

# NTN Report 2019

For the fiscal year ended March 31, 2019



# NTN®

For New Technology Network



# Make the World

# “NAMERAKA”\*

Bearing technology is used to smoothen the rotating parts of all types of machines. With more precise bearing technology, shafts can rotate smoother, minimizing energy loss. Bearings are thus a technology for saving energy. The technology developed with bearings will smoothly change the future of electric vehicles, robots and even society based on natural energy.

\* “NAMERAKA” means “smooth” in Japanese.



The Founders' Spirits that NTN has embraced since its founding in 1918 are the Frontier Spirit, which encourages us to keep challenging, and the Coexistence and Co-prosperity Spirit, which encourages us to develop together with society. These Founders' Spirits were incorporated into the corporate philosophy as NTN's DNA, and have been passed down to the employees for over 100 years.

In order to put the corporate philosophy into practice, NTN Group employees use the NTN SPIRIT, the mindset and actions they are to aim for, as a cornerstone of their own work.

By putting our corporate philosophy into practice, we aim to help solve global social issues through our technical expertise and services, and achieve a sustainable smooth society.



### Corporate Philosophy

We shall contribute to international society through creating new technologies and developing new products.

## For New Technology Network

- 1 Creation of original technologies.
- 2 Offering the technologies for additional values and service that are suitable for each customer and end user.
- 3 Improvement of employees' standard of living, distribution of fair returns to stockholders, and contribution to society based on the steady growth of our business.
- 4 Promotion of globalization, and formation of management systems/corporate organization which are essential for NTN, as an international leading company.

### NTN SPIRIT

Credos		Guidelines	
<b>Challenge</b>	Buds appear when we challenge with frontier spirit		<ul style="list-style-type: none"> <li>We challenge passionately without being satisfied with the current situation.</li> <li>We respond quickly to any changes, emphasizing on-site verification.</li> <li>We enrich our lives by thinking, acting with initiative and continuing to grow.</li> </ul>
<b>Collaboration</b>	Leaves grow through the spirit of collaboration with coexistence and co-prosperity		<ul style="list-style-type: none"> <li>We accept and respect differences in each other.</li> <li>We help each other, treating all associates honestly.</li> <li>We take care of the natural environment and maintain coexistence with local community.</li> </ul>
<b>Commitment</b>	Flowers bloom and fruits grow through fulfilling our commitments		<ul style="list-style-type: none"> <li>We maximize the quality of work aiming for first-class quality under safety-first policy.</li> <li>We intend to be the strongest partner delivering customer delight beyond satisfaction.</li> <li>We support improving lives of people around the world through our work.</li> </ul>

## Achieving a Smooth Society

#### Editorial Policy

NTN believes that the active disclosure of management plans and business results, as well as its basic policy for corporate social responsibility (CSR), CSR activities, and environmental preservation initiatives, among other information, will help garner the understanding and support of all stakeholders. This "NTN Report," which has been issued since the fiscal year ended March 31, 2010 after combining the "Annual Report" with the "CSR Report," is part of this active approach to information disclosure.

#### Organization Covered and Reporting Period

**Reporting period:**  
Fiscal year ended March 31, 2019 (April 1, 2018 to March 31, 2019)  
Includes some activities for the fiscal year ending March 31, 2020.  
The earning forecast of fiscal year ending March 31, 2020 reflects the content revised in July 2019.

**Organization covered:**  
NTN Group  
Includes some reports for NTN only.

#### Reference Guidelines

International Integrated Reporting Council (IIRC)  
International <IR> Framework  
  
Ministry of Economy, Trade and Industry  
Guidance for Integrated Corporate Disclosure and Company-Investor Dialogues for Collaborative Value Creation

#### Disclaimer

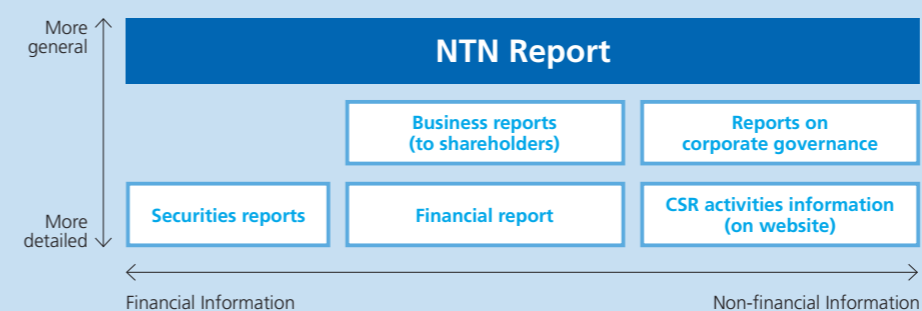
This report contains future results and forecasts regarding NTN's future plans, strategies, and business results. Please understand that actual business results may vary from the forecasts made herein by the Company.

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\*About product photos: some photos are cross-sectional models of products

#### Types of Information Provided by NTN



This report presents both financial and non-financial information, focusing on especially important topics. More detailed financial information is available in the securities reports and in Financial Reports. Detailed information on the Company's CSR activities is also available on our website.

<https://www.ntnglobal.com/en/index.html>

# A Century in Business

Since its founding, NTN has maintained the quality-first approach, and built up reputation and achievements with its high technological expertise. We will continue to contribute to international society through creating new technologies and developing new products.

## 1918 Start of ball bearing research and manufacturing at Nishizono Ironworks

Young engineer Jiro Nishizono started the Nishizono Ironworks in Kuwana, Mie Prefecture in 1918 at the age of 21. Noboru Niwa (later the Company's first president) was running a machinery and tool shop called Tomoe Trading Co. that he had started in Osaka at the age of 22.

In 1922, when Japan was tackling the challenge of domestic production of bearings, Tomoe Trading Co. successfully bid for an entire cargo of bearings that had been aboard a Swedish vessel that sank in Japan. Niwa had had business with Nishizono Ironworks before, and asked them to refurbish the bearings. Niwa sold the bearings and bought grinders with the proceeds of the sale. Bearing manufacturing got fully underway. The Company's products have carried the NTN logo, which stands for Niwa, Tomoe Trading and Nishizono, since the start of the production.



Noboru Niwa



The bearing at the time of the start of the business



Jiro Nishizono

## 1927 Establishment of NTN Mfg. Co., Ltd. with capital of 50,000 yen



## 1963 Start of driveshaft manufacturing

Technology partnership was formed with UK manufacturer Hardy Spicer to produce driveshafts (constant velocity joints), a promising product expected to enjoy rapid future growth in demand for automotive applications, and production started at the Kuwana Plant.



First driveshaft model produced



## 1964 NTN supplies journal bearings for the first 0 Series Shinkansen trains

The Company has helped enable faster and lighter rolling stocks by developing technology tailored to the evolution of high-speed rail and providing high-quality, high-reliability products.

NTN's products have been adopted for the first 0 Series Shinkansen as well as the latest model Shinkansen. Our journal bearings for 0 Series Shinkansen trains were recognized as Tribology Heritage\* by the Japanese Society of Tribologists.

\*Tribology Heritage: Tribology related technology and things recognized by the Japanese Society of Tribologists as having a particularly important contribution to the development of science and technology

## 1960~1970s Overseas sales and production expansion/augmentation

The latter half of the 1970s saw the Company release its axle bearings (GEN1) that were the forerunners of our hub bearings that now have the world's No.1 market share. In the 1980s, these products evolved into hub bearings (GEN2) by combining the axle bearings with peripheral components such as knuckles in a single unit. The evolution into GEN3 was subsequently accomplished by packaging additional parts such as hub bolts, flanges and knuckles into a single unit to improve ease of assembly on automobile assembly lines. The GEN3 began mass-production in Japan for the first time in the mid-1980s.

## The latter 1970 Evolution of hub bearings

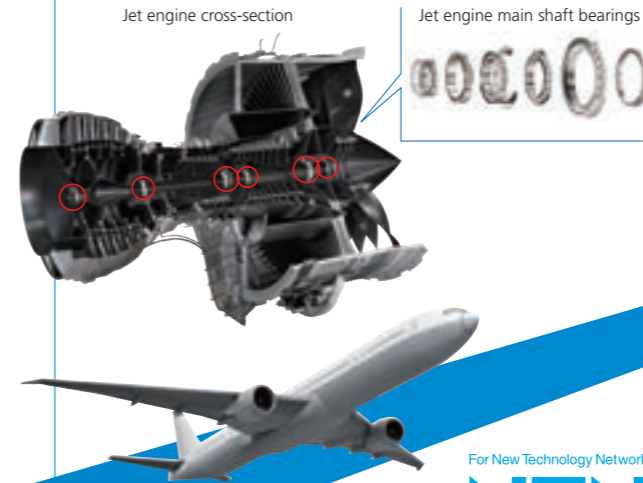
The third-generation lineup has continued to evolve. Refinements are still being made today, such as by adding sensors and improving ease of assembly.



GEN3

## 1986 Construction of Japan's first aerospace bearing plant

NTN has been producing bearings for aerospace applications with high function and high quality. We are a certified supplier of main shaft bearings to the world's four major jet engine manufacturers, a currently unrivaled achievement among Japanese manufacturers.



Jet engine cross-section

Jet engine main shaft bearings

## 1989 Name changes to NTN Corporation

The Company was renamed "NTN Corporation," representing "For New Technology Network," which was adopted as a new direction the Company should moving forward to.



NTN corporation

## 2008 SNR ROULEMENTS acquisition

Seeking to expand business in the European market, the Company invested in French bearing manufacturer SNR ROULEMENTS in 2007, making it a consolidated subsidiary the following year.

The addition of SNR ROULEMENTS to the NTN Group has boosted European sales, making our business development more geographically balanced, with sales from Japan, the Americas, Europe, and Asia and other regions each accounting for approximately 25% of the total.



Current head office building

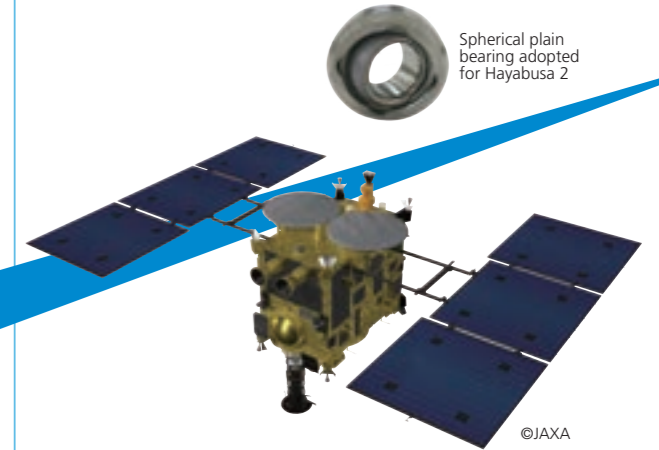


NTN-SNR ROULEMENTS (Current head office building)

## 2014 Provision of bearings to the Hayabusa 2 asteroid probe

The H-IIA Launch Vehicle No. 26 with the Asteroid Explorer Hayabusa 2 onboard was launched from the Tanegashima Space Center.

Our spherical plain bearings are used in the hinges that open the solar panels on the Hayabusa 2 in outer space, contributing to the successful completion of Hayabusa 2's mission in outer space.



Spherical plain bearing adopted for Hayabusa 2

©JAXA

## 2018 Company's 100th anniversary

NTN celebrated its 100th anniversary on March 1, 2018, and took the opportunity to launch a communication keyword: "Make the World NAMERAKA, NTN."\*

We are putting out products including bearings on the market that move machines smoothly. We will continue our efforts to achieve a smooth society by smoothing the lives of people and society around us. In order for sustainable growth over the next 100 years, we also established our long-term vision, and to realize it, created a Medium-term Management Plan "DRIVE NTN100."

\*"NAMERAKA" means "smooth" in Japanese.



## 1937 Name changes to the Toyo Bearing Mfg. Co., Ltd.



Old head office building

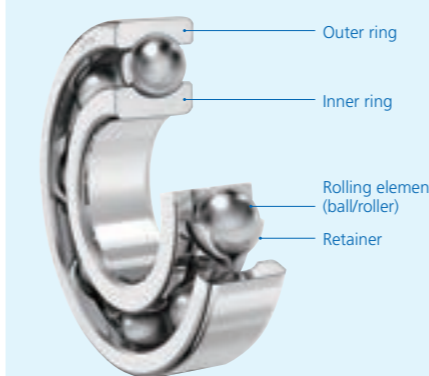
## 1954 NTN becomes the first Japanese machinery manufacturer to win the Deming Prize\*

The Deming Prize is one of the world's most prestigious awards for TQM (total quality management). NTN is not only the first bearing manufacturer, but also the first Japanese machinery manufacturer to win the award. The Company was one of the first machinery manufacturers to adopt statistical quality control, and the quality control was applied throughout the Company. This effort was recognized by this honor.



\*Deming Prize: A prize created by the Japanese Union of Scientists and Engineers to honor the achievements of W. Edwards Deming, a US engineer, statistician, professor, author, lecturer, and management consultant who popularized statistical quality control in postwar Japan and built the foundation needed to raise the quality of Japanese products to world standards.

### About Bearings



Bearings are eco-products that reduce energy consumption by supporting various rotating mechanical parts and reducing friction.

The coefficient of friction of a smoothly rotating bearing is 0.001. This means that you can move a 1,000kg object placed on the ground with a force of pulling an approximately 1kg object. Use of bearings makes it possible to move things with a light force, contributing to reduce energy consumption.

Bearings are mounted inside machinery and are usually hidden from view. But they play a key role in improving the safety and reliability of machinery, helping contribute to "NAMERAKA\* Society."

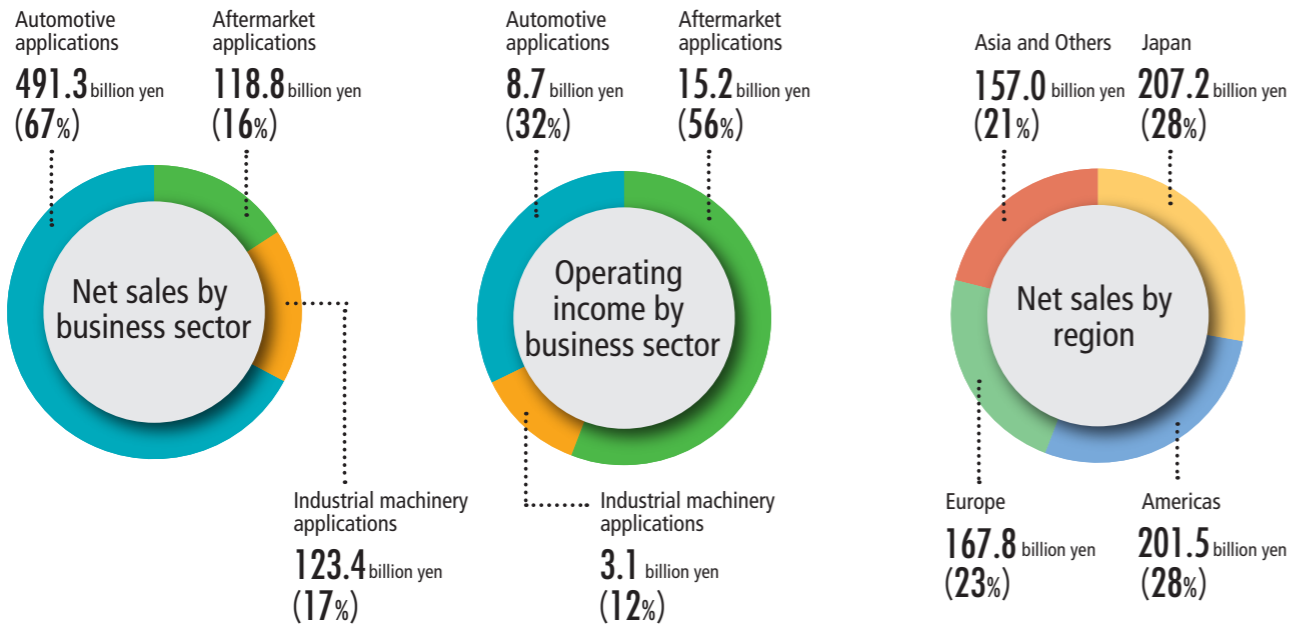
General-purpose bearings are composed of four types of components: an outer ring, inner ring, rolling elements (balls/rollers) and retainers. While the structure seems simple, any irregularities or cracks in the rings or rolling elements will prevent the bearing from turning smoothly. Every ball used in bearings must be manufactured with a high degree of technological expertise and enough precision to ensure that irregularities will vary by less than one ten thousandth of a millimeter.

\*"NAMERAKA" means "smooth" in Japanese.

# Revenue Structure, Main Products

Net Sales **733.6** billion yen    Operating Income **26.9** billion yen

Fiscal year ended March 31, 2019



## Aftermarket applications

P.31-32

<b>Mining machinery</b> <p>Spherical roller bearings with reinforced retainers</p>	<b>Metal industry equipment</b> <p>Sealed four-row tapered roller bearings</p>	<b>Paper-making machinery</b> <p>ULTAGE spherical roller bearings Type EA, Type EM</p>	<b>Food processing machinery</b> <p>PolyLube sealed bearings for food processing machinery</p>	<b>Cement equipment</b> <p>Plummer blocks</p>
<b>Auto parts</b> <p>Part kits with combinations of several bearings</p>		<b>Technical training / maintenance tools</b> <p>Induction heater Self-centering hydraulic puller with arms Technical service units</p>		

## Industrial machinery applications

P.33-34

<b>Construction machinery</b> <p>Applications for resource mining and civil engineering</p>	<b>Gearboxes</b> <p>Helping ensure high robot productivity</p>	<b>Agricultural machinery</b> <p>Helping ensure stable food supplies</p>	<b>Wind turbines</b> <p>Meeting growing renewable energy demand</p>	<b>Aerospace</b> <p>Used for worldwide jet engine applications</p>
<b>Machine tools</b> <p>Helping ensure high machining precision</p>	<b>Rolling stock</b> <p>Helping ensure safety of worldwide high-speed railways</p>	<b>Office equipment</b> <p>Helping ensure smooth copier/multifunctional printer operation</p>	<b>Electronic devices</b> <p>Used for hard drive and thin fan motor applications</p>	<b>Medical equipment</b> <p>CT scanner and artificial heart applications</p>

## Automotive applications

P.35-36

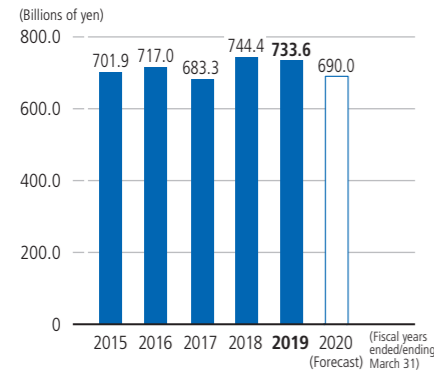
<b>[Engines]</b> Split needle roller bearings (for camshafts) High-density, high-strength sintered gears for starter motors Pulley bearings for high-speed rotation	<b>[Accessories]</b> Auto tensioner with the variable damper mechanism for ISG-equipped engine Mechanical clutch units for next-generation steering systems
<b>[Automatic / manual transmissions]</b> Needle roller bearings for rocker arms Long-life series TAB bearings ULTAGE tapered roller bearings for automotive applications BEAREE seal rings Thrust needle roller bearings	<b>[Steering components]</b> Clutches for seat lifters
<b>[Axle/Drivetrain]</b> Ball screw drive modules for electric hydraulic brakes Needle roller and cage assembly bearings for planetary gear	<b>[Seats]</b> Hub bearings Driveshafts
<b>[Brakes]</b> Ball screw drive modules for electric hydraulic brakes	<b>[Transmissions] CVTs</b> Needle roller and cage assembly bearings for planetary gear

# Financial / Non-Financial Highlights

## Financial Capital

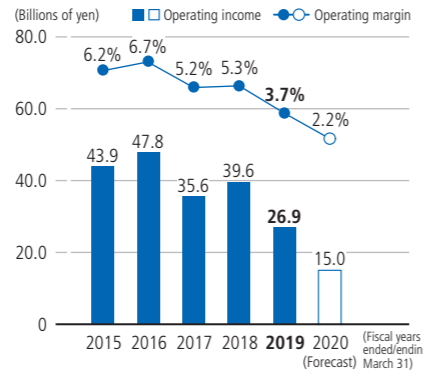
### Net Sales

**733.6** billion yen



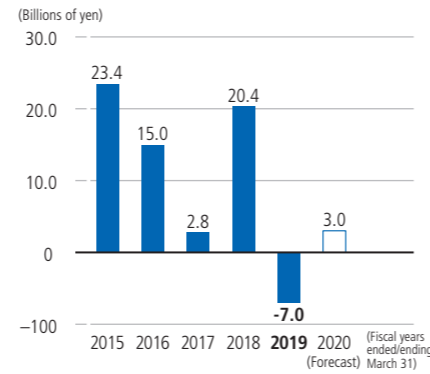
### Operating Income/Operating Margin

Operating income **26.9** billion yen  
Operating Margin **3.7** %



### Net Income (Loss) Attributable to Shareholders (parent company)

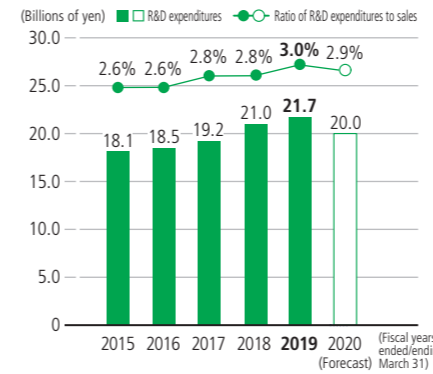
**-7.0** billion yen



## Non-financial Capital

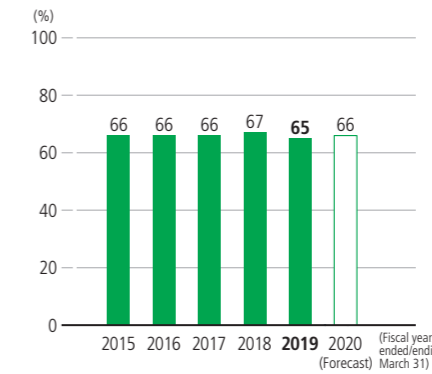
### R&D Expenditures; Ratio of R&D Expenditures to Sales

R&D expenditures **21.7** billion yen  
Ratio of R&D expenditures to sales **3.0** %



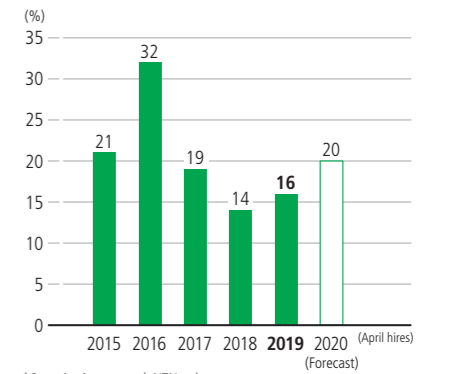
### Percentage of Employees Overseas

**65** %



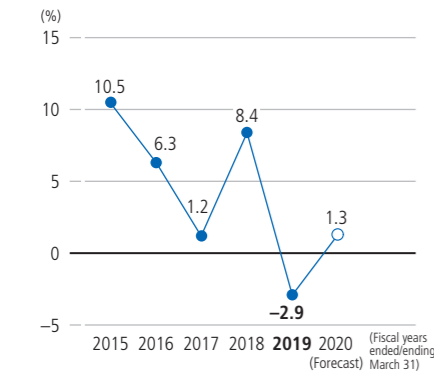
### Percentage of Hired Female Graduates\*

**16** %



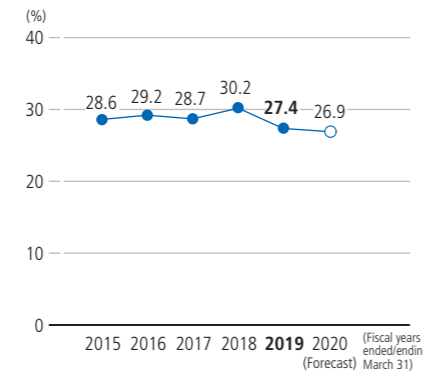
### Net Income (Loss)/ Average Shareholders' Equity (ROE)

**-2.9** %



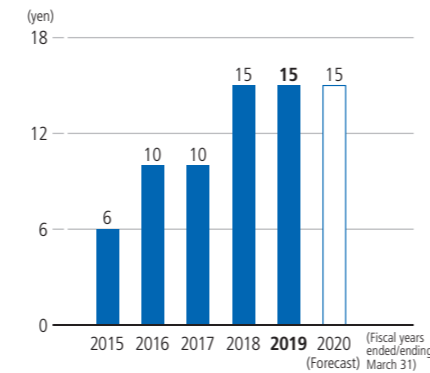
### Equity to Capital Ratio

**27.4** %



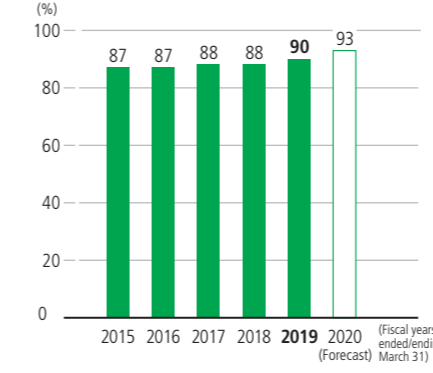
### Cash Dividends

**15** yen



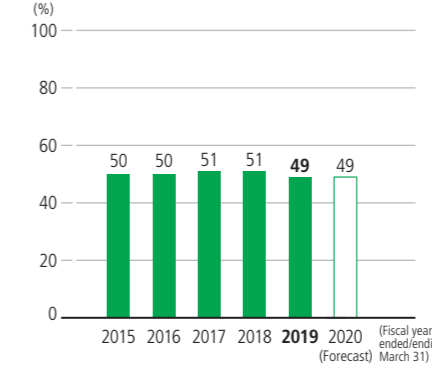
### Ratio of Local Procurement

**90** %



### Ratio of Overseas Production

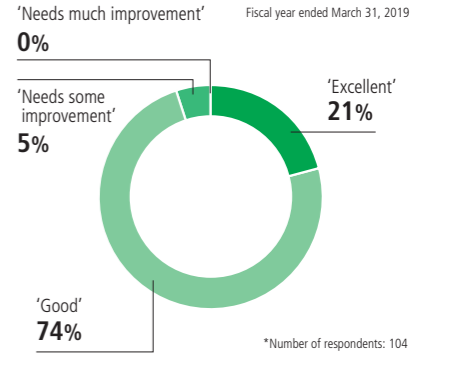
**49** %



### Customer Satisfaction Survey Responses

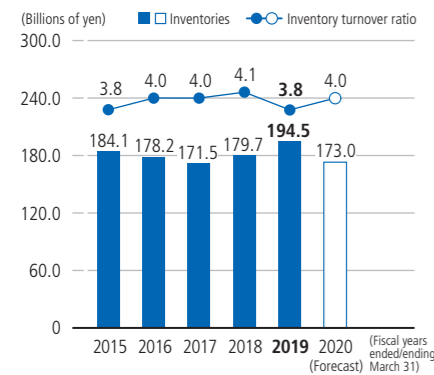
Either 'Excellent' or 'Good'

