consideration of cash.

2. Period of acquiree's results included in the consolidated financial statements

From October 1, 2018 to March 31, 2019

3. Acquisition cost

Consideration for acquisition	Cash	¥117,117 million (\$1,055,108 thousand)
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Acquisition cost		¥117,117 million (\$1,055,108 thousand)
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4. Major acquisition-related costs

Advisory fees and others	¥1,205 million (\$10,856 thousand)
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5. Amount of goodwill incurred, reasons for the goodwill incurred and the method and period of amortization

(1) Amount of goodwill incurred

¥65,783 million (\$592,640 thousand)

(2) Reasons for the goodwill incurred

Since the acquisition cost exceeded the net amount of assets acquired and liabilities assumed, the excess amount was recorded as goodwill.

(3) Method and period of amortization

Goodwill is amortized by the straight-line method over 20 years.

6. Assets acquired and liabilities assumed on the date of the business combination

	Millions of yen	Thousands of U.S. dollars
Current assets	¥ 11,422	\$ 102,901
Non-current assets	72,566	653,748
Total assets	¥ 83,988	\$ 756,649
Current liabilities	¥ 13,864	\$ 124,901
Non-current liabilities	18,940	170,631
Total liabilities	¥ 32,804	\$ 295,532

7. Breakdown of amount allocated to intangible assets other than goodwill and weighted average amortization period by major type of asset

Breakdown by major type	Millions of yen	Thousands of U.S. dollars	Amortization period
	Amount		
Customer-related assets	¥ 42,021	\$ 378,568	20 years
Technology-related assets	26,957	242,856	24 years
Total	¥ 68,978	\$ 621,423	22 years

8. Effect on the consolidated statements of income assuming the business combination had been carried out on April 1, 2018

The effect on operating results for the year ended March 31, 2019 was immaterial. This information has not been audited by the independent auditors of the Company.

18. SUPPLEMENTARY CASH FLOW INFORMATION

The following table reconciles the net payments with the acquisition cost with regard to the share acquisition of TenCate Advanced Composites Holding B.V. executed in the year ended March 31, 2019.

	Millions of yen	Thousands of U.S. dollars
	2019	2019
Acquisition cost	¥ 117,117	\$ 1,055,108
Cash and cash equivalents	(2,553)	(23,000)
Net payments for acquisition	¥ 114,564	\$ 1,032,108

19. SEGMENT INFORMATION

1. Outline of reportable segments

The reportable segments of the Company and its consolidated subsidiaries are components for which discrete financial information is available and whose operating results are regularly reviewed by the Board of Directors to make decisions about resource allocation to the segments and assess performance.

The Company identifies the following five segments according to the nature of the products and market for their products.

Reportable segment	Main products
Fibers & Textiles	Filament yarns, staple fibers, spun yarns, woven and knitted fabrics of nylon, polyester, acrylic and others; non-woven fabrics; ultra-microfiber non-woven fabric with suede texture; apparel products
Performance Chemicals	Nylon, ABS, PBT, PPS and other resins and molded products; polyolefin foam; polyester, polyethylene, polypropylene and other films and processed film products; raw materials for synthetic fibers and other plastics; fine chemicals; electronic and information materials and graphic materials
Carbon Fiber Composite Materials	Carbon fibers, carbon fiber composite materials and their molded products
Environment & Engineering	Comprehensive engineering; condominiums; industrial equipment and machinery; IT-related equipment; water treatment membranes and related equipment; materials for housing, building and civil engineering applications
Life Science	Pharmaceuticals, medical devices, etc.

2. Measurement of sales, income, assets and other material items of reportable segments

The accounting policies for the reportable segments are the same as those described in Note 1. SIGNIFICANT ACCOUNTING POLICIES. The figures of segment income are based on operating income. Intersegment sales are determined based on consideration of the market price and related information.