**95** %



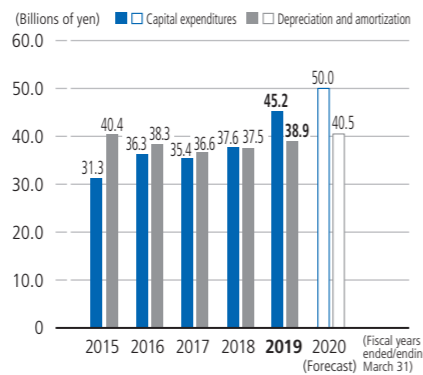
### Inventories / Inventory Turnover Ratio

Inventories **194.5** billion yen  
Inventory Turnover Ratio **3.8**



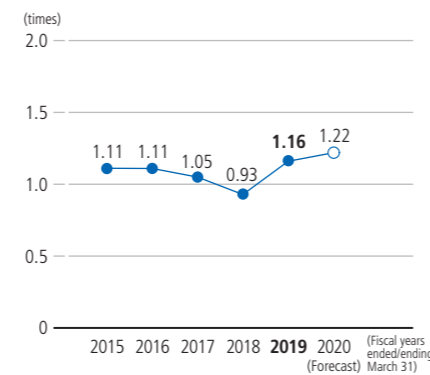
### Capital Expenditures / Depreciation and Amortization

Capital Expenditures **45.2** billion yen  
Depreciation and Amortization **38.9** billion yen



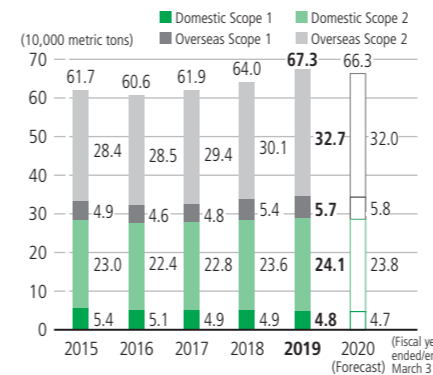
### Net D/E Ratio

**1.16** times



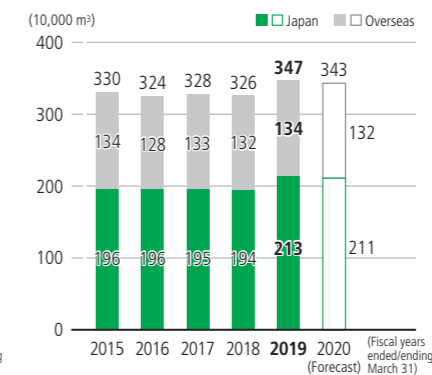
### CO2 Emissions [Scopes 1 and 2]

Domestic Scope 1 **48,000** metric tons  
Domestic Scope 2 **241,000** metric tons  
Overseas Scope 1 **57,000** metric tons  
Overseas Scope 2 **327,000** metric tons



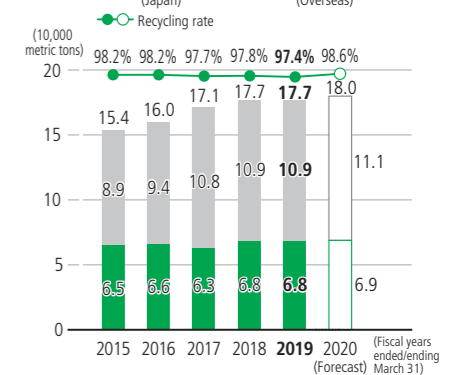
### Water Consumption (Japan/Overseas)

Japan **2.13** million m<sup>3</sup>  
Overseas **1.34** million m<sup>3</sup>



### Waste Quantities and Recycling Rates (Japan/Overseas)

Generated waste **177,000** metric tons  
Recycling rate **97.4** %



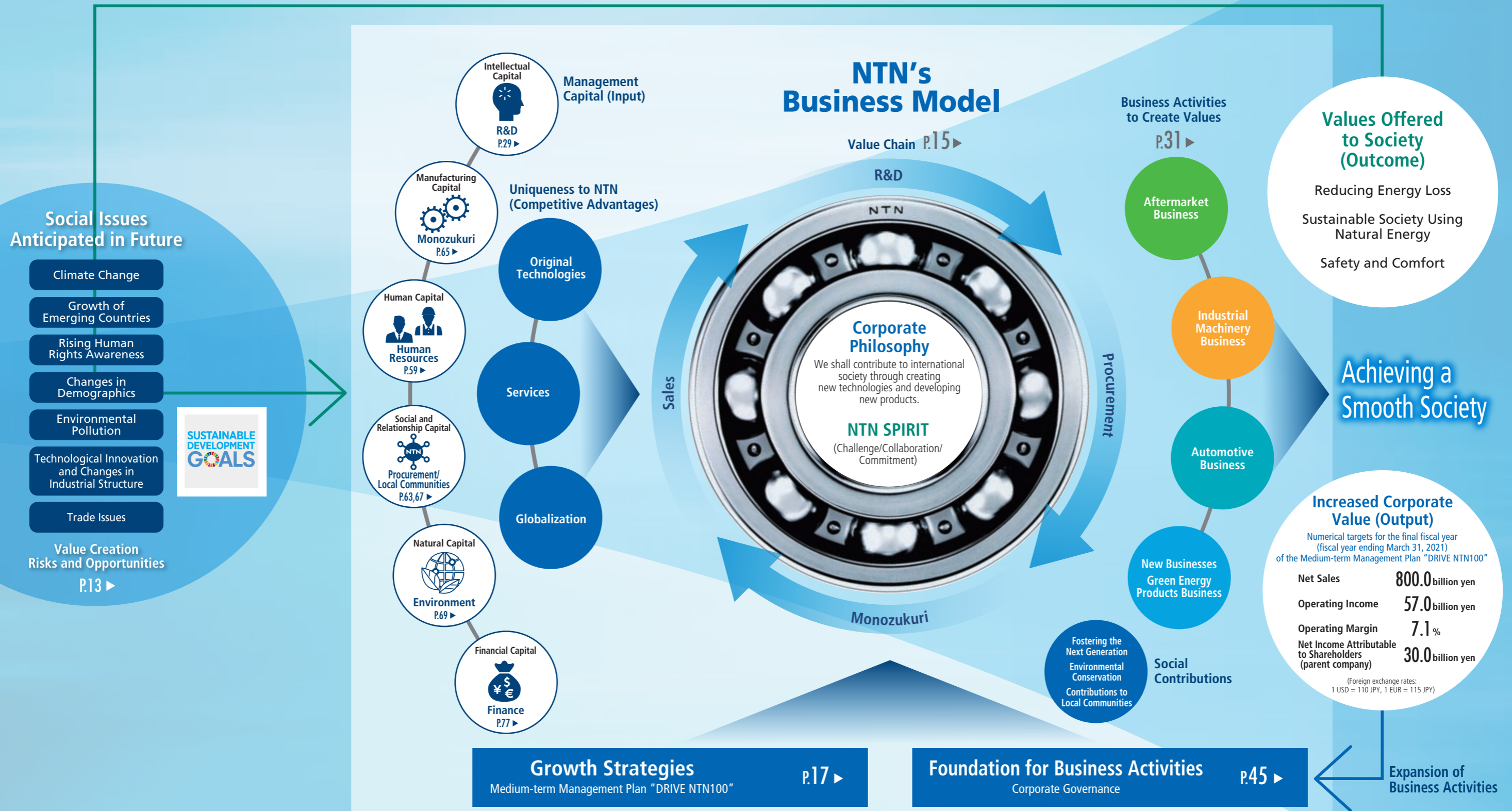
# Value Creation Process

Based on our corporate philosophy, we create products such as bearings and driveshafts by applying the resources we have accumulated over our 100-year history since our foundation to a value chain consisting of "R&D", "Procurement", "Monozukuri" and "Sales" processes.

Our business activities help bring solutions to social issues while providing value to all our stakeholders. These activities are also designed to further improve our corporate value through reinvestment of applied resources.

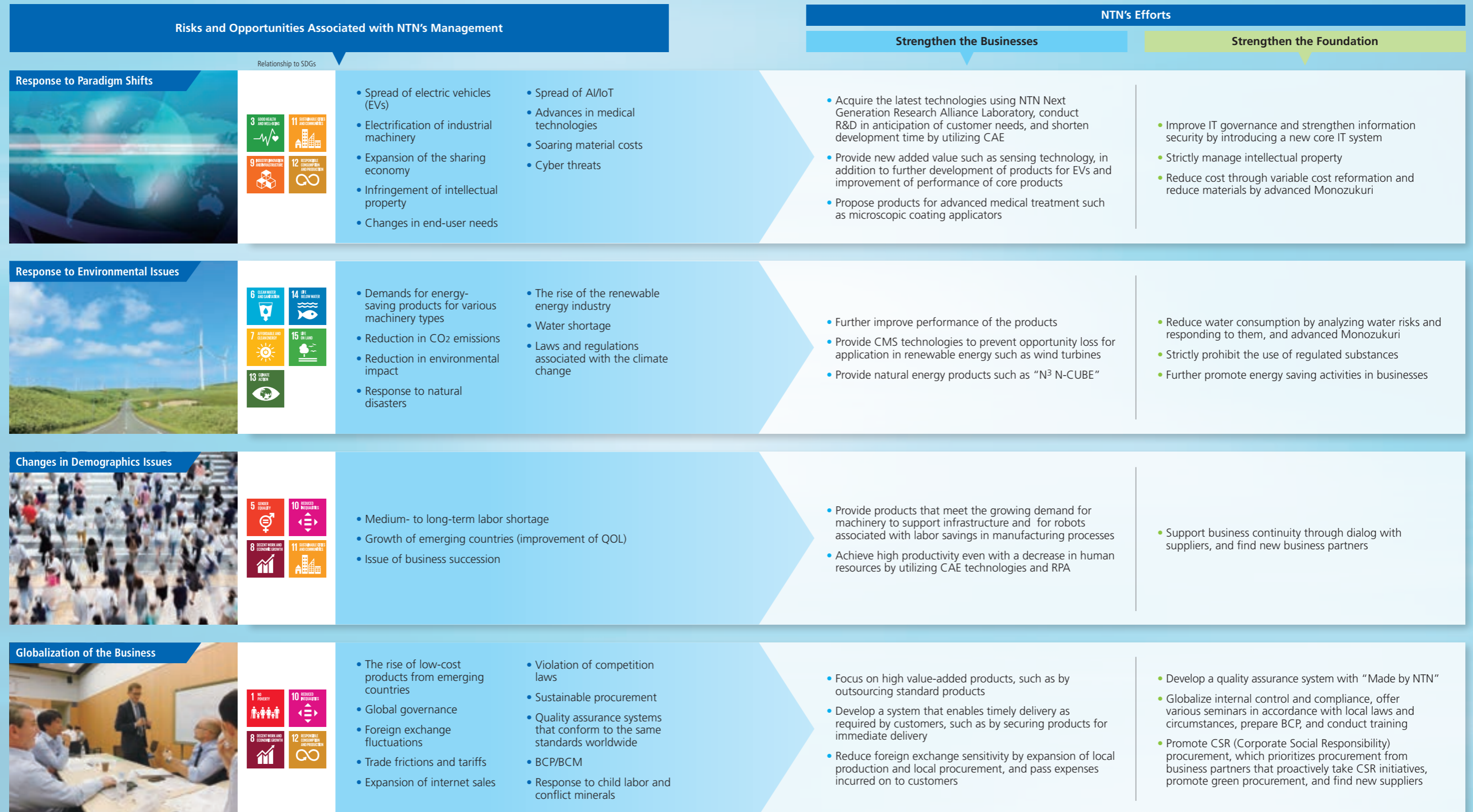
NTN will continue working to achieve a smooth society by making proposals for ensuring sustainable society.

Providing Solutions to Social Issues



# Value Creation Risks and Opportunities

The NTN Group is aware of social issues anticipated in the future, such as the climate change, growth of emerging countries, rising human rights awareness, changes in demographics, environmental pollution, technological innovation and changes in industrial structure, and trade issues as well as Sustainable Development Goals (SDGs), and is therefore working to strengthen its business activities and foundation that supports them to respond to the risks and opportunities surrounding its businesses. These measures not only enable sustained growth of the Group's businesses, but also help bring solutions to social issues.





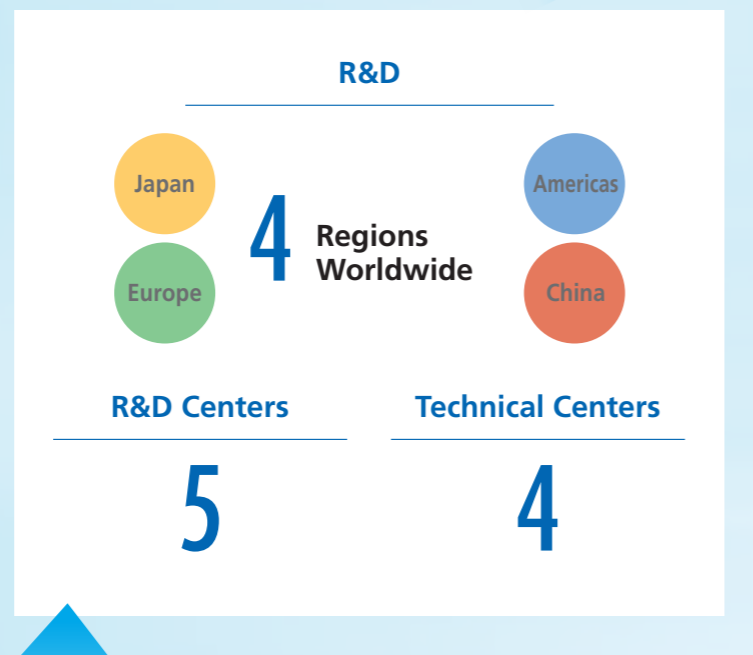
## Value Creation in the Value Chain

The Company's corporate philosophy is "We shall contribute to international society through creating new technologies and developing new products." Based on this philosophy, we are investing the capital acquired over our 100 year history since our foundation in the value chain and working on R&D, procurement, Monozukuri and sales activities to contribute to international society.

The interactions among each business process enable sustainable growth by keeping the cycle of value chain processes flowing.

### R&D p.29-30 ▶

The Company's R&D focuses on tribology technology and is divided among four regions throughout the world. Each region shares information with each other on areas such as design, prototyping, testing, production technology and customer projects, rapidly responds to customer needs they identified, and creates value-added products. We are moving into new business areas by refining our product structure; from individual bearings to "module products" that incorporate sensors and other peripheral technologies, and "system products" that combine mechatronics and control technologies. In October 2018, we established CAE R&D Center to aim for higher efficiency and higher precision of our R&D activities.



### Sales p.31-36 ▶

Representatives from our sales divisions regularly visit customer development sites and perform consultative sales activities by precisely coordinating among customers and related-divisions within the Company. They propose products and provide consultations to solve issues to meet the needs for the new products that the customers are developing, and respond to any problems with existing models that are being mass produced.

Representatives from sales engineering divisions provide technical services required to solve issues by rapidly identifying technical needs of the customers.

As for the products of which we have started mass-production and delivery, we are working to maintain optimal stock levels for customer production plans and extensive lineups. We also make efforts to further improve customer satisfaction by providing after-sales technical services including on-site visits to hold seminars that explain topics such as bearing handling methods for the customers who will actually use our products.

Customer needs and requirements are constantly evolving: products' weight reduction, quietness, lower torque for energy saving and longer operating life. We respond promptly to those needs, and deliver our high quality products to customers at appropriate prices, in an effort to improve trust and satisfaction in NTN brand. We conduct regular surveys with our Customers. Those are opportunities to evaluate their satisfaction and to receive requests or other feedbacks from them.

#### Number of visits made with technical service units

584

We visit customers with technical service units and provide them with technical services.

#### Ratio of 'Excellent' and 'Good' in the customer satisfaction survey responses

95%

We have achieved great customer satisfaction.

#### Ratio of local procurement

90%

#### CSR questionnaires to suppliers

Implemented at 489 business partners

We work on sustainable procurement by promoting CSR activities throughout the entire supply chain.

### Procurement p.63-64 ▶

We implement procurement activities based on the "Basic Procurement Policy" that was established from perspectives of "globalization," "fairness/impartiality," and "environmental preservation." We engage in "Green Procurement," giving priority to suppliers with outstanding environmental preservation work or environmental quality. We also work to promote procurement in local and the optimal regions. Guided by the "NTN CSR Procurement Guidelines" we have created, we actively encourage suppliers to take part in CSR activities to promote CSR throughout the entire supply chain. We are working to establish and strengthen partnerships with suppliers through improving our communication with them.

#### Ratio of overseas production

49%

#### Quality management system certifications at consolidated subsidiaries

100%

All mass-production plants from our consolidated subsidiaries have received the proper Quality System Management Certification.

### Monozukuri p.65-66 ▶

With customer satisfaction as our top priority, we aim to further improve our QCD (Q: Quality / C: Cost / D: Delivery). As a production reformation activities, we will create a structure for total optimization and promote production streamlining, which will lead to improving profitability of NTN as a whole. We will bring Monozukuri sites and customers closer to each other and deliver high value to customers through advanced and efficient production utilizing robots and AI/IoT, and through SCM (Supply Chain Management) collaboration. With our overseas production facilities, we are working on strictly reapplying rules for model transfers and process changes. We are also strengthening risk analysis and data management from the first steps of product developments. Our target is to ensure stable quality from the very start of production, using NTN global quality assurance system and standards. We are providing support from Mother-Plants and Quality Control Division to perform on-site audit, to investigate past problems, to implement process improvements and to ensure quality guidance for local employees. Developing and producing our manufacturing equipment in-house lets us expand on NTN's proprietary expertise, while our proactive approach to human resources training ensures that this expertise passes to the next generation of employees.

# Medium-term Management Plan "DRIVE NTN100"

We started the Medium-term Management Plan "DRIVE NTN100" in April 2018.

By integrating latest technologies (Digitalization) into the management resources that NTN has cultivated (Resources), we aim to develop innovative technologies, products, and services (Innovation), accelerate global procurement and centralized purchasing (Variable cost reformation), and achieve the world's highest productivity and quality and improved efficiency in asset management (Efficiency improvement). With acceleration of these elements, NTN will realize "Our Vision" and achieve our target in 10 years.

## Initiatives realizing "Our Vision"

To enable sustainable growth over the next 100 years, we have created a long-term vision.

In order to realize "Our Vision," we will pursue competitive advantages by strengthening our core technologies and products, while developing businesses in new areas by harnessing our core technologies and R&D achievements.

We are also stepping up our development speed by proactively collaborating with outside partnerships, while enabling sustainable growth by creating a more robust business bases to support these new business areas.

### Our Vision

- 1 A company where its corporate philosophy is understood by all employees around the world and where all employees think and act for themselves
- 2 A company with original new products and services, appreciated for its high quality and functions, and has a global presence
- 3 A company where everyone involved with NTN will be able to be proud of the "NTN" brand



## 10 year targets

Before creating our three-year Medium-term Management Plan which we started in April 2018, we set targets to be achieved in the following 10 years after the plan. These 10 year numerical targets were set with the aim of transforming from a "Manufacturing Company" into a "Company that Delivers Value to Customers through Products and Services."

In order to achieve these targets, we will approach changes in the external environment as growth opportunities and respond to new market needs while strengthening our core

technologies and products to transform our business structure.

Our automotive and industrial machinery business is working on strengthening core business areas and responding to new customer needs. Our aftermarket business is expanding our technical services to shift the business focus from products to services.

We will also work on growing our natural energy product segment and other new business areas that provide solutions to social issues.

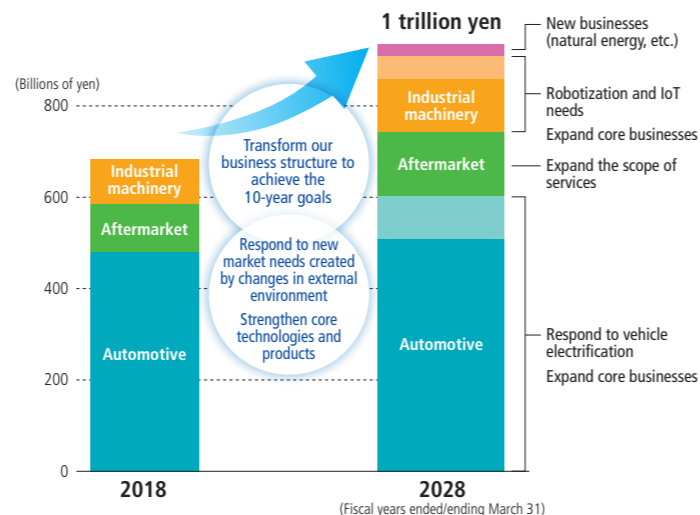
## Transform from a "Manufacturing Company" into a "Company that Delivers Value to Customers through Products and Services"

### Changes in external environment

- Automotive industry**  
A change that occurs only once a century (CASE)
- Industrywide**  
IoT, robotization, and AI
- Social Issues**  
Population increase, climate change, resource depletion, poverty, starvation, etc. (SDGs)

### Numerical targets

<b>Net sales</b>	1 trillion yen or more
<b>Operating margin</b>	10% or more
<b>Total asset turnover</b>	1.0 or more
<b>Exchange rate sensitivity</b>	To be halved from the current level



## Drive forward the transformation of business structure for the next 100 years

~ **DRIVE NTN Transformation for New 100** ~  
April 2018 to March 2021

Numerical targetstargets			
Net Sales	800.0 billion yen	Operating Margin	7.1%
Operating Income	57.0 billion yen	Net Income Attributable to Shareholders (parent company)	30.0 billion yen
(Foreign exchange rates: 1 USD = 110 JPY, 1 EUR = 115 JPY)			

## Business targets and policies

Sustainable growth by developing businesses in new areas and strengthening core technologies and products

Business Area	Target	Tasks	Actions
<b>Aftermarket Business</b> ▶ P.31-32	Transform our business from products to services, or from selling bearings to providing services → Utilize bearing sensing technology for industrial machinery business	<ul style="list-style-type: none"> <li>Enhance brand power through the expansion of MRO* sales</li> <li>Expand aftermarket part lineup to not miss sales opportunities</li> </ul>	<ul style="list-style-type: none"> <li>Continue to improve technical services including maintenance</li> <li>Establish a production system independent of OEM business, and maintain sufficient quantities of aftermarket parts in stock</li> </ul>
<b>Industrial Machinery Business</b> ▶ P.33-34	NTN will become a company that customers in the industrial machinery market rely on most for its exceptional technological competence	Strengthen core businesses and products	Develop businesses in new areas
		<ul style="list-style-type: none"> <li>Further development of core technologies; development of high-performance products</li> </ul>	<ul style="list-style-type: none"> <li>Robot-related business (robotics)</li> <li>Service, solutions business</li> </ul>
<b>Automotive Business</b> ▶ P.35-36	As an indispensable presence for the automotive market, NTN will become a company that offers products and services for vehicles all over the world	Strengthen core businesses and products	Develop businesses in new areas
		<ul style="list-style-type: none"> <li>Become the world's top maker of drive-train systems (including EVs)</li> </ul>	<ul style="list-style-type: none"> <li>Respond to electrification and EVs</li> </ul>

\*MRO: Maintenance, Repair and Overhaul

## Strengthen management bases that support our businesses

Focus for the next three years on strengthening management bases that support our businesses

Strengthen management bases that support our businesses	Changes in external environment	New market needs	New competitive environment
	CASE, robotization, IoT, AI Declining population in Japan	Develop businesses in new areas	Improve profitability Business expansion without the need for additional workforce Improve efficiency in asset management
<b>Variable Cost Reformation</b>	Build a procurement network that supports the expansion of global production capacity and the utilization of external production capacity Reduce external procurement cost	<b>Goals for effects of variable cost reformation</b> 3rd year: 3.0 billion yen on top of conventional cost reductions 10th year: 30.0 billion yen on top of conventional cost reductions	
<b>Structural Reform of Man-Hours and Resources</b>	Use IoT, AI, and robots to take care of part of operations in the manufacturing divisions Introduce RPA to improve the quality of operations in back office divisions	<b>3-year goals for reductions in personnel expense</b> Manufacturing divisions: 1.0 billion yen Technical and administrative divisions: 0.5 billion yen	
<b>Enhance Supply Chain Management</b>	Utilize the new IT core system Efficient inventory holdings and reducing lead time		
<b>Concentrated Investment</b>	Intensively investing management resources in processes in which our technical strengths can be demonstrated Proactively utilizing outsourcing		



## Management Commitment

# The First Step toward a New 100 Years A Sign for Achieving a Smooth Society

The fiscal year ended March 31, 2019 was a difficult year where we saw a net loss for the first time in five years. The main factor was the impairment of domestic fixed assets reflecting the worsened business environment. We intend to steadily improve our business structure to make a leap forward through continuing challenge to “transform” while implementing structural reforms in manufacturing divisions in Japan.

Director  
Representative Executive Officer, President, Executive Officer  
CEO (Chief Executive Officer)

### Overview of the fiscal year ended March 31, 2019

#### A tough start in “DRIVE NTN100”

As the first year of the Medium-term Management Plan “DRIVE NTN100,” net sales for the fiscal year ended March 31, 2019 was 733.6 billion yen, down 1.5%, or 10.8 billion yen, from the previous fiscal year.

By business sector, sales for the industrial machinery applications and aftermarket applications were strong while sales for the automotive applications declined, primarily in China and Europe. In the wake of U.S.-China trade frictions, demand from China has sharply decreased since the second half of 2018. In Europe, demand has declined due to automakers’ delayed response to the new standard of fuel efficiency measurement for finished vehicles as well as U.S. sanctions against Iran.

Operating income was 26.9 billion yen, down 32.0%, or 12.7 billion yen, from the previous fiscal year. This was because of a decline in the amount of sales, a price hike of steel and supplementary materials, and increased expenses as a result of the additional tariffs imposed by the U.S. In addition, we recorded extraordinary losses of 19.3 billion yen including an impairment loss of 17.0 billion yen, resulting in a net loss

attributable to shareholders (parent company) of 7.0 billion yen and turning to red for the first time in five years.

The impairment mentioned above was for fixed assets such as equipment in manufacturing divisions in Japan. Behind this impairment, there are structural issues in our domestic production.

#### (1) Declining return on investment in domestic production

Currently, our products are produced in our domestic manufacturing bases as well as by manufacturing subsidiaries in Japan. In the past 10 years or so, the market in Japan has matured. Additionally, diversified manufacturing and other factors such as increased personnel expenses in manufacturing subsidiaries have negatively affected the situation, making it harder for us to manufacture efficiently. This is not the situation we initially expected.

#### (2) Increased expenses in the head office in Japan

Amid the sluggish growth in the domestic market, NTN has focused on expanding businesses in overseas markets, which has been strongly led by a solid support by the head office, including R&D, production engineering, and quality control. Expenses that can be reasonably calculated are allocated to overseas subsidiaries, yet the cost burden on the head office is still increasing. Under these circumstances, we have made a profit by cutting costs, but rapidly increased costs, primarily a steep rise in prices of steel and supplementary materials, have made it harder for us to turn a profit. From here on, we

will accelerate structural reforms in manufacturing divisions in Japan and immediately carry on to improve our business structure to generate profit.

Although we had to face severe results in the fiscal year ended March 31, 2019, operating income and ordinary income resulted in profits. Based on our stable dividend policy for medium-term distribution, we paid interim and year-end dividends of 7.5 yen per share each, for a total of 15 yen per share in annual dividends. We expect the turnaround of net income attributable to shareholders (parent company) in the fiscal year ending March 31, 2020 by expanding sales in the aftermarket applications and reducing external procurement costs. Accordingly, we plan to maintain the same annual dividend payout as the previous year at 15 yen per share.

### Main initiatives for the second year

Under “DRIVE NTN100,” we are working to bring sustainable growth of our business ahead and strengthen management bases that support the growth. We will work on variable cost reformation, structural reforms of man-hours and resources, enhanced supply chain management, and concentrated investment.

In addition, during the second year of the Medium-term Management Plan, we will focus on the following three reforms:

#### (1) Break away from self-sufficiency

So far, we have adopted integrated production, conducting everything from pre-manufacturing process, such as forging and turning, to assembly. From now on, we will expand outsourcing of pre-manufacturing processes. Also, for finished products, we will accelerate outsourcing for general-purpose products to OEM supplies.

#### (2) Variable cost reformation

We will promote significant cost reduction by strengthening cooperation with major suppliers and focusing on fewer suppliers. In addition, we will expand procurement from the most appropriate regions based primarily on local procurement to reduce risk involved in exchange-rates and tariffs.

#### (3) Restructure of business

In Japan, we will restructure the production of radial bearings, primarily based in the new Wakayama Works, in order to focus on high-performance products and high value-added products. In countries outside Japan, we will focus on investment in regions where we can expect significant growth in the future such as ASEAN countries and India. We will also expand OEM supplies by utilizing alliances.

We will soon build a solid business foundation that sustains global businesses by implementing these structural reforms.

## Management Commitment

### Practicing "transformation"

#### A sign of "transformation"

"DRIVE NTN100" manifests our determination of accelerating "transformation," which was introduced in the previous Medium-term Management Plan "NTN 100." A transformation never ends even after its completion, as the next transformation is waiting to begin. In this regard, you may think why we would use the word "transformation," but I believe that businesses should always undergo creative transformations and continue to change.

The last year's NTN Report presented frank opinions expressed in the "Outside Director Dialog." Some comments were quite tough and we anticipated that disclosing such contents would elicit various responses, but we also believed that presenting the dialog openly would contribute to transparency of our business. We received positive recognitions from inside and outside the company, especially from investors.

I have repeatedly expressed the necessity of transformation in the company. As I wanted to set up a meeting where our employees would express their frank opinions about their actual perspectives, I created an opportunity to have a dialog with our employees for the first time. (See pages 25–26 for more details)

#### Changing our mindset to think globally

During the "Outside Director Dialog" mentioned earlier, a problem was pointed out that our head office lacked the mindset that our business is developed "globally." NTN has expanded its business operations worldwide with overseas sales accounting for 70% of consolidated sales. As indicated by our Outside Directors, I am aware of our task to instill self-



Dialog with employees

awareness that each division in the head office should take responsibilities globally.

Yet, we do have seen signs of gradual changes. For example, we have seen changes in the past few years that our procurement divisions began obtaining quotations from overseas suppliers as well. In addition to conventional ways of procurement by region, we are working to centralize the purchase globally, thereby expanding the benefit of scale. In order to further accelerate this move, in January this year, we have appointed Herve Brelaud from NTN-SNR ROULEMENTS, a subsidiary in Europe, as the head of procurement divisions at the head office.

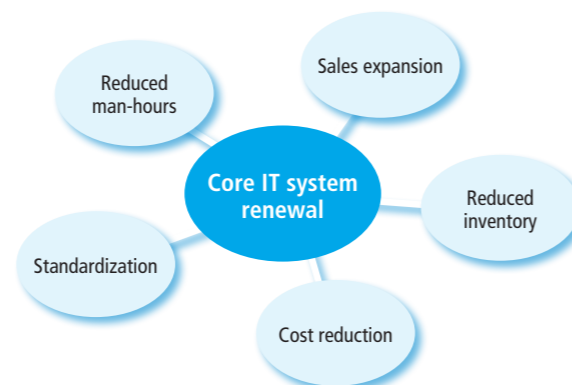
(See page 64 for more details)

#### Strengthening profitability

We are also working on measures to strengthen profitability over the medium to long term.

Our core IT system has not made a major upgrade for decades. We intend to introduce the latest system, which will help centralize information on demand and production, achieve efficient inventory holdings, and reduce lead time and man-hours.

#### Enhancing supply chain management through core IT system renewal



The new Wakayama Works promote a smart factory through the effective use of IoT, AI, and robots. The automated manufacturing process will contribute to labor saving as well as reduction of lead time and manufacturing costs.

In anticipation of shrinking working-age population in Japan, RPA (Robotic Process Automation) has been adopted in indirect divisions to automate and replace humans for some tasks. In technical divisions, RPA has produced positive results as the time required for drawing, for example, has been reduced from 30 minutes to 7 minutes per project. We are going to replace humans with RPA for all routine operations and take on new businesses without adding staff.



#### Establishing the CAE R&D Center

With the rapid development of information and communications technology and intensifying global competition, industrial R&D is required faster speed than ever. Under such circumstances, NTN is enhancing industry-academia collaborations and conducting R&D with the latest technology.

In October 2018, the CAE R&D Center was newly established to further accelerate our R&D activities. CAE (Computer Aided Engineering) is a technology using computer software to help analyze design and structure of products as well as simulating the various types of experiments. This technology allows us to obtain necessary results in a short period of time, leading to more efficient R&D and accelerating the development speed. The CAE R&D Center is responsible for the field of CAE in the NTN Group, including automotive, industrial machinery, and new areas. In the industry-academia collaboration, we established the "NTN Next Generation Research Alliance Laboratory" in the Graduate School of Engineering at the National University Corporation Osaka University. By incorporating its cutting-edge technology, we will pursue NTN's proprietary CAE technology. We will make highly reliable technical proposals based on logical data in a timely manner to help our customers in accelerating their development speed.

### For providing new values

#### Developing into new areas using our core technologies

The automotive industry is undergoing major changes called "CASE\*." NTN's core products, hub bearings and drivshafts, are essential products used in vehicle axles and drivetrains. These products are increasingly adopted by EV makers, and we expect further sales expansion in the future.

\* CASE is an acronym of Connected, Autonomous, Shared/Service, and Electric.

In addition, we are accelerating the development of new products for electrification. We will work to meet new needs by providing our new products, including "sHUB," "eHUB," and "Electric Motor and Actuator." "sHUB" is a hub bearing with steering assist function; "eHUB" is a hub bearing with motor generator function; and "electric motor and actuator" works with electric pumps and brakes.

In the industrial machinery applications, the demand for robot-related products will increase to save labor. NTN developed a module product for robots, "i-WRIST™," and has started mass production for appearance inspection. This

## Management Commitment



product allows high-speed positioning with human wrist-like movements, making the automation of work possible that has been done by human hands.

As for wind turbines, there has been a growing need for monitoring wind turbines to detect malfunctions as they cause a power supply disturbance when the system fails and stops generating power. Our Condition Monitoring System (CMS) for wind turbines will detect malfunctions at an early stage through remote operation, which helps to prevent major failures from happening and maintains stable operation. The CMS technology is a promising area for further expansion as it can be applied in various fields such as rolling stock and machine tools.

In the industry-academia collaboration, we are conducting research with the National University Corporation Osaka University to evolve the ability to predict residual life of bearings using AI.

We aim to achieve this as soon as possible because, if this happens, we can monitor any kind of bearings used in automotive parts and industrial machinery, resulting in significant contribution to safety and security.

## Contribution to preventing and minimizing disasters with natural energy products

We not only help reduce an energy loss through our core technologies, but we are also working on developing products that use natural energy. We work toward the "local production for local consumption" energy cycle where energy is generated and consumed locally which contribute to achieving a low carbon society.

The "NTN Micro Hydro Turbine" can generate power with high efficiency by just placing it in an existing water channel such as an agricultural water channel, and in 2018, NTN received an Award for Excellence in the "28th Nikkei Global Environmental Technology Awards." This innovative product can produce significant energy from water channels that have not been made effective use, which we are committed to promote as a part of our contribution to realize a sustainable society.

"NTN Green Power Station (formerly known as NTN Hybrid Street Light)" is an independent power supply that does not require electrical installation works. The battery is charged from the power generated from wind and sunlight, which can be used for automatic LED lighting at night.

In the wake of frequent and large-scale natural disasters in recent years, one of the social issues is establishing a system to secure electricity in case of emergency. To resolve this social issue, we have newly developed "N<sup>3</sup> N-CUBE," Container Type Transportable Independent Power Supply. Equipped with power generators and storage batteries, it generates electricity from three types of natural energy: wind, water, and solar power. This power supply can be installed quickly by a small group of people in the event of disaster, and no refueling is required in case of emergency.

Through natural energy products using our core technologies, we are also contributing to the achievement of SDGs (Sustainable Development Goals) related to energy and environment.

Container type transportable independent power supply "N<sup>3</sup> N-CUBE"



Example of assembled products application (fully equipped with a wind turbine, hydro turbine, solar panels, and storage batteries)

## Toward realization of "NAMERAKA\* society"

\*"NAMERAKA" means "smooth" in Japanese

## NTN SPIRIT, the cornerstone for our employees

Our Founder's Spirit is made up of the "Frontier Spirit" and "Coexistence and co-prosperity Spirit." That spirit is included in our corporate philosophy: "We shall contribute to international society through creating new technologies and developing new products" and it has been passed down through the company for 100 years. In conducting business activities based on our corporate philosophy, the "NTN SPIRIT" clearly states the awareness and behavior that employees should aim for.

In November 2018, we published the "NTN SPIRIT BOOK" and distributed it to NTN Group employees in order for them to recognize the "NTN SPIRIT." In order to deepen empathy and understanding of the "NTN SPIRIT," we also hold "Corporate Philosophy Dialogs" to share experiences and exchange opinions. Members of overseas upper management who participated in the dialogs gave very positive opinions such as: "We cannot have employees apply the 'NTN SPIRIT' to their tasks and think independently by simply distributing cards, posters, etc." and "On-site seminars are must, no matter how long they take to put together." The "NTN PROUD AWARD," which evaluates activities based on our corporate philosophy, will be awarded for the second time this year and it encourages employees to practice this corporate philosophy.

(See pages 57–58 for more details)



NTN SPIRIT BOOK

Through these activities, we strive to become "a company where its corporate philosophy is understood by all employees and where all employees think and ask for themselves," which is one of the long-term visions of "Our Vision."

NTN has made a transition from a Company with Board of Company Auditors to a Company with Nominating Committee, etc. The purpose of this transition is to establish a prompt decision-making structure and operational execution organization, strengthen the supervision of management, and improve management transparency and fairness. (See pages 45–46 for more details)

## ESG initiatives

We will contribute to the realization of a sustainable society by addressing ESG issues through practicing our corporate philosophy. In 2015, we endorsed the United Nations Global Compact and support ten principles in four areas: human rights, labour, the environment, and corruption prevention. We also carry out business activities with an awareness of the SDGs.

Our eco-products including bearings reduce energy loss in various industries, and we are working to solve social issues by creating energy through products that utilize natural energy. We also hold the "NTN Rotating School" both in Japan and overseas, a hands-on experience that allows participants to enjoy learning about saving energy technologies and environmental issues to focus on education for the next generation that will play a key role in sustainable societies.

At the end of December last year, we held the first "ESG Meeting" to explain these activities to institutional investors. By having dialogs, we have become aware of the ESG issues we face and will utilize their opinions to strengthen our activities toward realization of the future.



The first ESG Meeting

## Contribution to developing a sustainable society

We came out with the communication phrase "Make the World NAMERAKA. NTN" to help welcome the company's 100th anniversary. As society faces unprecedented environmental changes, we intend to contribute to the development of a sustainable society with our technologies and services.

We will continue to transform ourselves toward the "realization of NAMERAKA society." We sincerely appreciate your continued patronage and support.

# Sharing Thoughts on the Corporate Philosophy and "Transformation" Dialog between the president and employees

Last year, NTN Corporation celebrated its 100th anniversary. Taking this opportunity, we reviewed our corporate philosophy system and newly established the "NTN SPIRIT." Since the previous fiscal year's Medium-term Management Plan "NTN100" (April 2015 to March 2018), we have established measures to restructure our business structure, centering around the key concept of "transformation." In the current Medium-term Management Plan "DRIVE NTN100" (April 2018 to March 2021), we have implemented a range of measures to accelerate this effort.

It has been about two years since we started spreading awareness of our corporate philosophy. This time, we set up the first meeting between President Ohkubo and employees who closely interact with stakeholders. The President and these employees openly exchanged their thoughts and opinions on how much our corporate philosophy has been adopted among employees and how "transformation" has been understood.



**Participants** \* The relevant stakeholders each participant closely interacts are shown in brackets.

- President Ohkubo**
- Kouhei Iguchi** Corporate Value Promotion Department Manager; Facilitator
- Y. O.** Osaka Sales Office [customers]
- M. K.** Corporate Value Promotion Department [local communities]

- N. T.** Global Human Resource Development Department [employees]
- A. O.** EHS (Environment, Health and Safety) Integrated Management Department [environment]
- Y. K.** Procurement Planning Department [business partners]
- T. H.** Corporate Communications Department [shareholders]

## TOPIC 1

**We have taken on challenges for "transformation" over the past several years. Do we feel that NTN has transformed since joining the Company or compared to 10 years ago?**

**Y.O.** The image of NTN has been "hard" in a positive way. In recent years, however, I have more comments from other employees and stakeholders that "the company has changed." I think our TV commercial (launched two years ago) has also been a large influence. The sound of the phrase "NanTe Nameraka" ("How smooth" in English) gives some customers an impression of NTN being soft and flexible.

**M.K.** I have worked here since I graduated from school, and it is this very place at this very moment that I feel the "transformation." Previously, there was an atmosphere of a top-down approach, but now I feel that this meeting opportunity is the first step for transformation.

**N.T.** I do not feel major changes over the past 10 years. However, since the term "transformation" was introduced in the Medium-term Management Plan in the past few years, it appears that people around me have developed an awareness of the "need for change." On the other hand, even though the concept of "transformation" is there, our environment has not been prepared enough for accepting it. I think we need to raise an awareness and create a culture where employees can accept a transformation.

**A.O.** I was transferred to the head office last year after working as an on-site technical support staff as well as in research and technology development. In the workplace, even though employees are aware of the NTN SPIRIT, it has not been put into practice. In addition, while each individual works hard, I feel they are not active in cross-divisional interactions. I currently belong to the environment division, and there are many things that cannot be accomplished by our division alone. Yet, everyone has already set his or her scope of work, making it difficult to cross boundaries.

**Y.K.** I belong to the procurement division. A major change for us is that we have more interactions with overseas divisions in recent years. However, although the head office functions as Japanese headquarters, it has not been functioning enough as global headquarters. Currently, each region has an authority to conduct its own procurement. In order to unite as a procurement division by promoting mutual understanding and exchanging information with

overseas subsidiaries, and become truly global headquarters, we need further transformation.

**T.H.** Compared to when I joined the Company in 2015 (when the previous Medium-term Management Plan was established), I feel that operations are required to be reexamined more intensely. This has contributed to saving on man-hours. Although we have the intention to change the Company as a whole, it appears that we have not yet determined how to change it.

**President Ohkubo** I think it would be hard for a company to be transformed in just a few years after having been in business for 100 years. However, something to trigger us is necessary. Even if we make a change on the surface, it would be meaningless unless we change essentially. If we are the only ones who think that we made a change, that is a mere self-satisfaction. The change needs to be noticeable to outsiders. It may not be easy to change after 100 years of establishment, but I keep talking about this because we won't change unless we voice it. As it has been only three or four years since we laid out the "transformation" plan, I did expect that many of you have not felt its effect.

## TOPIC 2

**We have promised our stakeholders to achieve a "smooth society." How should we work toward this?**

**Y.O.** For our customers, our first priority is to follow our corporate philosophy that "We shall contribute to international society through creating new technologies and developing new products." Specifically, we must know market needs, identify potentials, and act by adding something uniquely NTN there. However, we still have challenges in the action part. We have guidelines for each business unit, but it is difficult to visualize specific actions.

**M.K.** It is important to get closely involved in our local community through regional development and social contribution activities. From the standpoint of fostering the next-generation, we have held NTN Rotating School, where children can learn about bearings, the environment, and energy-saving technologies. I believe that a "smooth society" will be achieved by building relationships that enable local communities and NTN to grow together.

**N.T.** In terms of human resource development, it is important to create a communicable workplace. The opposite of "smooth" is "rough." We do not want a workplace where employees' minds are roughed up. While benefits and vacation are essential, it is important to maintain a workplace where employees can communicate freely and pursue a self-actualization. I hope the company will be a place where we can create something good even out of disagreements.

**A.O.** The environment, I think, is an issue we must actively get involved in by recognizing that it is something we should take initiatives. For example, sales representatives who get in contact with customers know the best what kind of environmental information the customers are looking for. So, our environment division and sales representatives need to work together in response. In the midst of tightening environmental regulations, if an environmentally hazardous substance is found in one product, customers consider

that all products may be in violation of environmental regulations. Therefore, we need to promote environmental education to increase the understanding of laws and regulations.

**Y.K.** When I meet our business partners, I am often told that "there are many sincere people at NTN." I think this is the result of earnest and hard work by our predecessors and factory workers. I believe that a "smooth society" can be achieved by creating our fans and working together to provide steady supply, reduce costs, and maintain high quality through procurement processes.

**T.H.** When providing information to our shareholders, analysts, and newspaper reporters, we need to get more NTN fans. I think it is not easy for the general public to understand what "smooth society" is. We can think of examples such as a society where machines work smoothly, to build a recycling-based society with natural energy products, or to make even people's mind smooth through our bearings. Perhaps, specific goals may help people to understand a "smooth society."

**President Ohkubo** The definition of "smooth" is more than one. It is important that each of us think what "smooth" means. The NTN founders' spirit consists of "frontier spirit" and "coexistence and co-prosperity spirit." Adopting something new leads us to "frontier spirit." There is no end to transformation. As soon as we see a change, the next transformation begins. There is no way to change without adopting something new.

In addition, while NTN is a for-profit organization, our business is ultimately about contributing to society. This is the "coexistence and co-prosperity spirit." I hope not only NTN but also every company to contribute to society. We provide opportunities to learn about bearings through "NTN Rotating School." I would be happy if people develop an interest and join our company, but it is also okay if they succeed in other companies. Through bearings, we help people to develop an interest in environment, too. If we can open up such opportunity, that is also a way to contribute to society.

## TOPIC 3

**What should we do to make NTN a better company?**

**M.K.** Until today, I thought that "transformation" was something hard and big and the term was intimidating by itself. However, today's conversation made me realize that we can start with a small project, that something new is something fun, and that is where the root of "transformation" lies. As NTN continues to globalize, raising awareness of our corporate philosophy and founders' spirit are becoming more important. I feel that we need opportunities to share the President's message with many of the employees.

**Y.O.** I think that the NTN SPIRIT serves good as a guideline or decision-making criteria for employees. I believe the capabilities of NTN will grow greater and stronger if we can expand it globally. In cases of other companies, where their own "way" is spread through, the management capability is strong. It is very important to make the NTN SPIRIT spread through.

**A.O.** The reduction of CO2 and prevention of global warming are major challenges that everyone is facing today. It is important

that each employee have a sense of ownership toward the issue. For example, I would like to properly evaluate and disclose the environmental friendliness of our products. Then, using this as a benchmark, each department throughout the Company can work to improve the environmental performance of our products.

**T.H.** As I publish internal publications, I feel that it is important to share the President's message. In today's meeting, we have learned many ways to interpret "smooth." Now, President Ohkubo, how do you describe your "smooth"?

**President Ohkubo** I use the term in various contexts. There is no absolute definition of "smooth." I think each person can pursue an ideal "smooth" that fits in his or her position. However, I would like to cherish the term "smooth" as it sounds pleasing to the ear.

**Y.K.** Smooth communication is another example. There are people we have never met among our overseas suppliers. I am realizing the importance of communicating our procurement policies by talking to them face to face.

**N.T.** Human resource development is carried out not only by the human resource development division at the head office, but also at each workplace through personnel training. We intend to share information and exchange opinions with domestic and overseas bases more than ever, and come up with better measures for human resource development. In addition, I think it will become more important how managers interact with their staff. What kind of skills do you think managers should have?

**President Ohkubo** Personnel training certainly varies depending on the culture and custom of each country. However, even with different nationalities, we can surely understand each other as the same humankind. While we respect different aspects such as recruiting systems and school educations, we can think globally on common grounds. Managers do not have to think as big as educating people. Rather, they just need to pass on their knowledge to their staff.

When a new task comes in, the first thing they have to do is to fully understand it for themselves before passing it down to the staff. If the staff produced a good result, then give them a good feedback. I think positive feedbacks should be actively communicated, although mistakes can also be reminded. I hope our Company embraces such a culture.

**Iguchi** Thank you, everyone. In today's dialog, we had a frank conversation with President Ohkubo about "transformation" as well as how our corporate philosophy has been adopted in the workplace. The "adaption" does not have a specific form or answer but rests in the mind of each of us. As President Ohkubo mentioned, "transformation" is not something to be initiated by a company. It is important to understand that each employee who works there must have a mindset to initiate changes. After talking directly with the President today, I believe everyone here has developed a sense of empathy and become motivated to put it into practice. This was the first dialog between the president and employees, and I feel that it was a great opportunity for us to raise awareness. By continuously holding such dialog, I believe we can create a virtuous circle of awareness-raising for "transformation." I hope we spread such awareness throughout the NTN Group and contribute to achieving a "smooth society" that our company is aiming for.



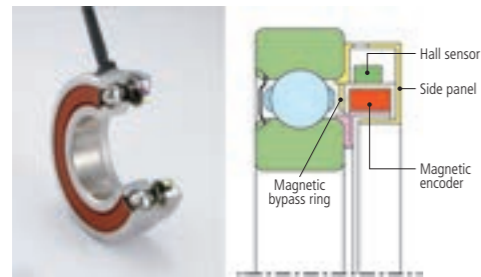
# NTN Technologies for Realizing NAMERAKA Society Gaining competitive advantage by providing high-precision technical data services using failure detection technology

In recent years, IoT built on Industry 4.0 and Society 5.0 is rapidly gaining its popularity. Collecting data from various devices and analyzing it as big data are not only helping to improve the productivity in manufacturing businesses and prevent loss of opportunities through appropriate maintenance but also increasingly being utilized in various fields including the improvement of quality of life. NTN has been developing condition monitoring systems (CMS) based on the diagnostic technology for bearings we have accumulated over the years. Here, we introduce our technologies, which are expected to grow as the adoption of IoT accelerates in the future.

## Failure detection technology for rolling bearings

In the early 1990s, NTN developed a rolling bearings unit with a built-in rotation sensor and introduced the product to the industrial machinery market. Rolling bearings are the parts built into a wide range of machinery applications such as automobile, rolling stock, construction machinery, and machine tools, to support various rotational movements. In large machinery applications where high reliability and safety are required, such as power generation facilities and rolling stock, monitoring is necessary during operation, including peripheral components.

We developed the Integrated Rotation Sensor Bearing and the Bearing with High-Resolution Rotary Sensor. In addition, we have been developing products with a sensor built into bearings or its housing in order to detect vibrations, rotational speed, temperature, etc. of rotating shafts. These products make a preventive safety function possible which alerts an early sign of failure by identifying the source of vibrations from the detected rotational speed and vibration frequency, and detecting signs of a vibration increase.



Integrated Rotation Sensor Bearing



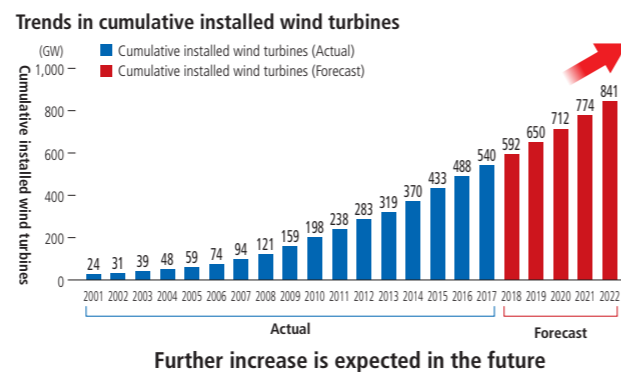
Bearing with High-Resolution Rotary Sensor for automotive driving support systems

## CMS (Condition Monitoring System) to solve the problem of wind turbine business operators

In order to advance the failure detection technology, we have been involved in the NEDO\* project with the University of Tokyo, National Institute of Advanced Industrial Science and Technology, etc., and worked to detect failure signs in large wind turbines.

Wind turbines have been introduced on a global scale, and the number is expected to increase further in the future. On the other hand, wind turbine business operators are facing an issue in performing maintenance efficiently. In order to cut the costs of generating electricity, it is necessary to reduce the initial capital investment, implement a high-efficiency power generation system, and increase the capacity factor. In other words, once the operation begins, it is essential to maintain stable operation, and the system downtime must be kept to the minimum. In order to reduce downtime even by a small amount, periodic inspection and preventive maintenance of the system are important measures. However, since wind turbines are always built in the areas of strong wind conditions, the conventional ways of checking and emergency response by human not only had a problem with the accessibility in terms of the location, but also required significant time to determine the cause of the problem and identify the area of failure. In addition, a delay in detecting signs of failure in bearings and gears had a risk of a partial failure spreading to the entire system. As a result, repairs and replacements caused unexpected downtime, leading to a major problem of lost opportunities.

\* NEDO: New Energy and Industrial Technology Development Organization



Source: GWEC GLOBAL WIND STATISTICS 2017

### Business operators' needs

#### Reduce downtime

- 1) Conduct scheduled maintenance mainly in the summer when the wind conditions are unstable
- 2) Give priority to generating and selling electricity during early fall through early spring when the wind conditions are stable
- 3) Detect signs of failure in advance and arrange early part replacements
- 4) Prevent secondary damages beyond the damaged area
- 5) Reduce lost profits and maintenance costs

Introduction of CMS can bring great benefits by detecting signs of failure and identifying the area of failure



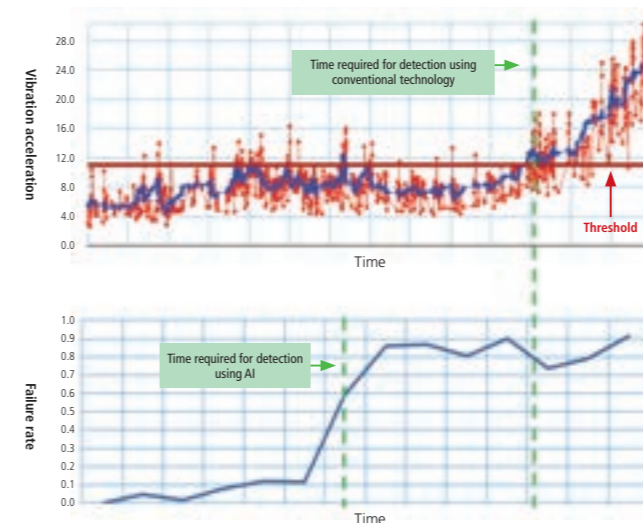
Taking everything into account, NTN introduced the Condition Monitoring System (CMS, under the brand name "Wind Doctor™") for wind turbines to the market in 2012, which monitors the conditions of wind turbines applying vibration analysis and sensing technologies. The system collects data remotely using various measurement sensors installed, such as a vibration, displacement, and temperature sensor. Using these data, it detects early signs of failure, which helps to reduce the maintenance burden by preventing damage from spreading, making it possible to prepare and treat problems properly by identifying the area of failure.