3. Information on sales, income, assets and other material items of reportable segments

Millions of yen									
2019									
	Fibers & Textiles	Performance Chemicals	Carbon Fiber Composite Materials	Environment & Engineering	Life Science	Others**1	Total	Adjustments**2	Consolidated Total**3
Sales to outside customers	¥ 974,265	¥ 868,847	¥ 215,913	¥ 257,673	¥ 53,653	¥ 18,497	¥ 2,388,848	¥ —	¥ 2,388,848
Intersegment sales	1,372	18,985	820	74,960	—	26,536	122,673	(122,673)	—
Total sales	¥ 975,637	¥ 887,832	¥ 216,733	¥ 332,633	¥ 53,653	¥ 45,033	¥ 2,511,521	¥ (122,673)	¥ 2,388,848
Segment income	¥ 72,880	¥ 67,702	¥ 11,542	¥ 12,236	¥ 1,301	¥ 3,084	¥ 168,745	¥ (27,276)	¥ 141,469
Segment assets	¥ 795,382	¥ 1,002,305	¥ 640,161	¥ 255,338	¥ 70,792	¥ 83,764	¥ 2,847,742	¥ (59,391)	¥ 2,788,351
Depreciation and amortization	29,342	39,099	25,042	4,531	2,638	1,416	102,068	(357)	101,711
Investment in unconsolidated subsidiaries and affiliated companies accounted for by the equity method	76,464	50,969	1,611	12,205	2,849	8,248	152,346	(318)	152,028
Capital expenditures *4	51,726	67,004	43,079	7,621	2,126	3,430	174,986	(2,290)	172,696

Millions of yen									
2018									
	Fibers & Textiles	Performance Chemicals	Carbon Fiber Composite Materials	Environment & Engineering	Life Science	Others**1	Total	Adjustments**2	Consolidated Total**3
Sales to outside customers	¥ 913,610	¥ 803,310	¥ 177,949	¥ 238,256	¥ 53,803	¥ 17,930	¥ 2,204,858	¥ —	¥ 2,204,858
Intersegment sales	1,248	17,902	591	69,453	—	24,456	113,650	(113,650)	—
Total sales	¥ 914,858	¥ 821,212	¥ 178,540	¥ 307,709	¥ 53,803	¥ 42,386	¥ 2,318,508	¥ (113,650)	¥ 2,204,858
Segment income	¥ 72,418	¥ 71,363	¥ 20,764	¥ 13,287	¥ 1,942	¥ 2,897	¥ 182,671	¥ (26,207)	¥ 156,464
Segment assets	¥ 778,930	¥ 974,165	¥ 463,640	¥ 273,259	¥ 78,194	¥ 64,362	¥ 2,632,550	¥ (56,640)	¥ 2,575,910
Depreciation and amortization	28,186	37,451	21,575	4,719	2,572	1,418	95,921	(106)	95,815
Investment in unconsolidated subsidiaries and affiliated companies accounted for by the equity method	84,079	48,318	8,073	10,930	2,780	7,867	162,047	(240)	161,807
Capital expenditures *4	48,761	61,362	32,604	5,978	2,768	1,564	153,037	287	153,324

Thousands of U.S. dollars									
2019									
	Fibers & Textiles	Performance Chemicals	Carbon Fiber Composite Materials	Environment & Engineering	Life Science	Others**1	Total	Adjustments**2	Consolidated Total**3
Sales to outside customers	\$ 8,777,162	\$ 7,827,450	\$ 1,945,162	\$ 2,321,378	\$ 483,360	\$ 166,640	\$ 21,521,153	\$ —	\$ 21,521,153
Intersegment sales	12,360	171,036	7,387	675,315	—	239,063	1,105,162	(1,105,162)	—
Total sales	\$ 8,789,523	\$ 7,998,486	\$ 1,952,550	\$ 2,996,694	\$ 483,360	\$ 405,703	\$ 22,626,315	\$ (1,105,162)	\$ 21,521,153
Segment income	\$ 656,577	\$ 609,928	\$ 103,982	\$ 110,234	\$ 11,721	\$ 27,784	\$ 1,520,225	\$ (245,730)	\$ 1,274,495
Segment assets	\$ 7,165,604	\$ 9,029,775	\$ 5,767,216	\$ 2,300,342	\$ 637,766	\$ 754,631	\$ 25,655,333	\$ (535,054)	\$ 25,120,279
Depreciation and amortization	264,342	352,243	225,604	40,820	23,766	12,757	919,532	(3,216)	916,315
Investment in unconsolidated subsidiaries and affiliated companies accounted for by the equity method	688,865	459,180	14,514	109,955	25,667	74,306	1,372,486	(2,865)	1,369,622
Capital expenditures *4	466,000	603,640	388,099	68,658	19,153	30,901	1,576,450	(20,631)	1,555,820

*1 "Others" represents service-related businesses such as analysis, physical evaluation and research.