It already has a proven track record as one of the services for providing data on the operational status using IoT. As of November 2018, the number of installations of this system in Japan has reached nearly 200 units, accounting for the largest share in the Japanese market.

## New development of failure detection technology

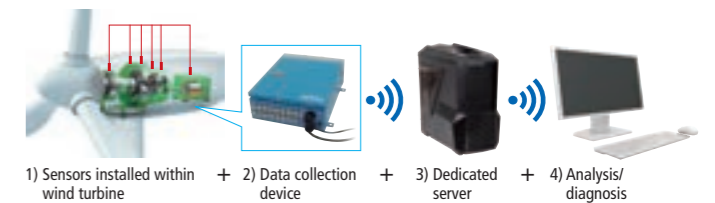
The primary purpose of the failure detection technology is not only an early detection of damages but also a prediction of residual life of parts. In other words, it is important to minimize the downtime due to failures, and it is also desirable to know how long the unit can be operational so that replacement parts can be prepared ahead of time. However, how the actual damage occurs after the detection of signs of failure would vary greatly depending on the operating conditions and environment. Therefore, there are still issues in realizing the residual life prediction.

Not just limited to wind turbines, there are many other applications where damage to bearings can cause a societal loss. In



Example of early detection of signs of failure using AI

## System configuration of "Wind Doctor™"



### Features of CMS (Condition Monitoring System)

- 1) About 10 sensors are installed in the bearings for main shaft, gearbox, and generator
- 2) The data collection device measures each sensor signal every two hours
- 3) The data is transmitted to and stored in a dedicated server via an internet connection
- 4) The data sets are analyzed and diagnosed normal or abnormal

In addition to vibration data and other data mentioned, new analytical methods and precision diagnostic technologies, which use other sensing data such as sound and vision, will become increasingly necessary in the future. We use AI technologies in our failure detection technology to provide high-precision and useful technical information services. At the same time, we will work toward further development including the application of this technology to not only wind turbines but also the improvement of operation rates and reduction of maintenance burdens of rolling stock and other industrial machinery, etc.



Future plan of CMS

# Research & Development

## R&D initiatives

Fully utilizing our engineering expertise such as tribology, heat treatment, precision processing, precision measurement, and CAE to develop high-performance, energy saving, lightweight and compact products, we are committed to provide products suitable to a low carbon society and improve customer satisfaction, as well as contribute to not only the sustainable growth of our company but also a sustainable society.

The automotive industry has entered an era of once-in-a-century transformation represented by CASE (Connected, Autonomous, Shared/Service, and Electric). In anticipation of the market trends, we conduct our R&D focusing on technologies necessary for C (Connected), A (Autonomous), and E (Electric) of CASE.

Regarding the development of bearing, we are continually pursuing technological innovations such as low friction, high speed rotation, and high load capacity by strengthening core technology and incorporating cutting-edge technology. Recently, we received awards for excellent technology in "CHO" MONODZUKURI Innovative Parts and Components Award with the "Low Torque Seal Ring" in 2016, the "ULTAGE Tapered Roller Bearing for Automotive Application" in 2017, and the "Ultra-low Friction Sealed Ball Bearing" in 2018 sponsored by MONODZUKURI Nippon. Conference and Nikkan Kogyo Shimbun, Ltd.

We are also developing and proposing module products with sensors and control systems (Electric Motor and Actuator) and system products (In-wheel Motor Systems) by utilizing technology collaboration with other companies. In addition, we have developed module products related to hub bearing which is one of our core product. One is "eHUB," hub bearing with motor generator function and the other is "SHUB," hub bearing with steering assist function. We have already started to propose the products globally to automotive manufacturers and conduct test-driving.

In the industrial machinery applications, R&D related to IoT, sensing, and robotics technologies has proceeded. The "Sensor Integrated Bearing Unit" for Machine Tool Spindles which perform the sensing around bearing raceway surface has enabled the advanced condition monitoring and the prevention of seizure of machine tool spindles. Since this product can send an alarm before the spindle is seized up, it prevents

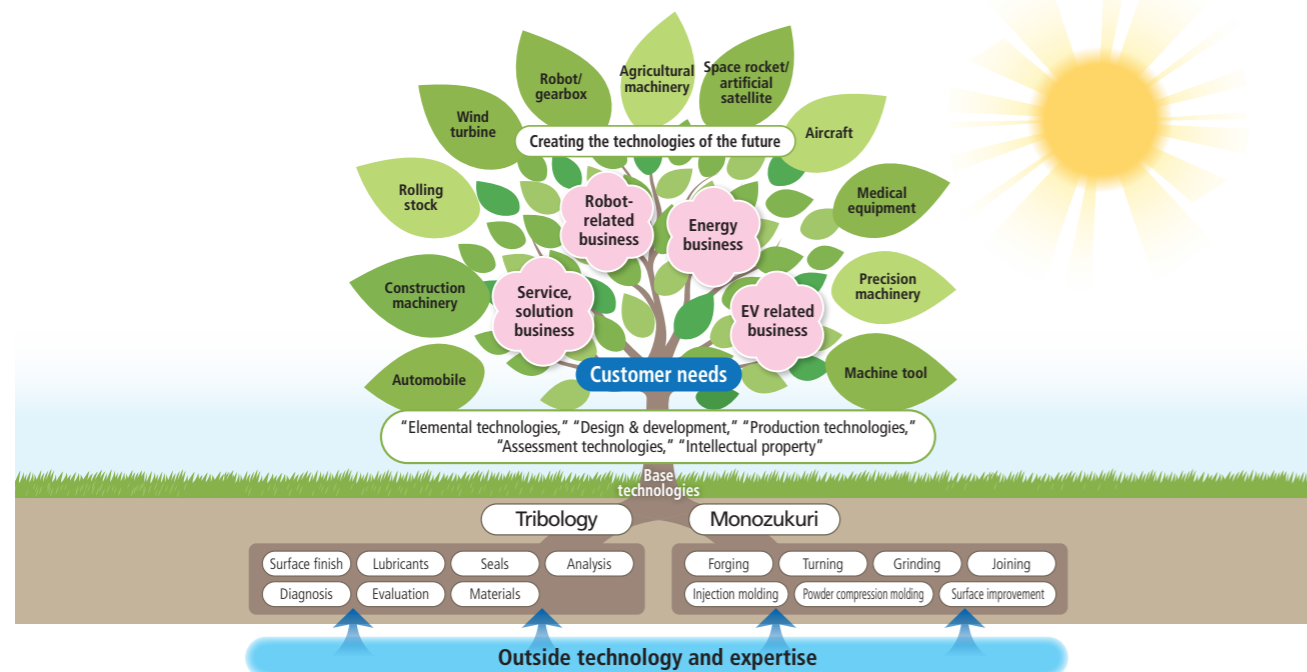
damage leading to a replacement of the spindle and improve productivity. In addition, we started mass-production of the "i-WRIST," a module product for the robotics applications that can move like a human wrist. With our proprietary mechanical link mechanism, the "i-WRIST" performs a wide range of motion while realizing compact design and space-saving. It can rapidly change angles like human wrist movements, making it possible to replace the work that has been done by human hands, solve a labor shortage, and meet the market demand of quality improvement.

As a business in new areas, we have developed natural energy products such as "NTN Green Power Station," an independent emergency power source for security and disaster prevention using natural energy, "Grid Connectable NTN Micro Hydro Turbine," which generates electricity by just being placed in a water channel and can transmit the electricity to commercial power lines, and "N<sup>3</sup> N-CUBE" which has improved "mobility" by storing these natural energy products in a freight container. In addition to responding to disaster prevention and mitigation, we are making proposal for locally produced and consumed renewable energy, which contribute to realizing a low carbon society.

We also conduct research on new technologies considering future business model changes and business expansion. We have already started failure detection monitoring service on bearings for large wind turbine. Expanding its field, we advance R&D on sensor technology to enable predicting the residual life of bearings, and program utilizing AI algorithms, leading to the expansion of the service, solution business.

Furthermore, we are working on R&D in the 3D cell layering technology with iPS-derived cells using our proprietary microscopic coating applications, aiming for use in drug design and regenerative medicine applications.

As initiatives to accelerate these R&D projects, we have established the "Patent Management Rule" as well as the "Patent Reward Rule" to reward our employees for their inventions. Foreign patents and know-how are also covered as inventions to be rewarded, and there is no upper limit on the reward payments. We continue to encourage our employees in their creative efforts at developing new inventions.



## Global R&D

We actively stimulate exchanges of technologies and human resources among R&D bases in Japan, Americas, Europe, China. We accelerate the creation of new technologies and products on a global perspective and established an R&D system that can accommodate the needs of global markets, by sharing information about design, prototypes, experiments, production technology, and customer projects via database.

In October 2018, we established the CAE R&D Center, aiming for higher efficiency and higher precision of our research and technological development activities. CAE (Computer Aided Engineering) technology is an engineering system that supports the design and development of industrial products by utilizing computer software, and that was previously conducted by the CAE Department. Establishing an independent R&D center for CAE will improve its reliability and precision, leading to reduce man-hours for design and experiments as well as to accelerate development speed.

In September 2017, the "NTN Next Generation Research Alliance Laboratory" was established in the Graduate School of Engineering at the National University Corporation, Osaka University. Using artificial intelligence (AI), it is working toward research that enables to predict the residual life of bearings, manage trends during a bearing operation, and prevent damage in advance, aiming to achieve cutting-edge technologies with business expansion in the next five to ten years in sight. While promoting stronger industry-academia collaboration, we will work to strengthen our core technologies by adopting the latest technology and conduct R&D toward creating new business areas.

In an effort to achieve the "Sustainable Development Goals (SDGs)," the common goals of international society, we will promote R&D which can solve social issues while keeping our roles in mind which we should accomplish as a company.

### Roles of R&D centers worldwide

Region	Center Name	Role
Japan	Advanced Technology R&D Center	In order to achieve the latest (world's best and first), the staff works on advancing tribology, materials, surface modification, and powder technologies to improve bearing functions and create innovative Monozukuri technologies that lead to global environment conservation. It also conducts R&D including the development of components and systems, aiming for growth markets such as in new energy resources.
	New Product Development R&D Center	With integrated talents and flexibility which are derived from mutual collaborations of engineers and their originality, the staff works on the development of new products for automobiles, industrial machinery, and aftermarket applications. It also develops systemized modules for existing products to create new value-added products, and establish core technologies associated with it.
Americas	Production Engineering R&D Center	The staff conducts R&D in production systems, production technologies, and production facilities with unprecedented unique technologies and core technologies that shall be inherited within the NTN Group. In addition, it provides solutions to the issues related to production technology from development to mass-production of new products as well as the guidance and assistance on production technology issues for the entire NTN Group.
	CAE R&D Center	The staff conducts research on advanced CAE technology with cutting-edge technology and develops proprietary CAE programs, aiming to advance and streamline the process of designing, developing, prototyping, and experimenting for the NTN Group's research and technology divisions by utilizing CAE technology.
	NTN Next Generation Research Alliance Laboratory	Aiming for business expansion in the next five to 10 years, the staff conducts R&D by adopting the latest technologies through industry-academia collaboration, aiming to strengthen core technologies and create business in new areas.
Americas	NTN Automotive Center (2 sites)	Industrial machinery: The staff provides technical proposals as well as technical support based on customer requirements such as evaluation tests and application development. Automotive: The staff also conducts evaluation tests, research and analysis for products after use, technical support based on customer requirements, technical proposals, and development for local procurement.
Europe	NTN-SNR R&D Center	SNR ROULEMENTS joined the NTN Group in 2008 and became NTN-SNR ROULEMENTS. Utilizing the expertise gained through its 100-year history, the staff works on the development of new products and new technologies.
China	NTN China Technical Center	The staff provides sales engineering which contribute to solving customer problems, various evaluation tests, and research and analysis of products after use. It also conducts evaluation and analysis of local materials in China, aiming to increase the rate of local procurement.

### A message from CTO (Chief Technology Officer)

In recent years, we are further required to improve our work efficiency as initiated by the work style reforms, making it difficult for us to conduct R&D using as many man-hours as before. In addition, due to the effect of the declining birthrate and aging population in Japan, we expect that the staff involved in R&D will decline in the future. Under these circumstances, we established the CAE R&D Center in October 2018 to conduct R&D activities producing high-added value with fewer staff as well as increased efficiency and precision.

In this R&D Center, we conduct R&D for the advancement of CAE (Computer Aided Engineering) technology, an engineering system to help design and develop industrial products by utilizing computer software. The CAE technology simulates the various experiments and tests that are necessary during R&D activities, and the results can be confirmed in a short time. This can reduce R&D man-hours required conventionally and allow researchers to focus on higher value-added R&D activities. In addition, the technology can reduce the time required for development, resulting in a shorter R&D cycle for new products as well as an early injection of competitive products to the market.

With further advanced CAE technology, we will achieve reduction of man-hours required for design and experiments to accelerate development and promote the creation of competitive technology.



Representative Executive Officer, Senior Managing Executive Officer  
CTO (Chief Technology Officer)  
**Yoshinori Terasaka**





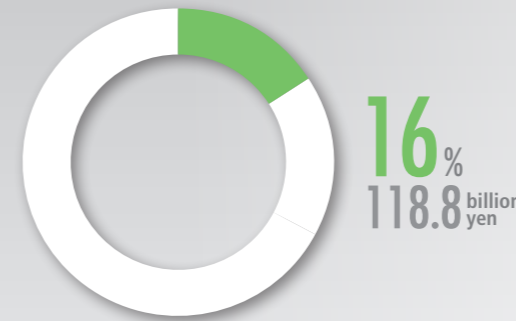
NTN provides various products for industrial machinery and automotive maintenance needs. For the industrial aftermarket, we provide bearings for general machinery and equipment used in industries such as mining, paper, and steel. For the automotive aftermarket, we satisfy customer needs with a product lineup of repair parts (auto parts) composed of bearings and peripheral components. We also provide after-sales services, such as holding engineering seminars with technical service units, to help our customers improve their production efficiency and ensure their stable operation.



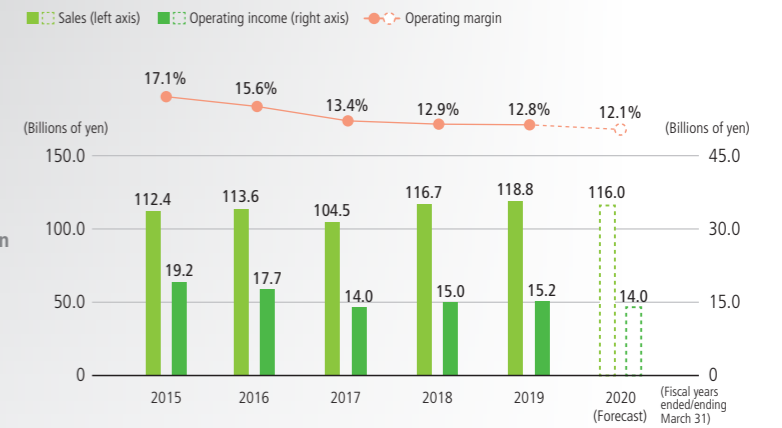
Managing Executive Officer  
**Eiiichi Ukai**

# Aftermarket

Percentage of total sales



Trend in business performance



## Business environment

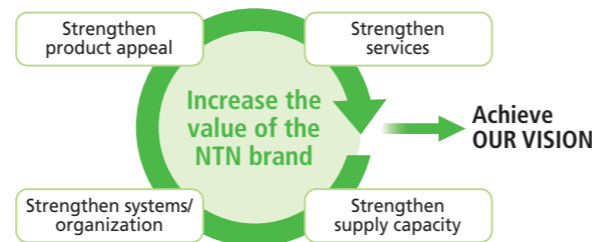
One of the issues in our aftermarket business is that the level of the brand recognition in some overseas regions is not as high as it is in Japan. In addition, we have actually not been able to secure an advantage over our competitors, who penetrate the aftermarket with a full suite of products and services including not only bearings but also peripheral components and after-sales services.

The challenge for us is to gain larger purchase share of our products from overseas distributors, which carry multiple brands, while on the other hand, Japanese distributors carry our products exclusively. To that end, we need not only to strengthen our services and improve the quality of our products, but also recognize that we need to strive to improve the overall quality and increase the value of the NTN brand, through efforts such as improving the quality of packaging boxes and reinforcing measures against counterfeit bearings. In order to increase the market share of our products carried by overseas distributors, it is also an important factor to develop an immediate delivery system mainly for top-selling products. In the fiscal year ended March 31, 2019, amid a tightened supply-demand situation, we could not increase our production to catch up with the demand, leading to loss of sales opportunity. We are also working to strengthen our supply system by minimizing the gap between demand forecasts and production arrangements and increasing the production for aftermarket.

In addition, increasing influx of low-priced products produced in emerging countries is one of the threats. We

are promoting strategies to secure advantages, such as identifying the needs of each market and using different brands appropriately.

Changes in market environment	NTN's strengths
<ul style="list-style-type: none"> <li>Presence of competitors in the overseas aftermarket</li> <li>Expansion of needs for service, solution business and increase of role that customers expect from suppliers</li> <li>Intensifying competition due to the commoditization of bearings, primarily of general-purpose products, and the influx of low-priced products</li> <li>Proliferation of counterfeit bearings</li> </ul>	<ul style="list-style-type: none"> <li>Networks of major domestic and overseas distributors, and strong partnership with major distributors</li> <li>Broad product lineups</li> <li>Experience and know-how in supplying products for MRO in the global market</li> </ul> <p><small>*MRO: Maintenance, Repair and Overhaul</small></p>



## OUR VISION

**Transform from a "Manufacturing Company" into a "Company that Delivers Value to Customers through Products and Services."**

The business environment such as the rapid development of AI, IoT, and other digital technologies, environmental issues, and demographic shifts has been changing continually and companies are required to be flexible in accommodating new market needs to ensure sustained growth. In the aftermarket business, suppliers are faced with new expectations in addition to usual requirements, including high-quality products, broad product lineups and prompt delivery. The role of suppliers, particularly those in the equipment aftermarket such as steel and paper industries, is gradually changing from a bearing supplier into a provider of comprehensive maintenance services

for equipment and peripheral components. We have also started whatever possible to enhance our service business, such as conducting needs surveys at distributors and end users and making proposals of repair services for bearings for paper-making machinery. In addition to these continual efforts, through proposing a new business model, which provides not only bearings but also services, including the monitoring of bearing operations and services based on prediction of the bearing life by utilizing our expertise in sensing and digital technologies such as AI and IoT, we aim to further enhance our brand value and win the best customer satisfaction in the aftermarket.

## Results for the fiscal year ended March 31, 2019

Demand in the industrial aftermarket increased in all regions. Demand in the automotive aftermarket increased in the Americas and other regions, but remained unchanged globally. Amid a tightened supply-demand situation, we increased our production to the best of our capacity, but we could not restock inventory for immediate delivery in time, leading to some loss of sales opportunity due to supply shortage. However, sales were 118.8 billion yen, up 1.8% from the previous year, due to positive sales activities and reinforcing technical services. We were affected by rising raw material prices and manufacturing costs, but due to efforts to increase selling prices, operating income was 15.2 billion yen, up 1.2% from the previous year.

## Forecast for the fiscal year ending March 31, 2020

In order to ensure a stable supply of products to the aftermarket, we are expanding the use of products manufactured in Italy, Germany, Canada, Taiwan, and other countries. At the same time, we are promoting the inventory improvement of top-selling products. On the other hand, we expect demand to decline in some regions and in some industries. We expect to result in sales of 116.0 billion yen, down -2.4% from previous year. We also expect to result in operating income of 14.0 billion yen, down -7.9% from previous year, due to the impact of the decline in volume, despite ongoing efforts to raise prices, expand its product lineup, strengthen services and its organizational structure.

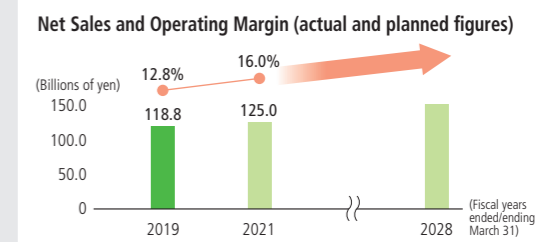
## DRIVE NTN100 strategies and progress

### Strengthen sales and technical service network

In Japan, in April 2018, in an effort to reinforce the sales and technical service network for the aftermarket business, we integrated the domestic branch of Aftermarket Business Headquarters with the operations of NTN Bearing Service Co., Ltd., a consolidated subsidiary, and changed the name from NTN Bearing Service Co., Ltd. to NTN Sales Japan Corporation. We have consolidated our sales channels into one, aiming to establish a system that enables us to gather information and identify customer needs more quickly and accurately. While paying more visits to our customers and offering appropriate technologies and services, we are committed to further strengthening relationships with our customers and improving customer satisfaction. Our initiatives also include achieving even higher customer satisfaction by leveraging the strength of the sales division of NTN Corporation with established brand recognition and exceptional development activities, and NTN Bearing Service Co., Ltd. offering its speedy yet detail-oriented services.

On the supply side, we will aim to strengthen our supply capacity by promoting utilization of products manufactured overseas and efficiently utilizing global stock, and expand the inventory lineups of top-selling products for the aftermarket, in an effort to establish a supply structure that is unaffected by trends in OEM demand.

In addition, with the aim of expanding the aftermarket business centered on MRO on a global basis, we are working to strengthen technical services for customers and distributors. We are striving to expand sales by enhancing technical service unit activities and NTN Aftermarket Academy, which are intended for teaching basic techniques and maintenance techniques for bearings, and providing a wide range of services including trainings by specialists well versed in skills such as mounting/removing bearings and prompt sharing of technical information. We are also working to improve packages and renew designs of individual boxes, and introduce technologies for measures against counterfeit bearings, in an effort to further strengthen our brand image.



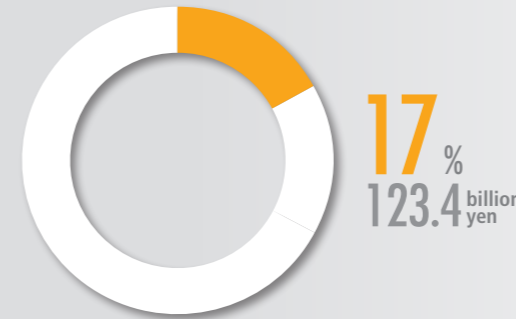
We produce NTN ULTAGE Series, the world's highest class new generation bearings, which meet the market needs for higher precision and speed of industrial machinery. Our company is also contributing to reduce environmental impact in various fields in industrial machinery by making our bearings lower torque, smaller and lighter. We will contribute to industrial development and creation of sustainable society, through further evolving elemental technologies of bearings that we have cultivated over many years, and promoting development of high value-added products by unitizing or systemizing peripheral components.



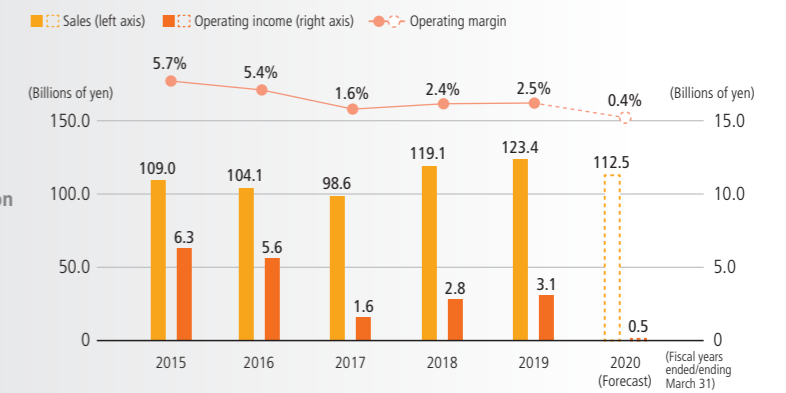
Managing Executive Officer  
Kazuki Kawashima

# Industrial machinery market

Percentage of total sales



Trend in business performance



## Business environment

We provide products to customers in various sectors of industrial machinery, incorporating a wide range of technologies and production methods. We believe that the business environment differs between the core sectors leading the market and the sectors with strong growth prospects. On the other hand, energy saving, long-term stable operations, and reduction in lifetime costs are common tasks appointed by each industry. In order to meet these needs, we believe that it is necessary to use advanced IoT and sensing technologies to provide services such as condition monitoring services designed for predictive maintenance. In addition, it is necessary to establish a production system that can respond promptly to fluctuations in demand, which is affected by national policies and global economy, and to strengthen our productivity including that of suppliers.

### Changes in market environment

Rising needs for autonomous machinery operations and sensing technologies	Competition in development of high value-added products
Impact of policies, trade issues, and global economy on demand	Intensified competition due to the influx of low-priced products

### NTN's strengths

#### For core sectors

Ability to develop high-speed, high-rigidity and high-precision products

Ability to respond to new needs in fields and parts which are yet to be tapped into

Strong relationships with manufacturers with the top shares in the industries

#### For growth sectors

Ability to develop products tailored to customer needs

Experience in doing business with world's major customers

Ability to produce products of the sizes that other companies cannot produce



## Results for the fiscal year ended March 31, 2019

Sales were 123.4 billion yen, up 3.6% from the previous year, supported by strong demand for construction machinery in Japan and Asia, wind turbines in the Americas, machine tools in Europe, and aircraft driven by the start of new jet engine. Operating income was 3.1 billion yen, up 11.1% from the previous year due to the effect of the increase in sales volume despite increased costs such as rising prices of steel and supplementary materials.

## Forecast for the fiscal year ending March 31, 2020

Net sales is forecast to be 112.5 billion yen, down -8.8% from the previous fiscal year, due to a decline in demand for products for construction machinery and machine tools in various regions, despite increased demand for products for rolling stock in Japan, Europe and China, demand for aircraft in Europe, and demand for wind turbines in China. Operating income expects to result in 0.5 billion yen, down -83.9% from the previous fiscal year, due to the impact of a decline in volume, despite efforts to strengthen production capacity in response to fluctuations in customer demand, improve internal and external productivity, including those of suppliers, and promote the acquisition of new projects with reasonable profits by focusing on industries that are expected to grow over the medium to long term.