*2 a) "Adjustments" of segment income for the year ended March 31, 2019 of ¥(27,276) million (\$ (245,730) thousand) includes intersegment eliminations of ¥(1,018) million (\$ (9,171) thousand) and corporate expenses of ¥(26,258) million (\$ (236,559) thousand). "Adjustments" of segment income for the year ended March 31, 2018 of ¥(26,207) million includes intersegment eliminations of ¥(1,600) million and corporate expenses of ¥(24,607) million. The corporate expenses consist of the headquarters' research expenses that are not allocated to each reportable segment.

b) "Adjustments" of segment assets for the year ended March 31, 2019 of ¥(59,391) million (\$ (535,054) thousand) includes intersegment eliminations of ¥(79,609) million (\$ (717,198) thousand) and corporate assets of ¥20,218 million (\$ (182,144) thousand). "Adjustments" of segment assets for the year ended March 31, 2018 of ¥(56,640) million includes intersegment eliminations of ¥(77,624) million and corporate assets of ¥20,984 million. The corporate assets consist of the headquarters' research assets that are not allocated to each reportable segment.

*3 "Segment income" is reconciled to operating income.

*4 "Capital expenditures" do not include the increase in assets resulting from inclusion of subsidiaries in consolidation.

4. Related information

a) Geographic information on sales to outside customers

Millions of yen					
2019					
	Japan	Asia		North America, Europe and other areas	Total
		China	Others		
Sales to outside customers	¥ 1,085,701	¥ 426,788	¥ 454,401	¥ 421,958	¥ 2,388,848

Millions of yen					
2018					
	Japan	Asia		North America, Europe and other areas	Total
		China	Others		
Sales to outside customers	¥ 1,005,260	¥ 386,520	¥ 421,456	¥ 391,622	¥ 2,204,858

Thousands of U.S. dollars					
2019					
	Japan	Asia		North America, Europe and other areas	Total
		China	Others		
Sales to outside customers	\$ 9,781,090	\$ 3,844,937	\$ 4,093,703	\$ 3,801,423	\$ 21,521,153

Sales amounts are allocated to countries or regions according to the customers' location.

b) Geographic information on property, plant and equipment

Millions of yen						
2019						
	Japan	Asia		North America, Europe and other areas		Total
		Republic of Korea	Others	U.S.A.	Others	
Property, plant and equipment, net	¥ 331,978	¥ 212,713	¥ 166,506	¥ 131,848	¥ 153,831	¥ 996,876

Millions of yen						
2018						
	Japan	Asia		North America, Europe and other areas		Total
		Republic of Korea	Others	U.S.A.	Others	
Property, plant and equipment, net	¥ 326,679	¥ 199,721	¥ 153,741	¥ 123,042	¥ 123,846	¥ 927,029

Thousands of U.S. dollars						
2019						
	Japan	Asia		North America, Europe and other areas		Total
		Republic of Korea	Others	U.S.A.	Others	
Property, plant and equipment, net	\$ 2,990,793	\$ 1,916,333	\$ 1,500,054	\$ 1,187,820	\$ 1,385,865	\$ 8,980,865

5. Loss on impairment of fixed assets by reportable segment

Millions of yen								
2019								
	Fibers & Textiles	Performance Chemicals	Carbon Fiber Composite Materials	Environment & Engineering	Life Science	Others	Elimination & Corporate	Total
Loss on impairment	¥ 13,322	¥ 1,145	¥ 776	¥ 2,395	¥ 776	¥ —	¥ —	¥ 18,414

Millions of yen								
2018								
	Fibers & Textiles	Performance Chemicals	Carbon Fiber Composite Materials	Environment & Engineering	Life Science	Others	Elimination & Corporate	Total
Loss on impairment	¥ 24	¥ 899	¥ 2,924	¥ 36	¥ 61	¥ —	¥ —	¥ 3,944