## DRIVE NTN100 strategies and progress

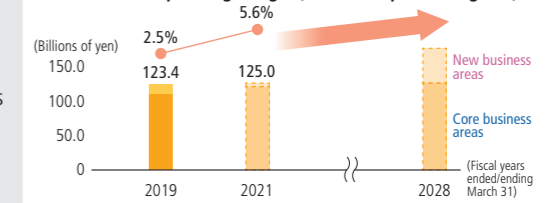
### Strengthen core technologies and products

In the industrial machinery market, in 2018, we developed the industry's first "Sensor Integrated Bearing Unit" with a built-in heat flow sensor for machine tools applications. This product makes it possible to prevent bearing seizure, which would cause a main spindle failure, with advanced condition monitoring. Furthermore, with our proprietary air-cooling technology, we have developed "Machine Tool Spindle Bearing with Air Cooling Spacer for Grease Lubrication" for machine tool spindles, featuring both high-speed rotational performance and high-rigidity, and Angular Contact Ball Bearing for High-Speed and Heavy-Cutting Machine Tools, which is an advanced combination of high-speed rotational performance and load resistance. By actively proposing these new products in addition to existing products, we will contribute to further improving the productivity of our customers. In addition, in 2018, we started production of ultra-precision bearings at NTN Mettmann (Deutschland) G.m.b.H. in Germany for the first time overseas. We will expand our business by acquiring new customers through increasing supply capacity and shortening lead times for bearings for machine tools applications on a global basis.

### Develop businesses in new areas

We are accelerating the development and provision of innovative technologies, products and services in response to the new needs, such as the spread of IoT and the utilization of AI in the industrial machinery market. In the robot related business, we have accelerated the development of our unique wrist joint module "i-WRIST™" and began its mass production. "i-WRIST™" moves in the same way as human wrist does even in a small space. Taking advantage of this feature, we are proposing the introduction of an automation system for appearance inspection and grease applicators. Going forward, we will reinforce the coordination with Slers (system integrators) and provide technical services such as reducing the customers' man-hours when designing equipment. In the service/solutions business, we are accelerating introduction of Condition Monitoring Systems (CMS) for wind turbines. We have also utilized the bearing diagnosis and vibration analysis technologies that we have cultivated for many years to develop "Portable Vibroscope" that is easy to operate and can detect failures in bearings. We will strengthen tools for diagnosis and analysis of bearings and diagnostic technology services, and expand the service/solutions business to offer technologies for extending the total life cycle of equipment, reducing downtime and improving production efficiency.

Net Sales and Operating Margin (actual and planned figures)



## OUR VISION

### NTN will become a company that customers in the industrial machinery market rely on most for its exceptional technological competence

In the industrial machinery market, NTN widely covers various segments and machines of customers, and supplies bearings from miniature sizes used in electronic devices to extra-large sizes used in wind turbines and large mining machines. Our customers request high reliability on the products used in aircraft and high-speed trains, which are directly linked to human life. NTN has always met various market needs, with accumulated technologies on products and productions.

Recently, the external environment is rapidly changing, with increasing awareness of global environmental issues and demographic shifts. The industrial structure itself is also changing as a result of the fast evolution of information technology, such as IoT and AI. By utilizing digital technologies along with the flexible intelligence and creativeness of mankind, we remain to be an indispensable company in the industry, and support the development of the industrial world.

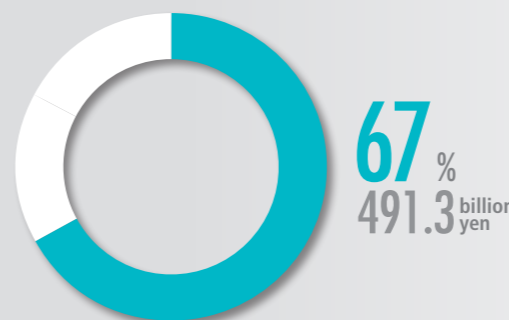
Our work in the automotive segment includes developing more advanced bearings, hub bearings and driveshafts to create higher added value. We are also combining these core products with core technologies to develop module products. To prepare for the coming era of electrification and autonomous driving, we have released "Electric Motor and Actuators" composed of ball screws, motors and controllers. We are working on expanding their range of applications and proposing them to customers. Marketing these products globally will allow us to meet demands for better fuel efficiency and ride comfort in conventional vehicles, while also meeting rapidly growing needs for electrification.



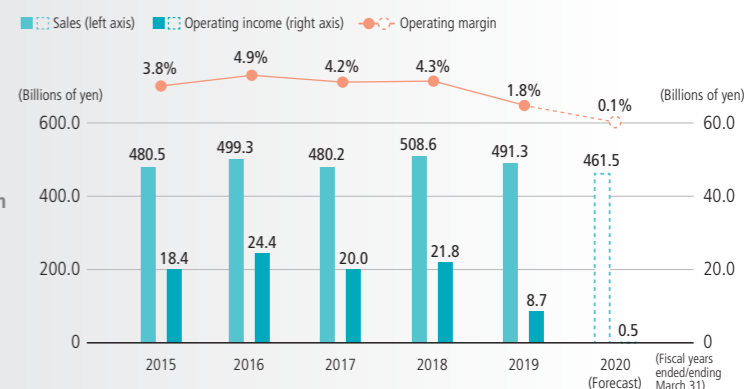
Representative Executive Officer  
Senior Managing Executive Officer  
**Hideaki Miyazawa**

# Automotive market

Percentage of total sales



Trend in business performance



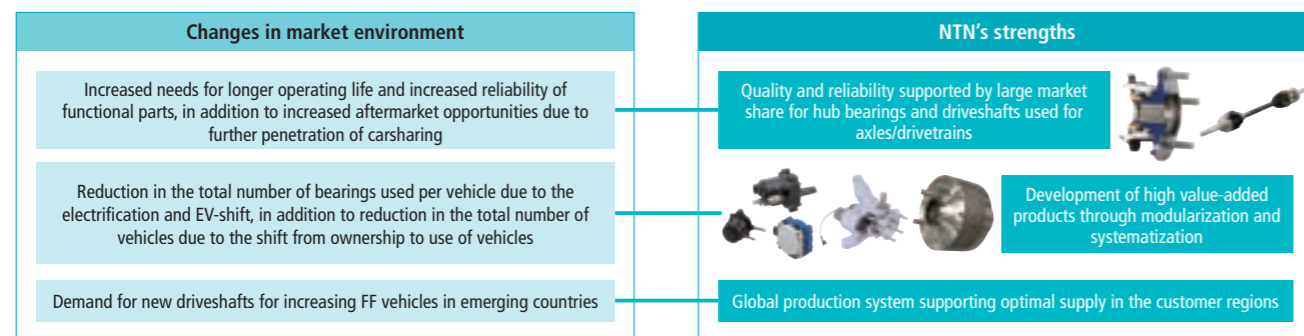
## Business environment

The automotive industry has entered a period of major changes, such as CASE\*1 and MaaS\*2 that incorporates it. We believe that success of a company depends on how it transforms the risks associated with changes into growth opportunities.

With the EV-shift, there is a risk that demand of bearings may decline as a transmission that uses a lot of bearings is replaced with a gearbox that has a simple structure. In addition, the shift from ownership to sharing may reduce the number of vehicles in the market and further commoditize them as tools, intensifying price competition.

On the other hand, we expect that needs specific to EVs will increase, such as those for quietness, low vibration and high-speed rotation, and that the market related to sensing technologies and failure detection functions including CMS that are essential for autonomous driving vehicles will expand. In addition, carsharing is expected to increase utilization rate of each vehicle, leading to increased needs for parts durability and increased demand for service parts.

We recognize that the ever-changing automotive industry is now offering suppliers a business environment that presents chances for advancement as well as risks for survival.



\*1 An acronym for "Connected," "Autonomous," "Shared/Service" and "Electric"—four words representing developments that are currently on the verge of creating major changes in the automotive industry.  
\*2 A new concept of "Mobility," which offers cloud-based transportation services by utilizing information communication technology and seamlessly connects all modes of transportation other than private vehicles as a single service

## OUR VISION

**As an indispensable presence for the automotive market, NTN will become a company that offers products and services for vehicles all over the world**

The rise of electrified vehicles throughout the world's automotive markets calls for functional automotive components with different characteristics or more rigorous performance requirements than are required for conventional internal combustion engine vehicles. We will accommodate these needs by offering different technical expertise and lineups of advanced products providing features such as size/weight reduction, higher speed rotation, lower torques and less noise/vibrations in order to secure a competitive advantage over the competitors.

Ride-sharing and autonomous driving are two other major trends that are expected to change the landscape of the automotive market. Providing these functions will require

absolute reliability from the drivetrains responsible for vehicle driving, turning and stopping performance. Carmakers are shifting the focus and resource of their development work from the tangible (vehicle performance) to the intangible (services), creating an expanding range of areas in which NTN can contribute to vehicle safety, reliability and comfort.

We view these dynamic changes in the market environment as opportunities. We will work to provide values that exceed customer expectations through product development and advanced technical services that incorporate future market needs. We aim to become a leading manufacturer in the automotive market's crucial drivetrain component segment.

## Results for the fiscal year ended March 31, 2019

Sales were 491.3 billion yen, down 3.4% from the previous year, reflecting the decline in demand due to the Worldwide harmonized Light duty driving Test Procedure (WLTP), new standard for measuring CO<sub>2</sub> emissions in Europe, U.S.A.'s sanctions against Iraq, slow responses of vehicle manufacturers to the demand shift from diesel engines to gasoline engines, etc. as well as the sharp economic downturn in China in the second half of the fiscal year caused by the trade friction. Operating income was 8.7 billion yen, down 60.3% from the previous year, reflecting the impact of the reduction in sales volume in Europe and China as well as the increase in costs including rising prices of steel and secondary materials, and additional tariffs in the U.S.A.

## Forecast for the fiscal year ending March 31, 2020

In Europe, the impact of negative factors seen in the previous year remains, and demand is weak due to uncertainty about the U.K. departure from the EU. In addition, China also expects vehicle sales to be sluggish due to the prolongation of trade friction with the U.S. and the introduction of new exhaust gas regulations (country 6). In other, we expect relatively firm demand and a net increase in new projects. However, we expect result in sales of 461.5 billion yen, down -6.1% from previous year. Operating income expects 0.5 billion yen, down -94.3% from previous year, despite mitigating the impact of additional tariffs on U.S.A. by promoting the switch to local procurement and manufacturing, and passing on rising prices of steel, secondary materials, and transportation.

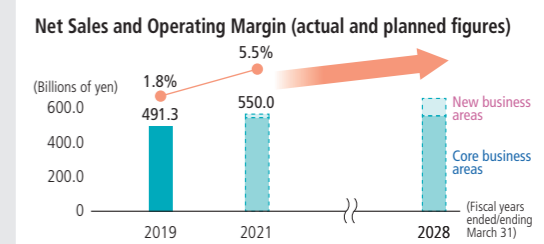
## DRIVE NTN100 strategies and progress

### Strengthen core technologies and products

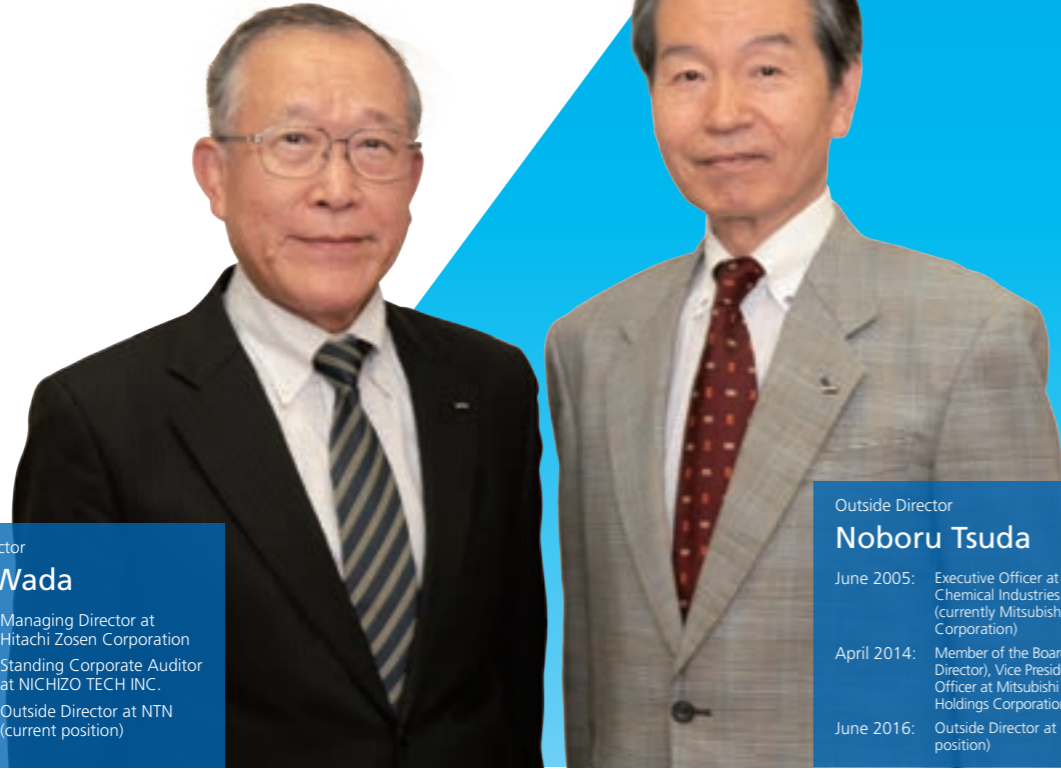
We work to differentiate our core products such as hub bearings and driveshafts with the No.1 and No.2 market share in the world respectively by product development and technical services that meet the universal needs such as low friction and light weight and the requirements specific to CASE. The fixed constant velocity joint "CFJ-W" we developed in 2018 achieved the world's highest maximum operating angle of 55° and an approximately 50% reduction in torque loss. In May 2019, we launched "Low Friction Hub Bearing III", which has reduced rotational friction by 62% compared to conventional products and improved vehicle fuel efficiency. In addition, development projects and mass production adoption by emerging EV manufacturers are increasing, and our customer base is also being diversified. At the same time, we will make steady efforts to improve our Monozukuri efficiency and reinforce our global procurement function, maximize the scale benefits of our core products that have high market shares, and secure earnings to reinvest in new areas.

### Develop businesses in new areas

We are accelerating development of innovative technologies, products and services that make use of the core technologies we have cultivated in our core businesses, and are working to respond to new needs such as electrification and autonomous driving. In 2018, we developed "sHUB," a hub bearing with steering assist function, and started to make proposals to customers. It is expected not only to improve steering stability and fuel efficiency of the vehicles, but also to be applied for risk avoidance operation of autonomous driving vehicles. In addition, "eHUB," which combines a hub bearing and a motor, has functions of both drive assistance and electric power regeneration when decelerating, and contributes to improved fuel efficiency in combination with the 48V Mild HV. Furthermore, "Electric Motors and Actuators," which combine bearings and ball screws technology with motor design technology and electrical control technology, can be used for electrification of accessories such as pumps and brakes. We will work on mass production and commercialization of these new products with a sense of urgency, to expand new business areas.



# Outside Director Dialog



Outside Director  
**Akira Wada**  
 June 2005: Managing Director at Hitachi Zosen Corporation  
 June 2006: Standing Corporate Auditor at NICHIZO TECH INC.  
 June 2011: Outside Director at NTN (current position)

Outside Director  
**Noboru Tsuda**  
 June 2005: Executive Officer at Mitsubishi Chemical Industries Limited (currently Mitsubishi Chemical Corporation)  
 April 2014: Member of the Board (Representative Director), Vice President Executive Officer at Mitsubishi Chemical Holdings Corporation  
 June 2016: Outside Director at NTN (current position)

In the Outside Director Dialog which was held for the first time last year, a frank and outspoken talk was held on the issue of governance for NTN and its approach to value creation. It's been a year since then. This time, those two Outside Directors are back to have a heated talk about the new issues for NTN again.

## TOPIC 1

### Issues in the globalization of the head office

Regarding issues in the globalization of the head office (e.g. delayed integration of domestic and overseas organizations, clarification of responsible areas, etc.) which were pointed out last year, how were those issues discussed at the Board of Directors and how was the situation changed over the past year?

### Shift from individual optimization to total optimization

**Tsuda:** Though it is difficult to make a drastic change in a year, but I feel that the points of our remarks as Outside Directors last year are consciously discussed at the Board of Directors. We can mention the reform of global procurement as one of them. The variable cost reformation has improved greatly over the past year. Since it is just in the beginning stage, the key point will be how it will function going forward. Another is the Supply & Demand

Center\*. Regarding those two, I think that at least we came to the starting line over the past year.

**Wada:** As Mr. Tsuda said, it is hard to make a drastic change in a year, but I feel that the Board of Directors has gradually changed according to our remarks during these 8 years of our services as Outside Directors. The appointment of Mr. Herve Brelaud\* as the Operating Officer in charge of Procurement Headquarters this year is also a significant change. The talent within NTN had been conventionally appointed to such position. So, we would say that the appointment of the talent from SNR, a French subsidiary acquired by NTN, is a meaningful change. Following this appointment of European talent as the head of global procurement at the head office, I expect two changes. Firstly, this appointment should enable us to learn the way of thinking and approach from their point of view. Secondly, perhaps there may have been certain hesitations particularly as an acquired subsidiary, however, now that such talent is a part of the head office, I expect improvements in the communication. Joining forces of human resources from both the NTN head office and overseas would lead to vitalization of our business in Europe.

\* Supply & Demand Center: Newly established in October 2018 to improve inventory turnover ratio, operational efficiency, and on-time delivery rate through integrated and centralized management while rebuilding the core IT system.

\*Mr. Herve Brelaud is served as Deputy General Manager, Europe & Africa Region, and Vice President, NTN-SNR ROULEMENTS. He was appointed as the Operating Officer in charge of Procurement Headquarters in 2019.

**Tsuda:** We have had many discussions through TV conferences. But, there are some things that can be discovered only by meeting each other face-to-face. Another issue which I need to carefully observe as the Outside Director is whether we can globally develop the appropriate system of supply and demand or not. In October 2018, the Supply & Demand Center was established, including the rebuilding of the core IT system. Through this, if the comparison of costs in Japan and overseas can be confirmed within a single division, we can make our decisions globally including procurement. However, the problem is that, while procurement itself can operate smoothly once the framework is established, the supply and demand is a different matter. We need to coordinate between business divisions as well as between manufacturing and sales divisions. It is not like we can sit back and relax once the framework is established. Needs are different in each business site including subsidiaries in Japan and overseas. It is important to aim for total optimization, but this is the management issue which can't be judged overnight, if we consider net sales and performance evaluation. Firstly, we need to get the Supply & Demand Center off the ground in Japan. Then, it may be another 2 or 3 years until we can extend it globally. The Supply & Demand Center is currently served as a "mediator" between business divisions, so there is a certain situation where a certain department is forced to be patient as a result of power relationship between business divisions. The capability of the Supply & Demand Center will be the key issue going forward.

**Wada:** That's right. The most challenging task at the Supply & Demand Center is to coordinate different business approaches required by each business division. Regarding the automotive business, we can grasp the customers' needs yearly. So, the mass production according to the plan is possible. Meanwhile, the industrial machinery business rather tends to meet customers' specific needs by tailor-made services, compared with the automotive business, therefore a close communication with the manufacturing site is necessary. From the perspective of manufacturing site, the mass production such as automotive business is easy to proceed and easy to secure profits. So, such business tends to be prioritized. It is difficult to coordinate because slowing down this mass production system leads to low profitability. Also, though the aftermarket business shows high profitability, this is a result of the mass production effect coming from OEM of automotive business. What aftermarket business needs is diversified products in small production. But if we are to meet such needs as they are at the manufacturing site, then we can't ensure profitability. To what extent we should meet such needs of aftermarket business; it is difficult to find the right balance. And this is where the judgment of the management is really put to the test. It is important to change our corporate culture which aims for mass production of high-quality products, the Supply & Demand Center plays one of the key roles for this change. The supply and demand were conventionally determined by each business division for the most parts, which is to say individual optimization. If we try to do this at the initiative of the Supply & Demand Center, some divisions can enjoy its merit, but it can be at the cost of some other divisions or manufacturing sites. This coordination

is very difficult.

**Tsuda:** The weak financial performance for recent years is also the issue to be solved. Of course, there is an influence of some external factors, but the entire officers and employees must have a sense of crisis. That's how serious it is. We have to think of the future on the assumption of current situation. We have to think in a shorter time span and manage our business with more sense of crisis.

**Wada:** We are facing the situation where we can increase sales by manufacturing all products as usual, but not profits. We need to pursue issues, such as decision making between in-house production or outsourced, more strictly by profit-first thinking. Moreover, we need to judge to what extent we should meet customers' needs. From customers' point of view, of course they prefer our products to be produced in-house. However, in consideration of sales, sometimes we have to make other proposals convincing enough for them. Things are not what they used to be, shifting from small variety in mass production to more variety in small production. In such situation where sales increase but profit decrease, efficiency at manufacturing site is essential or otherwise we become exhausted. How to break through this difficult situation will be the key issue.

**Tsuda:** As you said, the question is whether the management has the fortitude to lose orders with low profitability or not. Just because the sales decline as a result of placing priority on the total optimization, the evaluation of manufacturing divisions or manufacturing subsidiaries in charge of it should not be lowered. Even if sales should decline in the annual plan, we need to find the appropriate way of evaluation, such as comparing the results within the annual plan instead of year on year.

## TOPIC 2

### Marketing issues

Last year, regarding marketing issues, you pointed out the difference in marketing methods for products closer to B-to-C rather than conventional B-to-B, and the delay in response to such marketing. How has the situation changed?

### Importance of alliance

**Wada:** Newly emerging nations will eventually take the place of main manufacturers for simple bearings. Also for B-to-B market, high value-added special bearings, such as unitized bearings, will be in demand. Meanwhile, regarding new businesses, we have some promising products which may possibly have a potential for gaining a nationwide market share. Needs for products closed to end users, such as disaster response products in natural energy business, will see further growth. Though the scale of sales of green energy products business is not so big yet, it is important to increase the sales steadily. Also, it is important to find what customers want, which are seeds for survival in the next generation, by sharing customers' opinions and information the sales



divisions have gotten in the course of promotion of bearings with the development divisions and technology divisions more proactively and globally.

**Tsuda:** I feel that it is quite difficult to cover the marketing for new businesses only by our human resources. At the same time, it is not realistic to hire many employees ahead of development of new businesses, so the partnership will become really important. We need to shift from doing all by ourselves to cooperating with partners. As I said last year, when we form partnership, we need a product attractive and superior enough to collaborate, and must choose partners who actually have it.

**Wada:** I also recognize the importance of partnership. Wrist Joint Module (i-WRIST) is a great example. The collaboration with the partner which has a brilliant visual technology enabled us to produce a competitive device which is useful for a product acceptance judgment at the final inspection of production site. This product also meets needs for manpower reduction in future. I think there are many other companies who think they can produce better products by combining our technological capability through partnerships.

**Tsuda:** Of course, new businesses are important, but the fact remains that we also need to prioritize the drastic improvement of profit from existing businesses. We need to analyze fundamental causes of decline of profit, and change existing businesses as well. Under the current circumstances where the amount of investment has ballooned due to the system investment, and personnel expenses have increased globally, if we carry on existing businesses in the same method and same manpower as before, our business will recede as a matter of course. We need to thoroughly analyze and discuss how manpower reduction has been carried out, and what our weaknesses are when compared to competitors, be it the procurement or the presence of situation where we have to choose unprofitable products in our product mix, etc. Though we did have a sufficient discussion at the time of formulation of our Medium-term Management Plan, the current status in some areas are out of its course, so we need to place the first priority on analyzing the current financial performance and taking measures for improvement. The situation where we are busy but profitability does not improve, and consequently the salary doesn't increase and motivations of employees go down. I think that the Board of Directors needs to deliver a very powerful message regarding this. Capital investment for decrepit factories; for manpower reduction; and that

requires configuration of core system such as the Supply & Demand Center; there are many capital investments we need to accomplish. Meanwhile, as external circumstances are worsening, it is really important to prioritize what we should invest under the estimated cash flow, whether we should place priority on investment even if the financial performance is severe, or we should refrain from investing in such case. So, these prioritizations are very important and I must say that steering our company has grown quite difficult.

TOPIC 3

Changes in the Board of Directors over the past year

We held our first ESG briefing session for institutional investors at the end of the last year, and created the first opportunity for a dialog between the president and employees in February 2019. As all these show the positive moves in the management to adopt opinions of investors and employees, did you feel any changes in the Board of Directors over the past year?

Raising speed and motivation by separation of execution and supervision

**Wada:** It is a fact that we are going in a right direction, although you may not actually feel it in the midst of the management.

**Tsuda:** We can exchange frank and honest opinions in the Board of Directors, but on the other hand, I often feel that we take much time unnecessarily to discuss topics which we don't have to. I have been thinking that we should remove such unnecessary topics. This being part of the reasons, we decided to make a transition in our organizational design from a Company with Board of Company Auditors to a Company with Nominating Committee, etc. this year.

**Wada:** This is a significant change. This shows the commitment to advance while valuing our roles as Outside Directors. I'm looking forward to what this change will bring. As Mr. Tsuda said, discussion at the Board of Directors so far in fact included many minor topics which should have been originally decided by execution divisions. It is important to separate functions of execution and supervision, and encourage execution divisions to responsibly make decisions on their own. Conventionally, our company has had the corporate culture where important matters were decided by the Board of Directors. However, we shifted from the attitude of waiting for top-down decisions to the organizational structure where execution divisions shall properly fulfill their responsibilities in execution. I expect that this change enables us to develop the environment where speedy corporate decision making allows employees to work proactively and raise their motivation.

**Tsuda:** That's right. In the Board of Directors in the past, I felt the fact that decisions were made by everyone was one of the reasons why who bears the responsibility became unclear. Minor topics, such as whether each capital investment is reasonable or not, were included in the agenda of the Board of Directors, and we couldn't spend enough time on really necessary discussions, such as what field we should focus more

preferentially to improve profitability, and in what scale of invest framework. As I pointed out earlier, the Supply & Demand Center is served as a "mediator" between business divisions. I believe discussion on such issue at the Board of Directors will enable us to make a decision for the total optimization which can't be judged by execution divisions. It will be important to concentrate on the intrinsic matters to be discussed at the Board of Directors, such as checking the progress of plans which were formulated in the past, or decision of our major policy, in addition to deciding on the criteria for evaluation, human resources, and compensation. However, creating the organizational structure alone will be meaningless. Only after putting our hearts into it, the new structure can carry its true meaning.

**Wada:** Previously, there were only 2 Outside Directors, but the Outside Audit & Supervisory Board Members will join our discussion as Outside Directors from now on. Since the Audit & Supervisory Board had its good function, we hope that participation of the Audit & Supervisory Board Members in the Board of Directors as Outside Directors will bring such good aspects into the Board of Directors and make it work.

**Tsuda:** Going forward, I believe the Board of Directors will become to function in such way as hearing opinions of execution divisions at the early stage before determining a budget before discussions. Also, as the number of Outside Officers increased to 5, I expect the Board of Directors to be proposal-based where discussions and requests of Outside Officers are presented to execution divisions and the Board of Directors.

TOPIC 4

A message after looking back on the past year

What is the message from Outside Directors after looking back on the past year?

"Danshari" by the management: judging what is truly necessary for our company

**Wada:** "People, products, and money" are often mentioned as major management resources, but after all, human resources are the most important factor. We live in the world where the speed is increasingly becoming the top priority, and the most important factor is human resources. Personnel Department should grasp the performance of all employees, but furthermore, personnel decisions for ones who take the leadership in future is extremely important. The responsibility of the Manager of Personnel Department is tremendous. In order to make appropriate decisions, I want Personnel Department to have a great manpower. It is essential to ensure better human resources for survival of NTN in future, and 1 or 2 years are not enough to see results. We hope that we will be able to hear comments such as "human resources in NTN have changed" 5 or 10 years later.