Thousands of U.S. dollars								
2019								
	Fibers & Textiles	Performance Chemicals	Carbon Fiber Composite Materials	Environment & Engineering	Life Science	Others	Elimination & Corporate	Total
Loss on impairment	\$ 120,018	\$ 10,315	\$ 6,991	\$ 21,577	\$ 6,991	\$ —	\$ —	\$ 165,892

6. Amortization and balance of goodwill by reportable segment

Millions of yen								
2019								
	Fibers & Textiles	Performance Chemicals	Carbon Fiber Composite Materials	Environment & Engineering	Life Science	Others	Elimination & Corporate	Total
Amortization of goodwill	¥ 1,297	¥ 4,384	¥ 5,054	¥ 864	¥ —	¥ —	¥ —	¥ 11,599
Balance of goodwill	81	10,705	73,337	1,589	—	—	—	85,712

Millions of yen								
2018								
	Fibers & Textiles	Performance Chemicals	Carbon Fiber Composite Materials	Environment & Engineering	Life Science	Others	Elimination & Corporate	Total
Amortization of goodwill	¥ 1,289	¥ 4,186	¥ 2,613	¥ 777	¥ —	¥ —	¥ —	¥ 8,865
Balance of goodwill	7,440	15,094	13,474	4,138	—	—	—	40,146

Thousands of U.S. dollars								
2019								
	Fibers & Textiles	Performance Chemicals	Carbon Fiber Composite Materials	Environment & Engineering	Life Science	Others	Elimination & Corporate	Total
Amortization of goodwill	\$ 11,685	\$ 39,495	\$ 45,532	\$ 7,784	\$ —	\$ —	\$ —	\$ 104,495
Balance of goodwill	730	96,441	660,694	14,315	—	—	—	772,180

20. AMOUNTS PER SHARE

Basic net income per share is computed based on the net income attributable to owners of parent available for distribution to stockholders of common stock and the weighted-average number of shares of common stock outstanding during the year.

Diluted net income per share is computed based on the net income attributable to owners of parent available for distribution to the stockholders and the weighted-average number of shares of common stock outstanding during the year after giving effect to the dilutive potential of shares of common stock to be issued

upon the exercise of warrants and stock acquisition rights.

Amounts per share of net assets are computed based on the net assets available for distribution to the stockholders and the number of shares of common stock outstanding at year end.

Cash dividends per share represent the cash dividends proposed by the Board of Directors applicable to the respective years together with any interim cash dividends paid.

	Yen		U.S. dollars
	2019	2018	2019
Net income attributable to owners of parent:			
Basic	¥ 49.61	¥ 59.97	\$ 0.45
Diluted	49.56	59.90	0.45
Cash dividends applicable to the year	16.00	15.00	0.14
Net assets	706.95	681.92	6.37

21. RELATED PARTY TRANSACTIONS

Year ended March 31, 2019

No items to be reported.

Year ended March 31, 2018

No items to be reported.



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Independent Auditor's Report

The Board of Directors
Toray Industries, Inc.

We have audited the accompanying consolidated financial statements of Toray Industries, Inc. and its consolidated subsidiaries, which comprise the consolidated balance sheet as at March 31, 2019, and the consolidated statements of income, comprehensive income, changes in net assets, and cash flows for the year then ended and a summary of significant accounting policies and other explanatory information, all expressed in Japanese yen.

Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with accounting principles generally accepted in Japan, and for designing and operating such internal control as management determines is necessary to enable the preparation and fair presentation of the consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these consolidated financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in Japan. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. The purpose of an audit of the consolidated financial statements is not to express an opinion on the effectiveness of the entity's internal control, but in making these risk assessments the auditor considers internal controls relevant to the entity's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the consolidated financial position of Toray Industries, Inc. and its consolidated subsidiaries as at March 31, 2019, and their consolidated financial performance and cash flows for the year then ended in conformity with accounting principles generally accepted in Japan.

Convenience Translation

We have reviewed the translation of these consolidated financial statements into U.S. dollars, presented for the convenience of readers, and, in our opinion, the accompanying consolidated financial statements have been properly translated on the basis described in Note 2.

Ernst & Young ShinNihon LLC

June 25, 2019
Tokyo, Japan

Investor Information

(As of March 31, 2019)

Common Stock:

Issued: 1,600,694,991 shares
(excluding treasury stock)

Number of Stockholders: 176,504

Annual General Meeting:

The annual general meeting of stockholders is normally held in June in Tokyo.