**Tsuda:** We need to think about how we make use of external resources. In the same way as new businesses, we also need to consider different alternatives for human resources, not



only developing within our company but also externally recruiting human resources who are capable of management. This approach is especially important in overseas subsidiaries. A company of our scale cannot be managed only by internal human resources. Also, such company tends to fall into a vicious practice of "following precedent," due to the lack of external point of view. In business, I always think that we should never just follow precedent, but it is external human resources who let us know whether our action is just following precedent or not. Therefore, it is important to interact with various companies and people outside. We should not fall into a vicious practice of "following precedent," and sometimes "swings and roundabouts" is necessary.

**Wada:** The reform of marketing is also required. Since the economy in Osaka is declining, the organization which puts out our antenna to grasp customers' needs becomes important. For example, the development divisions and Automotive Business Headquarters have moved to Tokyo where we can grasp customers' needs more easily. That's a great decision. Although our company tends to prefer proceeding all processes by ourselves, we need to consider outsourcing as necessary, otherwise the increase is only in the number of employees while profitability decreases.

**Tsuda:** Under the circumstances where the work style reform is promoted to reduce overtime work, only requesting employees to reduce overtime work just results in making them feel more stressful. The work style reform is a kind of "Danshari", the corporate judgment of what is truly necessary for our company. It requires extremely important managerial judgment of what to choose and what to abandon. This is the current major issue for our company.

**Wada/Tsuda:** The number of Board of Directors decreases as a result of the transition to a Company with Nominating Committee, etc., and its function will change drastically, such as a decrease of number of proposals to be resolved by the Board of Directors. Previously, directors acted on behalf of responsible managers of execution divisions in all matters at the Board of Directors. However, we expect more opportunities for candidates for directors and executives in the next generation to report directly, as we proactively invite responsible managers of execution divisions and staff in charge. Through such discussions, we also would like to make the Board of Directors as a useful place to find great talents.

**Officers** (as of June 25, 2019)



(Back row from left to right)

Director

**Toshinori Shiratori**  
Managing Executive Officer

Director

**Hideaki Miyazawa**  
Representative Executive Officer,  
Senior Managing Executive Officer

Director

**Hiroshi Ohkubo**  
Representative Executive Officer,  
President, Executive Officer

Director

**Yoshinori Terasaka**  
Representative Executive Officer,  
Senior Managing Executive Officer

Director

**Eiichi Ukai**  
Managing Executive Officer

Director

**Hironori Inoue**

Outside Director

**Ryo Kawakami**

Outside Director

**Noboru Tsuda**

Outside Director

**Kouji Kawahara**

Outside Director

**Akira Wada**

Outside Director

**Tadao Kagono**

**Officers** (as of June 25, 2019)

**Directors**

■ Members of Nominating Committee 
 ■ Members of Audit Committee 
 ■ Members of Compensation Committee 
 ★ Chairman of each committee

Name	Title	Age	Years of Service as Director	Number of Board of Directors Attended <small>(Fiscal year ended March 31, 2019)</small>	Number of Company's Shares Held <small>(As of March 31, 2019)</small>	Reason for Selection
<b>Hiroshi Ohkubo</b> <span style="color: green;">■</span> <span style="color: pink;">■</span>	Director	<b>66</b> years old <small>(born on May 14, 1953)</small>	<b>7</b> years	<b>100%</b> <b>19</b> out of 19 times	94,900 shares	Mr. Hiroshi Ohkubo possesses operational experience in areas such as the Finance Division and Overseas Division, and broad knowledge of company management for promoting business globally based on these achievements, and has served as President and Representative Director of the Company since June 2014. The Company selects him with an aim to continuously improve corporate value, utilizing his experience and knowledge, etc.
<b>Hironori Inoue</b> <span style="color: green;">■</span> <span style="color: yellow;">■</span>	Director	<b>67</b> years old <small>(born on July 29, 1951)</small>	<b>9</b> years	<b>100%</b> <b>19</b> out of 19 times	73,200 shares	Mr. Hironori Inoue possesses operational experience in areas such as the Production Division and the Human Resources Division and broad knowledge based on these achievements. The Company selects him with an aim to continuously improve corporate value, utilizing his experience and knowledge, etc.
<b>Yoshinori Terasaka</b>	Director	<b>59</b> years old <small>(born on August 30, 1959)</small>	<b>6</b> years	<b>100%</b> <b>19</b> out of 19 times	50,400 shares	Mr. Yoshinori Terasaka possesses operational experience in areas such as the Research Division, Engineering Division and Business Division for the automotive market, and broad knowledge based on these achievements. The Company selects him with an aim to continuously improve corporate value, utilizing his experience and knowledge, etc.
<b>Hideaki Miyazawa</b>	Director	<b>58</b> years old <small>(born on October 18, 1960)</small>	<b>5</b> years	<b>89.4%</b> <b>17</b> out of 19 times	60,500 shares	Mr. Hideaki Miyazawa possesses operational experience in areas such as Business Divisions for the automotive market and Overseas divisions, and broad knowledge based on these achievements. The Company selects him with an aim to continuously improve corporate value, utilizing his experience and knowledge, etc.
<b>Toshinori Shiratori</b> <span style="color: pink;">■</span>	Director	<b>60</b> years old <small>(born on July 13, 1958)</small>	<b>4</b> years	<b>100%</b> <b>19</b> out of 19 times	33,600 shares	Mr. Toshinori Shiratori possesses operational experience in areas such as the Human Resources Division and the Corporate Strategy Division, and broad knowledge based on these achievements. The Company selects him with an aim to continuously improve corporate value, utilizing his experience and knowledge, etc.
<b>Eiichi Ukai</b>	Director	<b>62</b> years old <small>(born on February 1, 1957)</small>	<b>2</b> years	<b>100%</b> <b>19</b> out of 19 times	48,500 shares	Mr. Eiichi Ukai possesses operational experience in areas such as Quality Assurance Division and Overseas Division, and broad knowledge based on these achievements. The Company selects him with an aim to continuously improve corporate value, utilizing his experience and knowledge, etc.
<b>Akira Wada</b> <span style="color: green;">■</span> <span style="color: pink;">★</span>	Outside Director	<b>74</b> years old <small>(born on January 17, 1945)</small>	<b>8</b> years	<b>100%</b> <b>19</b> out of 19 times	45,200 shares	Mr. Akira Wada possesses broad knowledge based on extensive experience in the management of other companies. The Company selects him with an aim to secure validity and legality of management and continuously improve corporate value through his appropriate advice and suggestions from an independent standpoint, utilizing his experience and knowledge, etc.
<b>Noboru Tsuda</b> <span style="color: green;">★</span> <span style="color: pink;">■</span>	Outside Director	<b>69</b> years old <small>(born on November 25, 1949)</small>	<b>3</b> years	<b>100%</b> <b>19</b> out of 19 times	17,300 shares	Mr. Noboru Tsuda possesses broad knowledge based on extensive experience in the management of other companies. The Company selects him with an aim to secure validity and legality of management and continuously improve corporate value through his appropriate advice and suggestions from an independent standpoint, utilizing his experience and knowledge, etc.
<b>Kouji Kawahara</b> <span style="color: green;">■</span> <span style="color: yellow;">★</span>	Outside Director	<b>58</b> years old <small>(born on February 3, 1961)</small>	<b>4</b> years*	<b>100%</b> <b>19</b> out of 19 times	23,100 shares	Mr. Kouji Kawahara possesses extensive experience in banking over many years and broad knowledge including finance, and since June 2015, he has been performing his duties as a standing Audit & Supervisory Board Member of the Company. The Company selects him with an aim to secure validity and legality of management and continuously improve corporate value through his appropriate advice and suggestions from an independent standpoint, utilizing his experience and knowledge, etc.
<b>Tadao Kagono</b> <span style="color: yellow;">■</span>	Outside Director	<b>71</b> years old <small>(born on November 12, 1947)</small>	<b>15</b> years*	<b>100%</b> <b>19</b> out of 19 times	34,500 shares	Mr. Tadao Kagono possesses broad knowledge based on extensive experience as an academic specializing in management, and since June 2004, he has been performing his duties as an Outside Audit & Supervisory Board Member of the Company. The Company selects him with an aim to secure validity and legality of management and continuously improve corporate value through his appropriate advice and suggestions from an independent standpoint, utilizing his experience and knowledge, etc.
<b>Ryo Kawakami</b> <span style="color: yellow;">■</span> <span style="color: pink;">■</span>	Outside Director	<b>51</b> years old <small>(born on October 1, 1967)</small>	<b>4</b> years*	<b>84.2%</b> <b>16</b> out of 19 times	- shares	Mr. Ryo Kawakami possesses broad knowledge based on extensive experience as a lawyer familiar with corporate legal affairs, and since June 2015, he has been performing his duties as an Outside Audit & Supervisory Board Member of the Company. The Company selects him with an aim to secure validity and legality of management and continuously improve corporate value through his appropriate advice and suggestions from an independent standpoint, utilizing his experience and knowledge, etc.

\*Including years of service as Audit & Supervisory Board Member.

**Executive Officers**

Name	Title	Responsible
<b>Hiroshi Ohkubo*</b>	Representative Executive Officer, President, Executive Officer	CEO (Chief Executive Officer)
<b>Keiji Ohashi</b>	Representative Executive Officer, Senior Managing Executive Officer	CFO (Chief Financial Officer) General Affairs Department EHS (Environment, Health and Safety) Integrated Management Department
<b>Yoshinori Terasaka*</b>	Representative Executive Officer, Senior Managing Executive Officer	CTO (Chief Technology Officer) New Product and Business Strategic Planning Headquarters Americas Region
<b>Hideaki Miyazawa*</b>	Representative Executive Officer, Senior Managing Executive Officer	Corporate General Manager, Automotive Business Headquarters Europe & Africa Region
<b>Itsuji Goto</b>	Senior Managing Executive Officer	CSR Headquarters Cost Planning Department China Region
<b>Eiichi Ukai*</b>	Managing Executive Officer	Aftermarket Business Headquarters Quality Assurance Headquarters NTN Korea Co., Ltd. ASEAN, Oceania & West Asia Regions India Region
<b>Takehiko Umemoto</b>	Managing Executive Officer	General Manager, EV Module Division
<b>Kazuki Kawashima</b>	Managing Executive Officer	Corporate General Manager, Industrial Business Headquarters Green Energy Products Division
<b>Toshinori Shiratori*</b>	Managing Executive Officer	Corporate General Manager, Corporate Strategy Headquarters Human Resources
<b>Hidefumi Tsuji</b>	Managing Executive Officer	Procurement Headquarters Supply & Demand Center Composite Material Product Division
<b>Masaki Egami</b>	Executive Officer	Research Division
<b>Isao Ozako</b>	Executive Officer	Corporate General Manager, Production Headquarters Production Engineering R&D Center
<b>Koji Kametaka</b>	Executive Officer	Deputy Corporate General Manager, Automotive Business Headquarters General Manager, Electric Module Products Division
<b>Tetsuya Sogo</b>	Executive Officer	Corporate General Manager, Finance Headquarters
<b>Masaaki Yamamoto</b>	Executive Officer	Deputy Corporate General Manager, Corporate Strategy Headquarters

\*Executive Officers concurrently serving as Directors

# Corporate Governance

## Basic Approach

Strengthening and enhancing our corporate governance is one of our top management priorities. We take steps to make management more efficient and robust while working to increase management transparency by disclosing information in a prompt and accurate manner to shareholders and investors.

We made a transition from a Company with Board of Company Auditors to a Company with Nominating Committee, etc. upon the approval of the 120th General Meeting of

Shareholders held on June 25, 2019 (for the fiscal year ended March 31, 2019). The purpose of this transition is to establish a prompt decision-making structure and operational execution organization, strengthen the supervision of management, and improve management transparency and fairness. Under this structure, we will work on further improvement of corporate value over the medium- and long-term.

Members composing Nominating Committee, Audit Committee, and Compensation Committee

Fiscal year ending March 31, 2020 (As of June 25, 2019)			
Directors	Nominating Committee	Audit Committee	Compensation Committee
Hiroshi Ohkubo	○		○
Hironori Inoue	○	○	
Yoshinori Terasaka			
Hideaki Miyazawa			
Toshinori Shiratori			○
Eiichi Ukai			
Akira Wada ★(Non-standing)	○		○
Noboru Tsuda ★(Non-standing)	○	○	○
Kouji Kawahara ★	○	○	
Tadao Kagono ★(Non-standing)		○	
Ryo Kawakami ★(Non-standing)		○	○

\*Please note that persons with ★ are Outside Directors, persons with ○ are Chairmen of committees, and persons with ◯ are members of committees.

**1 Board of Directors**  
The Board of Directors decides the basic management policies, and supervises the execution of duties of Directors and Executive Officers. The Board of Directors considerably delegates its authority regarding operational execution to Executive Officers, except matters stipulated by laws and regulations or the Articles of Incorporation to be resolved at the Board of Directors with the aim to strengthen the supervision of management, and make decision-making more prompt.  
The Board of Directors is held once a month in principle, but it is also held as needed with flexibility.  
The Articles of Incorporation specify that the term of office of Directors shall be one year, and the number of Directors shall be within 15. The number of Directors is 11 as of June 25, 2019, and five of them are Outside Directors. The Board of Directors is chaired by Director, President, Executive Officer.

**5 Management Meeting**  
The Management Meeting discusses important matters relating to operational execution, as a supporting body for decision-making of President, Executive Officer. The meeting is composed of President, Executive Officer, and Executive Officers who are designated by him, and held twice a month in principle.

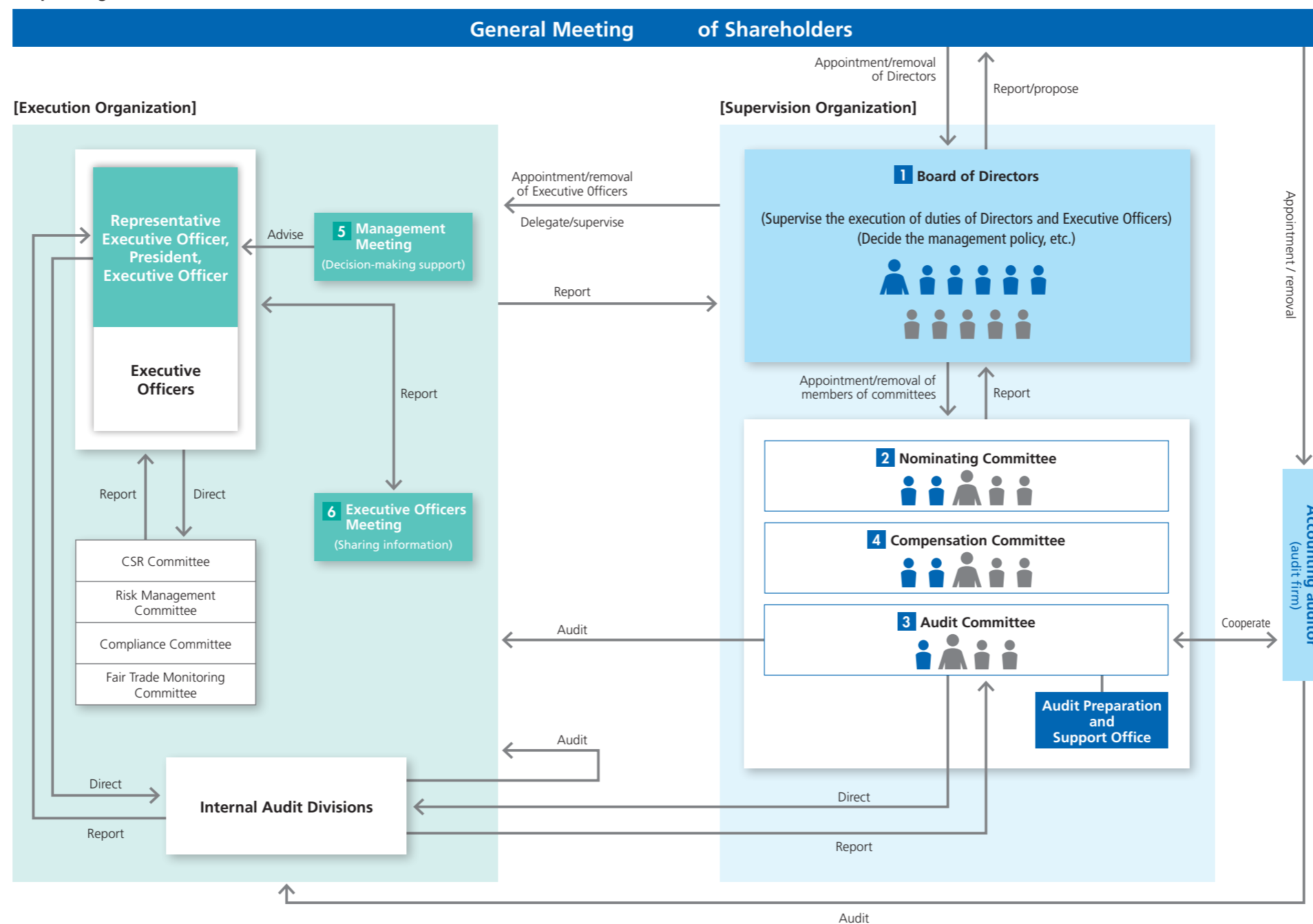
**6 Executive Officers Meeting**  
The Executive Officers Meeting is held by President, Executive Officer under the attendance of all Executive Officers. Matters resolved at the Board of Directors are instructed, and each Executive Officer reports about the status of operational execution. This meeting is held once a month in principle, to make operational execution more efficient and effective by sharing information among Executive Officers.

**Executive Officers**  
Executive Officers are elected by the resolution of the Board of Directors, and are in charge of executional decision making and execution of operations delegated by the Board of Directors. Its term of office is specified as a year by the Articles of Incorporation. The number of Executive Officers is 15 as of June 25, 2019.

**Basic Information**

Organizational design	Company with Nominating Committee, etc.
Directors	11
Of those, independent Outside Directors	5
Term of office of Directors	1 year
Executive Officers	15
Of those, Executive Officers who have the authority of representation	4
Executive Officers concurrently serving as Directors	5
Structure to support duties of Audit Committee	Available (Audit Preparation and Support Office)
Accounting auditor	Ernst & Young ShinNihon LLC

Corporate governance structure (as of June 25, 2019)



**2 Nominating Committee**  
The Nominating Committee decides on the content of a proposal regarding appointment/removal of Directors, which is submitted to the General Meeting of Shareholders. As prescribed by laws, a half or more of the members of the committee are Outside Directors. Three out of the five members of the committee are Outside Directors, and the committee is chaired by an Outside Director.

**3 Audit Committee**  
The Audit Committee audits the execution of duties of Directors and Executive Officers, and decides on the content of a proposal regarding appointment/removal of the accounting auditor, which is submitted to the General Meeting of Shareholders. As prescribed by laws, a half or more of the members of the committee are Outside Directors. Three out of the four members of the committee are Outside Directors, and the committee is chaired by an Outside Director.  
Also, the Audit Preparation and Support Office is established as an organization dedicated to support the duties of the Audit Committee, including Secretariat of Audit Committee. Regarding matters relating to appointment, personnel relocation, disciplinary punishment, evaluation, etc. of staff of the Audit Preparation and Support Office, the approval from the Audit Committee shall be required for decision.

**4 Compensation Committee**  
The Compensation Committee decides on the details of the policy for determining compensation for Directors and Executive Officers, and details of compensation for individual persons. As prescribed by laws, a half or more of the members of the committee are Outside Directors. Three out of the five members of the committee are Outside Directors, and the committee is chaired by an Outside Director.



## Corporate Governance

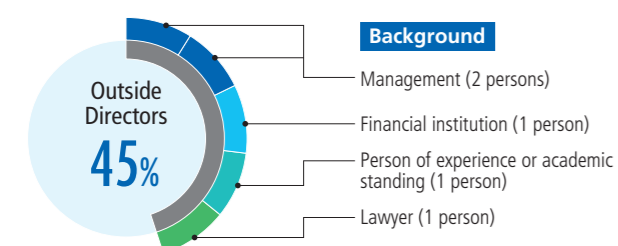
### Governance-strengthening transition

<b>2004</b>	<ul style="list-style-type: none"> <li>Start of Operating Officer System</li> <li>The Board of Managing Directors is reviewed and renamed as the Business Strategy Committee</li> </ul>	<b>2015</b>	<ul style="list-style-type: none"> <li>Compliance Committee is established</li> <li>The effectiveness of the Board of Directors is assessed</li> </ul>
<b>2006</b>	<ul style="list-style-type: none"> <li>CSR Committee is established</li> </ul>	<b>2016</b>	<ul style="list-style-type: none"> <li>Compensation Advisory Committee is established</li> </ul>
<b>2008</b>	<ul style="list-style-type: none"> <li>Risk Management Committee is established</li> <li>An Outside Director is appointed for the first time</li> </ul>	<b>2018</b>	<ul style="list-style-type: none"> <li>New corporate philosophy system is established</li> </ul>
<b>2011</b>	<ul style="list-style-type: none"> <li>The number of Outside Directors is increased from 1 to 2</li> </ul>	<b>2019</b>	<ul style="list-style-type: none"> <li>Transition to a Company with Nominating Committee, etc.</li> <li>The number of Outside Directors is increased from 2 to 5</li> </ul>
<b>2012</b>	<ul style="list-style-type: none"> <li>Fair Trade Monitoring Committee is established</li> </ul>		

### Outside Directors

We made a transition from a Company with Board of Company Auditors to a Company with Nominating Committee, etc. at the General Meeting of Shareholders for the fiscal year ended March 31, 2019. As a result, the total number of members of the Board of Directors is 11 (six Inside Directors, five Outside Directors), and the ratio of Outside Directors is 45%. The purpose of this transition is to strengthen the supervision of management and improve management transparency and fairness. In addition, in order to ensure appropriate corporate governance, we have established our own standard for independence of Outside Directors, stipulating qualification and independence standards for them. This standard is used for appointing Outside Directors. Also, all the Outside Directors are designated as independent Officers as defined by the rules of Tokyo Stock Exchange, Inc. (TSE), and are reported to TSE as such.

We send materials related to matters to be discussed at the Board of Directors to the Outside Directors in advance, and hold a briefing on the agenda items beforehand, to enable lively discussion at the Board of Directors. Moreover, we continuously provide information necessary to effectively fulfill the roles and responsibilities of an Outside Director by creating opportunities to deepen the understanding of our business through on-site inspection of business sites and other means.



#### Roles required of Outside Directors

- Taking part in the important decision-making and supervising the processes done by the Board of Directors
- Drawing on a broad range of knowledge gained through extensive personal experience to provide appropriate advice and suggestions on agenda/report items to be resolved at the Board of Directors.
- Supervising management from an independent standpoint to improve the common interests of the shareholders

#### Conditions for disposition

Within the Group, which conducts business on a global scale, Outside Directors must not only strengthen corporate governance, but also have required dispositions to aim for global business expansion, namely, achievements as a management, lawyer, certified public accountant, or academic, etc., and possess a wealth of experience and specialized knowledge.

#### Conditions for independence

An Outside Director must not be and must not have been a Director involved in operational execution, an Executive Officer, an accounting advisor, or employee of the Group at the time of assuming office and for 10 years prior to that.

At the time of assuming office and for three years prior to that, none of the following shall apply: a major shareholder, a main lender, a lead underwriting firm, a main business partner of the Group; an officer of either of those organizations; a person affiliated with the Group's accounting auditor; or a person who received significant amount of monetary compensation from the Group for consulting, accounting, or legal services.

For details of "standards for independent outside directors," please refer to the securities report. (Japanese version only)  
<https://www.ntnglobal.com/en/csr/governance/structure.html>

### Assessment of effectiveness of the Board of Directors

We made a self-assessment of the Board of Directors by sending out questionnaires to Directors and Audit & Supervisory Board Members in the fiscal year ended March 31, 2019, to improve effectiveness of the Board of Directors. The result was

generally positive, but some opinions were voiced that the effectiveness should have been further improved about the criteria and the number of matters to be discussed at the Board of Directors. Thus, we will continue to make improvements.

### Subsidiary management structure

Under the provisions of the Management Rules for Subsidiaries, we maintain a system for subsidiaries management by concluding a letter of confirmation concerning management control with subsidiaries. Under the system, subsidiaries will report the execution status of duties of their directors, and request the Company's approval for certain matters. In addition, based on the letter of confirmation, we develop systems for internal control, promotion of CSR activities, risk management, promotion of compliance activities, security trade control, and compliance of laws on competition. We also widely notify and operate a helpline (whistle-blower system) to subsidiaries as a contact point for various concerns.

#### Clarification of control structure by concluding a letter of confirmation concerning management control

- Report the status of execution of duties by subsidiaries' directors
- Application from subsidiaries for the headquarters' approval for certain issues, on the basis of authorization rules
- Development of internal control system
- Development system for promotion of CSR activities
- Compliance of basic policy of risk management
- Development system for promotion of compliance activities
- Development system for security trade control
- Instruction and audit of compliance of laws on competition

### Compensation Advisory Committee

To increase the transparency and objectivity of respective compensation particulars of Directors and Operating Officers, we have established the Compensation Advisory Committee whose majority members are Outside Officers as the advisory body of the Board of Directors.

The compensation of Directors and Audit & Supervisory Board Members is paid on the basis of the "Policy to Determine the Amount of Compensation or its Calculation Method," which was resolved at the Board of Directors.

We held seven meetings of the Compensation Advisory Committee in the fiscal year ended March 31, 2019, and held discussions on the compensation system, compensation standards, assessments and amounts of compensation for Directors and Operating Officers.

This committee was changed to the Compensation Committee in June 2019.

<b>1st</b>	<ol style="list-style-type: none"> <li>Performance of BIP Trust for compensation for Officers</li> <li>Stock compensation plan in the Medium-term Management Plan for following term</li> <li>The next meeting (the monthly compensation for Directors, the bonus for Directors and Operating Officers)</li> </ol>
<b>2nd</b>	<ol style="list-style-type: none"> <li>The amount of bonus for Directors</li> <li>The amount of summer bonus for Operating Officers</li> <li>The amount of monthly compensation for Directors</li> <li>Appointment of members of Compensation Advisory Committee</li> <li>Revision of rules of Compensation Advisory Committee</li> </ol>
<b>3rd</b>	<ol style="list-style-type: none"> <li>Revision of internal rules of stock compensation plan</li> </ol>
<b>4th</b>	<ol style="list-style-type: none"> <li>The amount of winter bonus for Operating Officers</li> </ol>
<b>5th</b>	<ol style="list-style-type: none"> <li>The amount of monthly compensation for Operating Officers</li> </ol>
<b>6th</b>	<ol style="list-style-type: none"> <li>Discussion on the amount of compensation for Officers</li> </ol>
<b>7th</b>	<ol style="list-style-type: none"> <li>The amount of monthly compensation for Operating Officers</li> </ol>

For details of officers' compensation, please refer to the securities report. (Japanese version only)  
<https://www.ntnglobal.com/en/csr/governance/structure.html>

### Compensation Committee

We made a transition from a Company with Board of Company Auditors to a Company with Nominating Committee, etc., and established the Compensation Committee. The Compensation Committee, the majority consists of Outside Officers, aims to improve fairness, transparency, and objectivity of procedures regarding the decision making of compensation for Directors and Executive Officers and enhance corporate governance. Also, the committee is charged with role of resolving the respective compensation particulars of Directors and Executive Officers.

- The policy and amount of compensation shall be discussed and decided at the Compensation Committee.
- Compensation system
  - Directors (excluding those who are concurrently serving as Executive Officers) shall receive only basic compensation, since they are in the position of supervising management (however, compensation for the chairman of the Board of Directors, the chairman of each committee, and members of each committee shall be paid separately).
  - The compensation of Executive Officers shall be composed of basic compensation, annual incentive (bonus), and medium- and long-term incentive (stock compensation). (The compensation for the authority of representation shall be paid separately).
- The appropriate level of basic compensation and the performance-linked ratio, etc. shall be set by job position by utilizing objective external research data on a regular basis.
- The payment amount of the annual incentive (bonus) shall be decided in consideration of the status of progress of measures for achieving key targets for each Executive Officer, on the basis of the performance level in the applicable fiscal year.
- Regarding the medium- and long-term incentive (stock compensation), the Company's shares shall be issued based on the achievement level of major target figures in the Medium-term Management Plan (money equivalent to the converted amount of shares shall be paid for a certain portion) as incentives to motivate them for achieving the targets in the Medium-term Management Plan and raising shareholder value, and in order to promote the holding of the Company's shares.
- The compensation level and composition shall be discussed at the Compensation Committee in a timely and appropriate manner.

# Information Disclosure

## Securing responsiveness to Corporate Governance Code

We take active measures to strengthen our corporate governance while securing responsiveness to the purport of the Corporate Governance Code, including the transition to a Company with Nominating Committee, etc. in June 2019. We have implemented all of the general principles of the Corporate

Governance Code. We will continue to work on strengthening our corporate governance while adapting to changes in our business environment.

 The "Corporate Governance Report" can be viewed on our website. (Japanese version only)  
<https://www.ntnglobal.com/en/csr/governance/structure.html>


## Cross-held shares

From the perspective of improving our corporate value over the medium- and long-term, we hold shares of other listed companies to maintain and strengthen stable and long-term business relationship. Regarding cross-held shares, we regularly verify whether or not a shareholding meets the holding purpose, in consideration of returns and risks including the trading status, dividends, and share price fluctuations. Holdings of stocks judged as not meeting the holding purpose will be reduced in number. We have verified the appropriateness of the holding of each stock held as of March 31, 2019, and confirmed that the holdings were appropriate for all stocks.

In principle, we exercise all voting rights of the cross-held shares. Regarding the voting for or against proposals, we make such judgments by paying due respect to the management policy of the company concerned, instead of simply applying fixed standards. We exercise voting rights by comprehensively taking into account "whether or not the holding will contribute to improvement of our corporate value in the medium- and long-term" and "whether or not the holding will damage shareholder value."

### Number of stocks and amount for balance sheet

	Number of stocks	Recorded amount (million yen)
Shares other than unlisted shares	50	33,951
Unlisted shares	26	290
Deemed shareholding	8	—

 The details of shares we hold can be viewed on our Securities Report (Japanese version only)  
<https://www.ntnglobal.com/en/csr/governance/structure.html>

## Information disclosure policy

We shall work to develop the Company and increase shareholder return, while at the same time communicating broadly with society, and advocating active information disclosure as one of its management policies. Moreover, we disclose information based on our Information Disclosure Policy and in compliance with various laws and regulations such as the Financial Instruments and Exchange Act and the "Rules on Timely Disclosure of Corporate Information by Issuers of Listed Securities" stipulated by the Tokyo Stock Exchange. We also respect the "Corporate Governance Code" and disclose information in a fair manner according to the "Fair Disclosure Rules."

We strive to disclose, as actively and fairly as possible, information that we deem useful for investors even if that information does not apply to laws, regulations and other rules.

## Management of material information

We appropriately manage information subject to insider trading regulations as well as conclusive financial information prior to disclosure, as material information. We also promptly disclose relevant material information if it is found that the Company's executive or other employee has conveyed material undisclosed information to a business contact determined in the Fair Disclosure Rule. However, when a certain piece of information is determined to be material but deemed inappropriate for disclosure, then we will not disclose the information, placing the concerned business contact under confidentiality obligation and obligation to not purchase/sell the Company's shares until such material information can be disclosed.

 Information Disclosure Policy can be viewed on our website.  
<https://www.ntnglobal.com/en/investors/disclosure.html>

## Accessible General Meeting of Shareholders

We try to make it as easy as possible for shareholders to attend the General Meeting of Shareholders, and take various other measures to ensure that shareholder voting is a smooth process.

### Earlier advance notice of the general meeting of shareholders

Three weeks' advance notice of the general meeting is provided (seven days earlier than the legally mandated deadline of two weeks before the meeting date).

### Website posting of general meeting notice

Our early disclosure efforts include providing notice of the General Meeting of Shareholders on our website one month before the meeting date. We also work to improve foreign shareholder convenience by providing an English translation (summarized) of the notice.

### Provision of detailed information in the general meeting notice

To assist shareholders' understanding, the officer appointment-related agenda items are accompanied by a list of candidates' names, photos of candidates, the attendance rate at the Board of Directors, years of service, and similar information.

### Selection of date of the general meeting of shareholders

To maximize shareholder attendance, traditionally busy dates are avoided, and account closing/auditing schedules are considered when setting the meeting date.

### Online voting

Advance voting is made possible both by post and online. For the convenience of institutional investors, NTN is also on the Electronic Voting Platform run by Investor Communications Japan (ICJ).

### Other

The Chairman's explanation at the General Meeting of Shareholders is supplemented by summaries of business reports and financial results presented on a screen with visual aids such as graphs and photos.

## ESG meeting

On December 25, 2018, we held an ESG meeting at our Tokyo office for the first time. We explained about NTN's ESG initiatives to the 15 institutional investor participants. In the meeting, in order for the investors to better understand our ESG initiatives, we used our integrated report "NTN Report 2018," which was issued last year, for the explanation, and also had a dialog about our tasks and requests from investors.



The first "ESG meeting"

## Status of inclusion in ESG indexes

We have been assessed as an active practitioner of ESG (Environment, Social and Governance) in the stock market, and our shares have been selected for inclusion in four ESG indexes for stock trading in consideration of environment, social, and governance factors, which Government Pension Investment Fund (GPIF) announced in July 2017 and September 2018. Our shares have also been selected for inclusion in multiple SRI (Socially Responsible Investing) funds and SRI indexes. We will continue to carry out proactive ESG initiatives and information disclosure.


### ESG indexes that GPIF adopted

			
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### SRI funds and SRI indexes

	
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\*1 Inclusion status as of the end of July 2019.  
 \*2 The inclusion of NTN Corporation in any MSCI index, and the use of MSCI logos, trademarks, service marks or index names herein, do not constitute a sponsorship, endorsement, or promotion of NTN Corporation by MSCI or any of its affiliates. The MSCI indexes are the exclusive property of MSCI. MSCI and the MSCI index names and logos are trademarks or service marks of MSCI or its affiliates.

 The details of each index can be viewed on our website.  
<https://www.ntnglobal.com/en/csr/sc/investor.html>

# Internal Control/Internal Audit

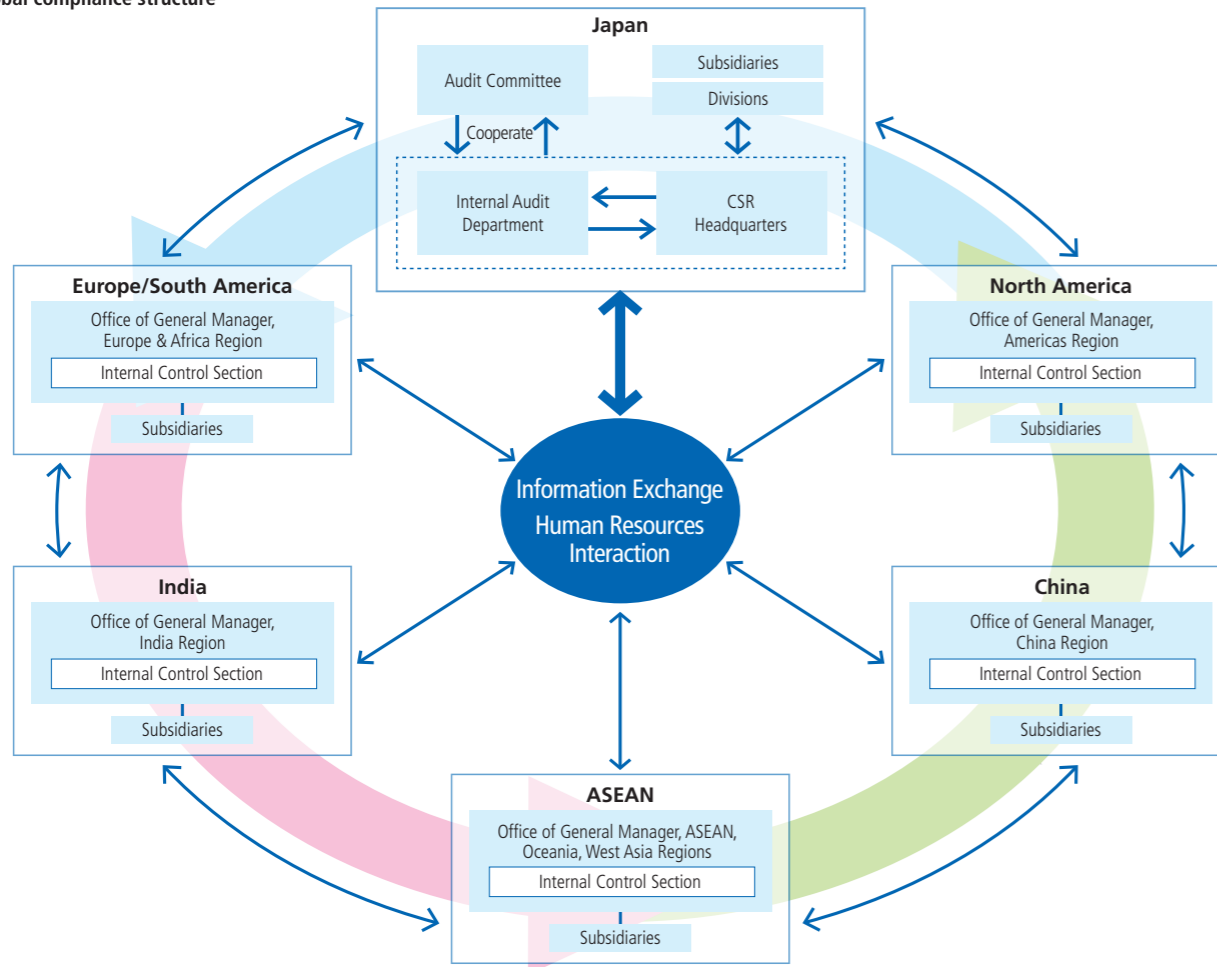
## Basic approach to internal control

We recognize risk management and compliance as one of our most important managerial issues, and stipulate the Internal Control Policy.

In addition, regarding the internal control under the Financial Instruments and Exchange Act, respective 49 domestic and overseas subsidiaries and the Internal Audit Department made an evaluation of internal control for the fiscal year ended March 31, 2019, in compliance with the basic framework for

internal control set forth in the Business Accounting Council's Standards and Practice Standards for Management Assessment and Audit concerning Internal Control Over Financial Reporting (Council Opinions). We will continuously develop the internal control and make an operational evaluation appropriately, in accordance with relevant standards, in response to changes in the business environment.

### Global compliance structure



## Internal audit activities

In our company, the Internal Audit Department is in charge of the internal audit operation and the overall management operation of the internal control system. The Internal Audit Department conducts an internal audit of the status of operational execution in each division of our group, from the viewpoint of compliance with applicable laws and regulations and the Company's internal rules, its appropriateness as well as effectiveness and efficiency of business activities, as an independent audit organization. Then, the Internal Audit Department gives advice and proposals for improvement on the basis of the result of the internal audit, confirms the implementation status of improvement measures, and conducts

a follow-up audit. It also reports on results of internal audit to President, and the Audit Committee as necessary.

Outside Japan, an Office of the General Manager has been established in each region to oversee and monitor operations, each having an Internal Control Section within it. The Internal Control Section works with the Internal Audit Department and CSR Headquarters to implement policies specific to the local region or country in accordance with local needs and characteristics.

The Internal Audit Department, Audit Committee, and Accounting Auditor work to improve efficiency and effectiveness of audit by regularly holding meetings and exchanging information and opinions about the policy, plans, and results of audit.

# Risk Management

## Basic approach to risk management

To guide our work on managing risks, we have developed the Risk Management Policy that outlines our basic approach to prevention and handling of risks that may hamper the execution of the Group's business, and the Risk Management Regulations that set forth risk management organizations and roles.

We convene the Risk Management Committee as an advisory body for risk management twice a year, to regularly

check the situation of risk surrounding the Group's business, including changes in domestic and overseas circumstances. We also formulate the groupwide risk management plan and discuss matters such as the promotion of BCP (Business Continuity Planning) and BCM (Business Continuity Management). The result of discussion at the Risk Management Committee are reported to the Board of Directors.

### Structure chart



## Promotion of global risk management

### Monitoring of management status of critical risks (nine global risks) per business site

To enable comprehensive worldwide risk management for the entire NTN Group, we selected nine risks as Global Risks that are common to both domestic and overseas subsidiaries and expected to cause major impacts on management if they occur.

The management status of nine risks of domestic and overseas subsidiaries is regularly monitored via our database, and we assess the status according to the common global standards we have developed. Based on the assessment results, we identify the groupwide status of management, and push ahead with necessary measures including support for development of the Company's internal rules.

The Risk Management Committee makes periodic revisions and checks for global risk selections in response to changes in the environment.

## Promotion of BCP/BCM

### Completion of formulation of BCP for early recovery at all domestic production sites

We have been developing the BCP/BCM structure designed to handle a major earthquake in Japan.

In the fiscal year ended March 31, 2019, we have completed the formulation of BCP to enable early disaster recovery at all domestic production sites which produce products for customers. Moreover, we have started providing BCP training to assess the effectiveness of the formulated action plans at business sites where BCP formulation has been completed. At the same time, we are promoting the development of BCM (the training was performed in five business sites in the fiscal year ended March 31, 2019).

In the fiscal year ending March 31, 2020, while continuing with BCP training, we will also put our efforts into formulating BCP as a part of supply chain management, for business sites that produce products shipped to the Group (in-house processed products) and each logistics unit.

### Global risks

1. Leakage of confidential information
2. Computer virus/cyberterrorism
3. Violation of antimonopoly laws
4. Natural disaster
5. Fire disaster/explosion
6. Issue of human rights
7. Industrial accident
8. Complaint about product quality
9. Violation of bribery-related laws



BCP training

# Compliance

## Basic approach to compliance

We position the enforcement of compliance as one of our most important managerial issues because we believe that earning the trust of society is essential for us to contribute to the realization of sustainable society and continue to be a company needed by society. We formulated the Business Code of Conduct to specify the policy of actions which officers and employees should

observe to conduct business activities in accordance with laws and regulations and generally accepted standards and practices in each country, and our internal rules. We also develop and operate the compliance promotion structure including rules relating to compliance, a whistle-blower system, the Compliance Committee, and the Fair Trade Monitoring Committee.

## Compliance promotion structure

We have in place the Compliance Committee and the Fair Trade Monitoring Committee.

The Compliance Committee handles the global compliance risks excluding those relating to Antimonopoly Act and Subcontracting Act. The committee members propose and implement policies for risk mitigation, in collaboration with compliance promotion activities supervisor who is appointed at each domestic business unit, and the Internal Control Section which is established at each Office of the General Manager in five overseas regions. The details of these activities are reported to the Board of Directors.

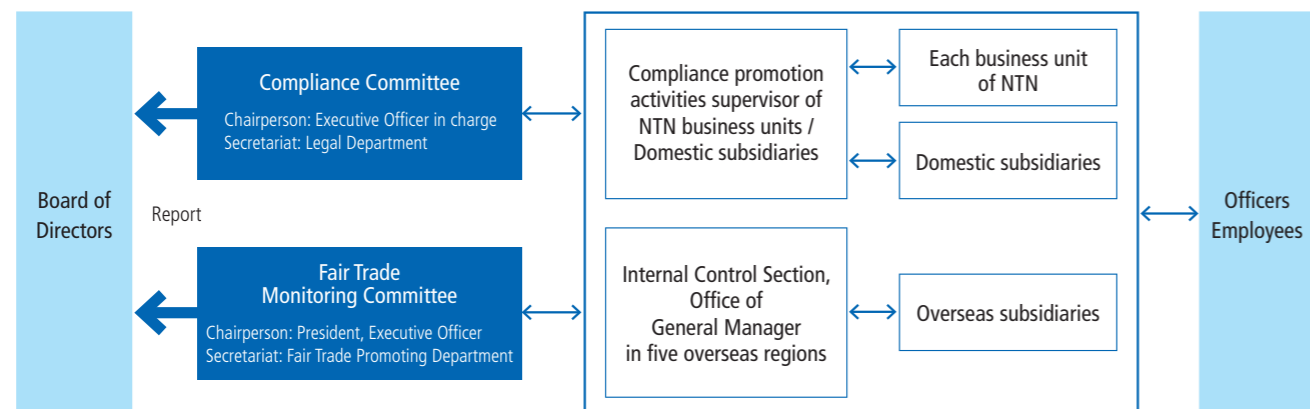
The Fair Trade Monitoring Committee, chaired by President, Executive Officer, discusses implementation plans and reports of antimonopoly and Subcontracting Act compliance activities. Additionally, we established the Fair Trade Promoting Department in CSR Headquarters as an overall management department for the antimonopoly compliance. Under the direction of the Fair Trade Monitoring Committee, the Fair Trade Promoting Department conducts education, instruction, audit and other activities for relevant divisions. Additionally, overseas subsidiaries are monitored for the implementation status of antimonopoly compliance in cooperation with the Internal Control Section, within Office of the General Manager in each region.

Also, the Legal Department works to enhance the promotion activities in each business unit by holding the mass training meeting for compliance promotion activities supervisors once a year, and sharing information and exchanging opinions on important issues. Furthermore, we hold the CSR Global Meeting in which persons in charge of compliance in domestic relevant divisions, mainly within the CSR Headquarters, and persons in charge of compliance in overseas regions participate. In the meeting, participants exchange information about compliance promotion activities to define new issues and mutually confirm the policy of activities.

## Major actions to enhance compliance

Category	Actions	Commencement (YYYY/MM)
Development of Structures/ Policies/Rules	Rules for management of compliance promotion activities are established	2015/04
	Compliance Committee is held (four times a year)	2015/04
	"NTN CSR Procurement Guidelines" for business partners, including compliance contents are issued	2016/04
	July 26 as "Compliance Day" is designated and President message is delivered to all NTN Group employees (once a year)	2016/07
Education/ Awareness-raising activities	Topic-specific training for important departments which especially need to be familiar with compliance by Legal Dept, Fair Trade Promoting Dept and Etc. (as needed)	2012/01
	Compliance training for Operating Officers is implemented (as needed)	2012/08
	Rank-based compliance training for new managers, new employees, Etc. by Legal Dept (as needed)	2015/04
	Original compliance training for each business unit by compliance promotion activities supervisors is implemented (as needed)	2015/04
	Mass training meeting for compliance promotion activities supervisors, and persons in charge by Legal Dept is implemented (once a year)	2015/04
	NTN's Compliance, which is a database for sharing compliance related information, such as compliance-related incidents and introduction of compliance promotion structure is operated	2016/08
	E-learning program about corruption prevention and antimonopoly laws is implemented (once a year)	2017/04
Audit/ Monitoring activities	Audits on antimonopoly compliance are implemented	2012/11
	Audits on rules for corruption prevention are implemented	2018/05

## Structure



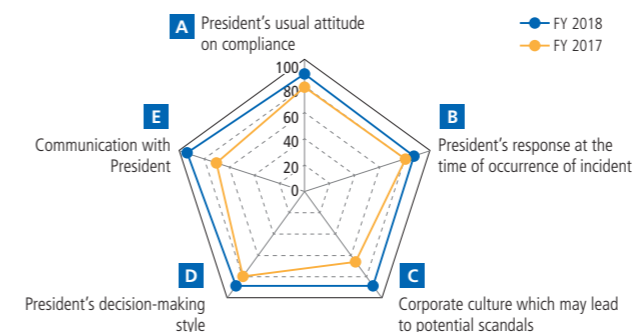
## Survey of "Compliance awareness"

From the fiscal year ended March 31, 2018, as a part of activities to prevent misconduct, we started a compliance awareness survey for employees of subsidiaries to evaluate the stance of the president of each subsidiary on compliance.

In the fiscal year ended March 31, 2019, we conducted the survey for 2,100 employees in 48 domestic and overseas subsidiaries (an increase of 600 employees and two subsidiaries from the previous year). Also, we performed the compliance survey for 1,300 employees in the manufacturing divisions of NTN Corporation, regarding the stance of each general manager of works and divisions.

Presidents and general managers who are subject to the survey are informed of the survey results so that they become aware of the fact that they are always monitored in the company, leading to create a corporate culture that does not tolerate any act of misconduct.

We also utilize these survey results of internal audit, and will continuously conduct these survey of prevent misconduct.



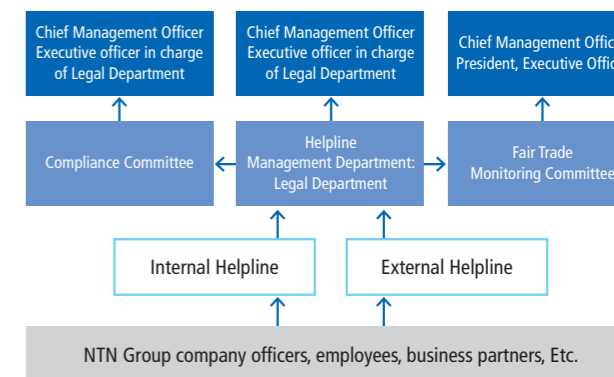
## Corruption prevention initiatives

We enforce in-house regulations created to reflect domestic and overseas anti-corruption laws and generally accepted standards and practices. In our in-house rules and regulations, they not only prohibit bribery from/to domestic and overseas public officials and business partners, but also specify the rules and procedures regarding provision of property or profit by our officers or employees, and the rules and procedures to prevent bribery via our business partners. In various countries, regulations against bribery have been increasingly tightened and some countries even impose restraints on the transfer of property or profit between private companies. Under these circumstances, in order to thoroughly ensure fair trade and prevent officers and employees from giving rise to conflict of interest situations, we have established the rules and procedures regarding receipt of property or profit, and make it a policy to decline the provision of entertainment and gifts from our business partners that exceed the bounds of common sense. We develop a structure to prevent bribery by implementing awareness-raising activities, including internal training and e-learning program as well as conducting self-audit regarding rules for prevention of bribery once a year. Our domestic subsidiaries also develop and operate their own regulations while maintaining consistency with our company policies.

Our overseas subsidiaries have developed in-house rules and regulations localized to reflect overseas relevant laws and regulations and generally accepted standards and practices in each country, and started to enforce such rules and regulations in stages. On top of that, we have worked to audit the operational status of rules and regulations and internal procedures in each region.

## Helpline (whistle-blower system) and educational activities

The whistle-blower system called Helpline is established in domestic business units with both in-house and outside contact points. Employees can use the system to voice various concerns related to infractions of laws, Business Code of Conduct, or in-house regulations. Issues raised through contact points will be investigated in accordance with Helpline Management Rules. Through the introduction in various types of compliance training, the Business Code of Conduct guidebook, and intranet, we have developed a structure where all employees can openly utilize the Helpline not only as a means of reporting of misconduct, but also as a means of raising questions, opinions, and complaints about the observance of the Business Code of Conduct, and maintaining satisfactory relationship between the Company, officers, employees, and business partners. Whistle-blower systems are being progressively created and operated also in overseas regions, where they are tailored to local needs and circumstances.



## Antimonopoly compliance initiatives

We regard any antimonopoly violations represent a potential risk for the whole NTN Group. In order to ensure thorough antimonopoly compliance, the Fair Trade Promoting Department and the Internal Control Section in each region regularly conduct trainings on antimonopoly compliance, which are tailored to local laws and environment.

In the fiscal year ended March 31, 2019, our main awareness-raising activities included the training for managers at mainly sales department (378 participants), the rank-based training for new managers and new employees (197 participants), and the new training for operating officers mainly concerning the prevention of cartel formations, where we invited an external lawyer as a lecturer.

We work to put fair and free competition into practice by continuing to upgrade our training activities and raising the awareness of officers and employees.

# CSR Management

## Basic approach to CSR

We have established the CSR policy in the spirit of our corporate philosophy. We define CSR as:

- Engaging in corporate activities that incorporate concern for the environment and initiatives to ensure social fairness and contribution to the community
- Fulfilling the duty of accountability to stakeholders
- Working to improve corporate activities not only in the economic aspect, but also in the environmental and social aspect.

In 2014, we established the CSR Headquarters to

strengthen our groupwide CSR activities. Also, in May 2018, CSR Headquarters was re-organized and comprises four departments: Global Risk Management Department (handling risk management), Legal Department (handling compliance), Fair Trade Promoting Department (handling Antimonopoly Act), and Corporate Value Promotion Department (handling activities designed to help improve corporate value). Managers and staff in charge of CSR are appointed at domestic and overseas subsidiaries to plan and perform activities tailored to local needs and characteristics.

## UN Global Compact

We endorsed the United Nations Global Compact (an international initiative for developing a global framework for sustainable worldwide growth) in 2015. Under the UN Global Compact, we support ten principles in the four areas of human rights, labour, environment, and anti-corruption. We also proactively participate in the Kansai subcommittee, which is established by the UN Global Compact, as a facilitator to realize sustainable society through business activities.



## TOPICS 5th Stakeholder Dialog

To incorporate stakeholders' input into our sustainable corporate activities, we have annually held our Stakeholder Dialog since 2015 with academics and experts representing a number of CSR-related fields. The 5th dialog was held in June 2019, and provided some valuable input.

In the 5th Stakeholder Dialog, we mainly discussed about four topics (CSR management, environment, human rights, and governance).

Currently, initiatives to realize sustainable society (e.g. SDGs, ESG) have been widely promoted in the world. We learned from the experts' dialog that it is important for NTN to tackle new businesses from a creative and strategic viewpoint with awareness of social challenges, and aim to connect existing businesses with solutions for social challenges, in order to further realize smooth society through our business activities.