Listings:

Common stock is listed on the Tokyo Stock Exchange.

Independent Auditor:

Ernst & Young ShinNihon LLC

Transfer Agent:

Sumitomo Mitsui Trust Bank, Limited
1-4-1, Marunouchi Chiyoda-ku, Tokyo
100-0005, Japan

Cash Dividends Per Share

	FY 2018	FY 2017
Total for the year	¥16.00	¥15.00
Interim	8.00	7.00

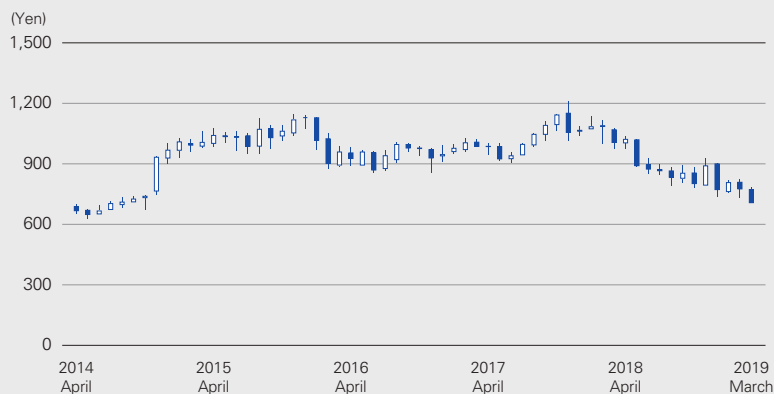
Principal Stockholders

	Shares held	Percentage of shares held*1
The Master Trust Bank of Japan, Ltd. (Trust Account)	131,980,000	8.25
Japan Trustee Services Bank, Ltd. (Trust Account)	93,983,844	5.87
Nippon Life Insurance Co. Ltd.	71,212,250	4.45
Mitsui Life Insurance Co., Ltd.*2	35,961,000	2.25
National Mutual Insurance Federation of Agricultural Cooperatives	32,193,000	2.01
Japan Trustee Services Bank, Ltd. (Trust 5 Account)	29,813,300	1.86
Sumitomo Mitsui Banking Corporation	27,022,000	1.69
Japan Trustee Services Bank, Ltd. (Trust 4 Account)	25,856,800	1.62
Japan Trustee Services Bank, Ltd. (Trust 9 Account)	25,404,900	1.59
JP Morgan Chase Bank 385151	23,565,640	1.47

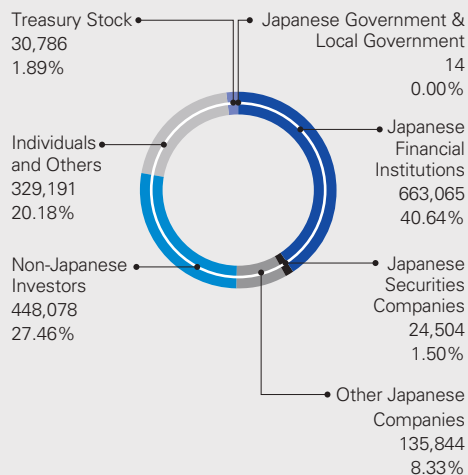
*1 Percentage of shares held is calculated excluding 30,786,412 shares of treasury stock.

*2 Mitsui Life Insurance Co., Ltd. was renamed TAIJU LIFE INSURANCE COMPANY LIMITED on April 1, 2019.

Stock Price Range



Composition of Stockholders (Thousands of shares)



Corporate Data

(As of March 31, 2019)

Toray Industries, Inc.

Head Office

Nihonbashi Mitsui Tower, 1-1,
Nihonbashi-Muromachi 2-chome,
Chuo-ku, Tokyo 103-8666, Japan
Telephone: 81 (3) 3245-5111
Facsimile: 81 (3) 3245-5054
URL: www.toray.com

Established:

January 1926

Paid-in Capital:

¥147,873,030,771

Number of Employees:

48,320

Parent company: 7,585

Japanese subsidiaries: 10,563

Overseas subsidiaries: 30,172

 TORAY REPORT 