### Experts



**Katsuhiko Kokubu**  
Professor, Graduate School of Business Administration Kobe University



**Masaru Kaizaki**  
General Manager of Planning Department, Sustainability Office OMRON Corporation



**Hideki Matsuoka**  
Special Project Manager, Asia-Pacific Human Rights Information Center (HURIGHTS OSAKA)



**Eriko Nashioka (Facilitator)**  
Representative Director of Institute for Environmental Management Accounting, CPA

### NTN

- Senior Managing Executive Officer in charge of CSR Headquarters ..... **Itsuji Goto**
- Adviser ..... **Hiroshi Nakano**
- Manager of EHS (Environment, Health and Safety) Integrated Management Department ..... **Kenji Nono**
- Deputy Manager of EHS (Environment, Health and Safety) Integrated Management Department ..... **Masayuki Yamazaki**
- Manager of Personnel Department ..... **Toshiyuki Kawaguchi**
- Manager of Corporate Value Promotion Department ..... **Kouhei Iguchi**

### TOPIC 1

#### CSR management

The essence of "responsibility" ("R" in CSR) is to be a company needed by society. In this sense, it is vital for a company to present its contribution to society in an easy-to-understand way to stakeholders. NTN Report 2018 describes this in the Value Creation Process section, which can be highly evaluated. In the next step, it is important to show in more detail how the company generates social value ("smooth society") as well as economic value. For this purpose, we must perceive activities in each business area cross-sectionally as a process to create value.

At OMRON, TOGA (The OMRON Global Award) was started in 2012 as an initiative to further put its corporate philosophy into practice. The number of participants has grown over the years, and more than 60,000 employees joined the event in 2018. The source of this continuous development is the corporate culture where the management encourages employees to take on challenges, which leads to the gradual increase of participants who agree to the purpose of the event, which results in many employees realizing the significance of solving social challenges. This year, NTN PROUD AWARD will be held for the second time. Based on the example of OMRON which shows that continuation leads to transformation, we hope that the significance of this initiative will take a firm hold in NTN to enable the event to continue.

### TOPIC 2

#### Environment

A company that proactively works on environmental management shows its long-term vision with target figures (e.g. zero CO<sub>2</sub> emissions by 2050), specifies the target by backcasting, and analyzes the concrete measures to realize the target. Through such approach, the whole group can work on the reduction of CO<sub>2</sub> on the basis of the common standard over the medium- and long-term. NTN therefore should also consider the adoption of such approach when setting the environmental targets.

It is good that NTN discloses how much its environmentally friendly products contribute to the environment. However, expressing the reduction of emission as "contribution" can be misleading since there still is some level of emission when seen globally as a total volume. So, regarding the method of disclosure, it might be better to mention that NTN products are helpful as a means of reducing the total volume of emission.

### TOPIC 3

#### Human rights

Following the global focus on ESG investment, many companies have rapidly started initiatives on "business and human rights" in the recent two or three years. Development of basic policy on human rights on the basis of corporate philosophy, rather than human rights

alone, makes it easier to share the policy globally among the whole group. It is important for NTN to clarify its positioning and connection among the corporate philosophy, NTN SPIRIT, and the basic policy, in formulating the basic policy on human rights.

### TOPIC 4

#### Governance

We can see from the Outside Director Dialog, which is contained in NTN Report 2018, that Outside Directors' opinions are actively voiced in NTN. The recent transition to a Company with Nominating Committee, etc., which is said to have the strongest management oversight function, means that Outside Directors have a stronger voice and their opinions are more widely reflected, resulting in enhanced corporate governance.



Useful exchange of opinions with experts

TOPICS

# Enhancement of corporate value

## NTN SPIRIT as a behavioral guideline for all employees of the Group

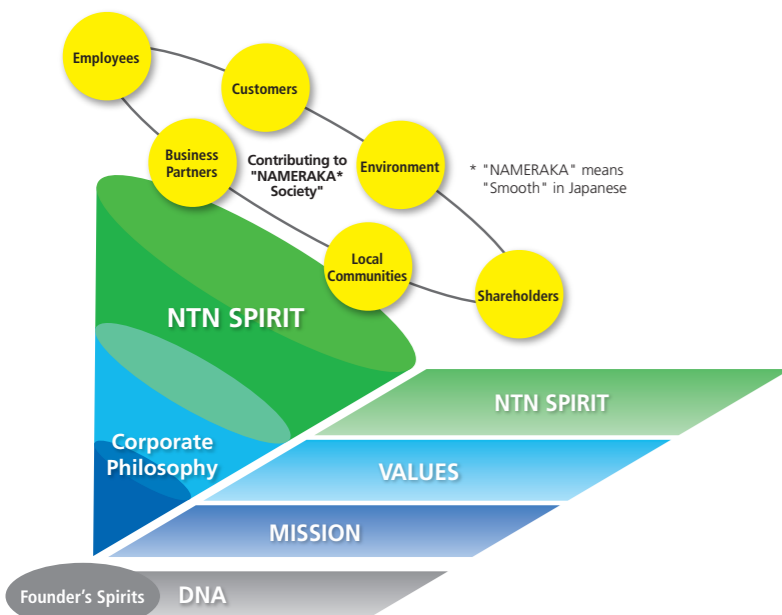
In April 2018, we established the corporate philosophy code of conduct, NTN SPIRIT, with the aim of raising awareness of the corporate philosophy. The NTN SPIRIT stipulates the mindset and actions which each NTN Group employee should aim for.

The NTN SPIRIT is not just a motto to be read out, but our common language for all NTN Group employees to practice. We promote measures for practice by taking three steps of Recognition, Empathy & Understanding, and Practice.

### Corporate Philosophy

**We shall contribute to international society through creating new technologies and developing new products.**

#### Corporate Philosophy System



### Recognition

#### Issuance of NTN SPIRIT BOOK

The NTN SPIRIT BOOK was issued to raise all NTN Group employees' awareness of the framework of our corporate philosophy and the corporate philosophy code of conduct, NTN SPIRIT. This book encourages each employee to practice our corporate philosophy with his/her dream and goals to realize a smooth society. Also, we issued posters to promote awareness-raising activities in each business unit.

#### NTN SPIRIT BOOK

The illustration of the NTN SPIRIT BOOK was drawn by Ms. Masumi Yamauchi, who drew the illustration of the book called "If the World Were a Village of 100 People." The picture book depicts how people live in a smooth world. We hope that this book will contribute to the cultivation of employees' awareness and pride as a member of NTN as well as cultivation of empathy, through our initiatives and the image of happy lives.



The picture book explains about the NTN SPIRIT in an easy-to-understand way.

#### Three Steps for Practice



Our three steps are Recognition, Empathy & Understanding, and Practice. Based on the Recognition, we continuously repeat steps of Empathy & Understanding and Practice.

### Empathy & Understanding

#### Corporate Philosophy Dialog

Since 2017, we have held the Corporate Philosophy Dialog so that each employee will deepen their empathy and understanding for the corporate philosophy framework and the NTN SPIRIT, adopt them into each employee's operation, and disseminate the idea in each office. Since the establishment of the NTN SPIRIT, we held the dialog for officers (in August 2018) and overseas executives (in October 2018). Also, the dialog was held for general managers of domestic divisions (from November 2018 to March 2019) at each business site.



Corporate Philosophy Dialog for officers



Corporate Philosophy Dialog for general managers of divisions

### Practice

#### NTN PROUD AWARD

The NTN PROUD AWARD has been held to encourage all NTN Group employees to "take on challenges for transformation." Four categories corresponding to basic values of corporate philosophy (the Field of Creation, Field of Service Solution, Field of Contribution to the Society, and Field of Globalization) are set and employees are encouraged to set topics and targets which link the corporate philosophy to their daily operations and to work to achieve them. The process and results of those activities are assessed in accordance with three credos of NTN SPIRIT, namely, Challenge, Collaboration, and Commitment. In 2018, 1,711 employees (164 teams) from domestic and overseas business sites participated in this event, and worked to put the corporate philosophy into practice through activities to achieve the targets. In 2019, NTN PROUD AWARD 2 is held as "an opportunity to practice our corporate philosophy," and each team is working to achieve its goals.



Opening of NTN PROUD AWARD



Employees who participated in the NTN PROUD AWARD

# Human Resources

Development and effective use of human resources

## Basic approach to human resources development

We believe that each employee's growth is namely the growth of the Company, and the NTN corporate philosophy can't be achieved without each employee's growth. Based on this idea, we are working on human resources development.

Our ideal human resources are those who are creative, self-supporting, and global. We aim for sustainable growth by encouraging each employee to become a person who think and act for themselves.

In addition, to make an innovational shift from a "Manufacturing Company" with a history of 100 years to "a Company that Delivers Value to Customers through Products and Services," while encouraging each employee to acquire more specialized skills, we are also working to expand specialized areas to take on challenges for new areas by constructing necessary information from several fields to solve various social challenges.

Human resources are the basis of corporate development. We aim for early development of innovative human resources who can continuously produce excellent results, and we especially work on improvement of skills to "spontaneously set ambitious targets, and achieve it by clarification of issues to be solved," "exert his/her originality and ingenuity for targets, with belief in achievement of targets," and "make people around him/her to be eager to cooperate," for the purpose of meeting customers' needs and contributing to sustainable society by creating original and unique technology.

## Rank-based human resources development

We develop human resources development program for employees of all ranks to encourage them to become persons who think and act for themselves for the purpose of improvement of operational execution capability and acquisition of knowledge, methods, way of thinking which are necessary to respond to skills requirement in accordance with employees' ranks which are classified by age and qualification, etc.

The development of human resources who can play an active role not only domestically but also globally is essential to expand businesses for the next 100 years. To develop such human resources, we have enhanced the overseas experience program especially for the young employees. As human resources development programs for those who will take overseas assignment in the future, we have the International Trainee System, which is a one-year program aimed at improving language skills and operational skills by OJT at overseas business sites, and the International Challenge Training, in which newly graduated employees are dispatched to overseas business sites for three months for early development of language skills and skills to play an active role in a different culture. We also utilize the Overseas Study/Scholarship System to stimulate employees' passion for learning, and develop excellent, global human resources.

## Human resources development by specialty focusing on technical skills and technology

We promote development of human resources who can hand our proprietary technologies and technical skills down from our mother plant to worldwide manufacturing bases.



## Human resources development for specialized in quality

To improve employees' quality awareness, we provided a specialized quality education program to 127 employees during the fiscal year ended March 31, 2019, including topics such as "QC Basic Course" and "QC Advanced Course." In our training, we provide quality education programs which renew the employees' awareness of the importance of quality by using educational materials showing past quality defects and cases of complaints.

In addition, a quality education program aiming for design development that prevents malfunctioning is provided for design and technology divisions.

## Global QC Circle Convention and NTN Technical Skills Competition: Enhancement of skills and capability at global business sites

The Global QC Circle Convention and NTN Technical Skills Competition are annually held at Mie Prefecture where the Company was established.

The Global QC Circle Convention is designed to help improve worldwide safety, quality, and productivity as well as provide an opportunity for international interaction where information regarding various activities can be exchanged.

In the NTN Technical Skills Competition, employees compete with each other in demonstrating their skills developed in daily training, while using this opportunity to hand their proprietary technology down to the next generation by interacting with superior young technicians.



## NTN production engineer training course: Strengthen mother functions

We had established NTN School to provide training for production engineer specialists who can take an active role globally, but we changed its name to NTN production engineer training course in the fiscal year ended March 31, 2018 to renew it to a more highly specialized course. This course provides new employees aiming to become production engineers with a three-year education program covering from basic manufacturing to specialized production engineering education, for the purpose of early



An employee taking an active role in an overseas manufacturing site

development and turning out of production engineers who can take an active role as leaders to strengthen domestic mother functions.

Diversity

## Approach to diversity

The economic condition and social structure surrounding us have drastically and rapidly changed, including the shrinkage of labor force and the development of globalization.

We are working on transformation for sustainable growth, and one of the important strategies toward this transformation is promotion of diversity.

Fusion of various values and generation of flexible ideas, regardless of sex, nationality, culture, age, presence of a disability, lead to transformation. We will accelerate transformation by working to develop a workplace environment where each employee can take pride in the Company, find his/her work rewarding, and fully demonstrate his/her ability.

We will realize our corporate philosophy, "We shall contribute to international society through creating new technologies and developing new products" by promoting various diversity-related measures.

## Expansion of employment of elderly employees

Under the circumstances of decreasing birthrate and aging population in Japan, we are working to encourage experienced employees to take an active role as important workers. We develop an environment where experienced employees can continue to work after the retirement age of 60 by making use of their career experience, to hand their knowledge, technology, and technical skills down to the next generation.

In comprehensive consideration of their career experience, skills, workplaces, etc. to date, they can continue to work at any of domestic subsidiaries. Such structure resulted in 90% rehiring rate for those who reached the retirement age in the fiscal year ended March 31, 2019.

## Balancing work and childcare

We developed a handbook about childcare leave and relevant systems for those who take childcare leave, and their boss to support the balancing of work and childcare. The creation of a handbook for both those who take childcare leave and their boss will result in an environment where employees who are planning to take childcare leave get more support from the workplace. In addition, in order to ensure smooth reinstatement, those who take childcare leave can contact the workplace and get various application forms at their own timing by utilizing communication tools. Also, we encourage male employees to take childcare leave. We work on awareness-raising activities by posting in the office posters of "IkuMEN Project (a project to encourage male employees to take childcare leave)" which is promoted by Ministry of Health, Labour and Welfare. Moreover, we post on the intranet interviews with male employees who took childcare leave, thereby encouraging other male employees to take childcare leave.

## Encouraging women in the workplace

We hold various training programs for women to encourage them to take a further active role. The Women Encouragement Seminar is held to help and encourage women to consider their career enhancement, especially for women who work in a workplace with few women.

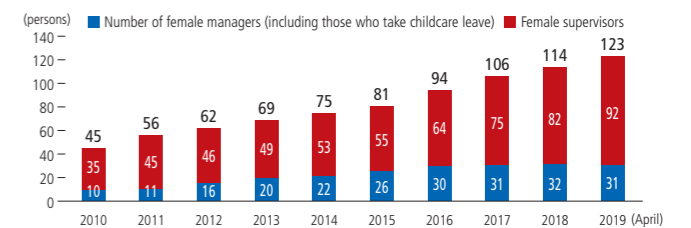


Women Encouragement Seminar

In addition to that, we promote information exchange with universities and organizations which support women's career enhancement to develop female researchers and engineers. We have also participated in the collaborative meeting for gender equality promotion at Osaka which is held by the National University Corporation Osaka University. We have supported Science Girls Festival!! held by Osaka University to increase and develop future female researchers and engineers, and introduced our corporate initiatives to support women's career enhancement to female junior high and high school students and their parents.

Though the number of female managers has remained almost flat, the number of female supervisors who are candidates for the next managers has gradually increased, so we expect that more women will take a further active role.

Trend of female managers and supervisors at NTN (employees on NTN enrolled)



## Promotion of employment of persons with disabilities

Regarding the employment of persons with disabilities, we have established three "Dream Workshops" at Kuwana, Iwata and Okayama Works. This initiative, implemented in cooperation with special needs schools, provides a work environment in which persons with intellectual disabilities can fill an important role. Also, we have worked on developing a workplace environment where employees in wheelchairs can work comfortably by promoting barrier-free environment in the workplace.

We aim to create a workplace where various types of employees can display their unique ability in a range of work sites (e.g. manufacturing site, management department, etc.). Many employees are also taking an active role in specialized operations.



Employees with intellectual disabilities working at the Dream Workshop

## Human Resources

### Work style reform

#### Promotion of work style reform

We have promoted a work style reform which enables all employees to find their work rewarding, fulfill operational responsibilities, and comfortably lead their lives in society with harmony and peace of mind. We thoroughly manage working hours and introduce no overtime day, flextime, and interval system to enable each employee to work efficiently. In addition, we have also worked on the reform of personnel systems, such as introducing systems responding to various types of career paths and life events (e.g. childcare, long-term care), to provide opportunities for many employees to take an active role.

#### Realize diverse work styles

##### Start of telecommuting system

Since we believe it is important to offer more work style options by making working hours and locations more flexible for various employees to take an active role in the workplace, we implemented the telecommuting system on a trial basis in stages from the fiscal year ended March 31, 2017. After identifying issues and taking improvement measures, we started the system in April 2019. We aim to further utilize the telecommuting system in the future, because the system will lead to heightened focus on performance, a work style with better quality, and enable the balancing of work and childcare/long-term care.

##### NTN Job Return Scheme

A rehiring system for employees who left their jobs due to life events. The conventional Mom-back System was only for those who left their jobs due to marriage, childbirth, or childcare, but we renewed the system to NTN Job Return Scheme in April 2018, enabling those who left their jobs due to long-term care to use this system. Furthermore, those who left their jobs due to studying abroad, job change, spouse's job relocation, also became applicable to the system. Through this approach, we promote work-life balance as well as the development of an environment where former employees can make the most of their experience, knowledge, and expertise acquired in the company or other companies after leaving our company.

##### Enhanced lineup of employee leave programs

We provide maternity, childcare, and long-term care leave programs which are well developed beyond the legally mandated standards. Such approach leads to the system which allows many employees to continue their careers without suspension.

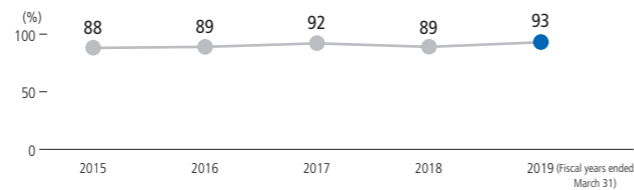
For example, the system of shortened working hours for childcare expands its scope to those who raise children who are in the third grade of elementary school or younger, and introduces staggered working hours due to childcare in Tokyo and Osaka. Such initiatives are far beyond the legally mandated standards.

We are not only working to develop such system, but also putting our heart into making the system become vitalized and convenient for employees. We are also trying to create an office culture where employees can make full use of the system.

#### High rate of taking annual paid leave

Our initiative to promote the taking of annual paid leave has started in the 1980s. Under the original keywords of "comfort and prosperity," we have worked on the realization of work-life balance. We have maintained a high average utilization rate of annual paid leave, exceeding over 80% for over 25 years. Now we are aiming at a higher level, working to develop multi-skilled employees, conduct proactive job rotation, and cultivate a workplace atmosphere which encourages employees to take annual paid leave.

Trend of annual paid leave utilization rate



#### Introduction of RPA

We are working on productivity enhancement of indirect divisions through work style reform. Recently, the decreasing birthrate and aging population in Japan, and the consequent shrinkage of working-age population have been considered as issues. Under such circumstances, it is essential to develop a corporate structure which enables us to expand our business without increasing employees, in order to grow sustainably going forward. We, therefore, have promoted automation and improvement of efficiency by utilizing RPA (Robotic Process Automation) for routine and repeated operations in indirect divisions (e.g. head office, sales, technology, research, etc.). We aim to shorten the development period of new products by using RPA for routine operations, and allocating more human resources to high-value-added operations.

In the case of product design operations where RPA has been already introduced and utilized, the process from calculation of design to drawing up has been automated. As a result, the monthly operating hours for some cases decreased by approximately 73% to 20 hours. We intend to increase the number of applicable divisions in the future, and work to further improve the awareness and corporate culture to encourage each employee to spontaneously think and promote the automation and improvement of efficiency of his/her operation.

#### Selected as "Best Practice Company" by Osaka Labour Bureau, Ministry of Health, Labour and Welfare

We were selected as "Best Practice Company," which works on proactive initiatives for work style reform, by Osaka Labour Bureau, Ministry of Health, Labour and Welfare. We were highly evaluated for exceeding 80% of annual paid leave utilization rate for over 25 years, and initiatives for productivity enhancement and reduction of long working hours by utilizing RPA. We will continuously work on the work style reform to respond to diversified values and lifestyles proactively.



Exchange of views on work style reform with Director of Osaka Labour Bureau

## Safety and Health

### Basic approach to occupational safety and health

Based on the humanistic spirit of the "safety first" approach, we ensure safety and health in the workplace, and promote the development of the workplace environment where employees can work comfortably while keeping their health for the purpose of promotion of safer and better production. To that end, the Company and employees have been deepening mutual understanding and trust, applying our wisdom and passion, cooperating with each other, and making unremitting efforts to realize these goals.

### Development of framework supporting safety

#### Establishment of EHS (Environment, Health and Safety) Integrated Management Department

We established the EHS (Environment, Health and Safety) Integrated Management Department on October 1, 2018.

We will further strengthen management of environment and occupational safety and health, and improve effectiveness of the NTN Group, by promoting integrated management of the environment, health and safety that have attracted growing global interest.

#### Safety management structure that meets global standards

We work on initiatives for the workplace with no occupational accidents at all global production bases.

We promote development of the workplace with no occupational accidents, under the global safety management structure where the President serves as chief director, the officer in charge as manager of corporate safety and health, and corporate general manager of each headquarter in Japan and general manager of each overseas region as management managers.

In case of an occupational accident, information will be shared via the system developed in our group within 24 hours regarding domestic occupational accident, and 48 hours regarding overseas occupational accident, in principle. In the case of a critical accident or other occupational accidents judged by the EHS Integrated Management Department to require the convening of a global safety and health meeting with each region, we discuss and standardize countermeasures in the meeting.

### Personnel training to improve safety

In our training, we promote education not only to instruct employees to conduct appropriate operations according to direction, but also to encourage them to be able to think and act for themselves. Specifically, we utilize actual machines and virtual hazard simulators and provide safety education to mainly young employees and less-experienced employees.

We are active in providing hazard prediction training for our employees to be more sensitive to danger. Additionally, we have introduced the program to assess each employee's danger sensitivity and degree of daring to risk taking (survey of behavioral characteristic of safety issues), and utilized it as a communication tool between employees and their bosses.



### Development of machines in pursuit of fundamental safety

Regarding dangerous places discovered by safety patrol, HHT-K\*, and safety model men activities, we conduct risk assessment and take safety measures.

In the risk assessment, we estimate risk in each item of "a degree of injury," "possibility of occurrence," and "frequency of approach to risk," and set priority for risk mitigation measures. Regarding risk mitigation measures, we discuss fundamental measures (abolition or change of dangerous operations, etc.), engineering measures (installation of covers or interlock, etc.), administrative measures (preparation of procedure manuals, etc.), and use of protection tools, in this order. Also, we clearly stipulate residual risk on sticky labels on facilities, and thoroughly manage them.

\*HHT-K stands for Hiyari HaTo Kigakari, meaning close-call incidents and concerns

### Acquisition of Certification of Occupational Safety and Health Management System (ISO45001 / JIS Q 45100\*)

To realize safety and health of all employees working at the Company, we have proceeded with a shift of certification from the conventional Occupational Safety and Health Management System (OSHMS) to JIS Q 45100.

At the Kuwana Works, we have acquired the first JIS Q 45100 certification in this industry, and completed acquisition of certification for major domestic business units by June 2019. We continuously promote improvement of safety and health standards by observance of laws and regulations and further risk mitigation by P (Plan), D (Do), C (Check), and A (Action).

JIS Q 45100\*: JIS Q 45100 is a standard that includes, as requirements, Japanese safety and health activities which are daily implemented in the workplace such as 4S activities (seiri (sorting), seiton (set in order), seiso (shining), and seiketsu (standardizing)) and risk prediction activities, and initiatives to ensure employees' health, which have recently attracted growing interest, in addition to ISO 45001, the international standard for occupational safety and health management.

### Approach to health management\*

In view of the fact that proactive efforts to maintain and promote the health of employees are an important management factor that may affect the sustainable growth of the Company, we promote various measures to realize the workplace environment where each employee can display his/her ability to the utmost and work comfortably, in cooperation with the health insurance association.

#### Enhancement of atmosphere workplace

- Promotion of work-life balance, and prevention of long working hours
- Further vitalization of communication in the workplace
- Initiatives to promote balancing work and treatment of disease

#### Enhancement of mental health

- Improvement of workforce environment based on the results of stress check
- Prevention of mental illness by self-care and employee care overseen by the line manager
- Enhancement of mental health consultation system

#### Enhancement of physical health

- Appropriate health guidance and improvement of lifestyle based on the results of medical checkup
- Steady implementation of data health plan in cooperation with health insurance association
- Improvement of the participation rate of medical checkup for employee's spouse

\* Health management is a registered trademark of the NPO Health Management Research Association.





# Procurement

## Basic approach to procurement activities

We conduct procurement activities under the Basic Procurement Policy which clarifies our direction with the concept of: Globalization, Fairness/Impartiality and Environmental Preservation. These principles are intended to build up relationships of trust with business partners and procurement divisions of headquarters, as well as its related departments.

We work to conserve the environment through our activities as defined in the NTN Group Green Procurement Standards, giving priority to our business partners with outstanding performance for environmental conservation and environmental quality. We also encourage our partners to take proactive CSR actions positively and proclaim that in the NTN CSR Procurement Guidelines. Our domestic and overseas production bases work to ensure that supplies are procured locally or from the optimal locations.

## Revision of Green Procurement Standards

The NTN Group established the Green Procurement Standards and has been striving to conserve the environment and improve environmental performance of our products together with business partners who provide us with raw materials, parts and other materials.

In the fiscal year ended March 31, 2019, we revised the Green Procurement Standards, and promoted the compliance with environmental laws and regulations and improvement of environmental performance throughout the entire supply chain. As to the compliance with laws and regulations, we added phthalate esters, which will be subject to regulations under the revised EU RoHS2, to the list of prohibited substances in parts and materials purchased by us, and clarified compliance obligations such as the submission of the non-inclusion certification of NTN-prohibited substances. For the improvement of environmental performance of our business partners, we added more requirements to our suppliers such as providing a report on the amount of their CO<sub>2</sub> emissions when requested by NTN, and promoting water risk management demanded by climate changes which is becoming increasingly serious globally.

We briefed our business partners on the revisions at the supplier meeting, and asked for their understanding of our green procurement policy and submission of necessary documents such as the non-inclusion certification of NTN-prohibited substances.

For the latest version of the Green Procurement Standards, please visit our website.  
<https://www.ntnglobal.com/en/csr/sc/client.html>

## NTN CSR Procurement Guidelines

In April 2016, we established the NTN CSR Procurement Guidelines for the purpose of promoting activities throughout the entire supply chain for social issues such as human rights, labor practices, the environment, elimination of anti-social forces and anti-corruption. These guidelines establish 28 topics related to compliance, anti-corruption, human rights and labor, the environment, quality and safety, information security, business continuity management and social contributions, and we request our suppliers to further promote their CSR procurement activities.

For the NTN CSR Procurement Guidelines, please visit our website.  
<https://www.ntnglobal.com/en/csr/sc/client.html>

## CSR questionnaire for suppliers

To raise recognition for the NTN CSR Procurement Guidelines and check compliance with them, we annually conduct a survey for our business partners.

For the fiscal year ended March 31, 2019, we widened the scope of survey and implemented at 489 business partners, up 196 from the previous survey.

We found that about 80% of our business partners are adequately managing compliance, human rights and labor, quality and safety and information security. However, we found that about half of our business partners were in the process of working on the environment, business continuity plans, social contributions and CSR procurement, or would need some time before taking on such tasks.

To have our business partners understand the importance of CSR procurement throughout the entire supply chain, we will continue our awareness-raising activities.

## Subcontracting Act compliance work

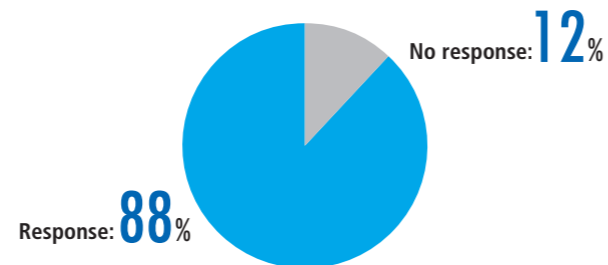
We conduct self-audits for our subcontracting in order to maintain the appropriateness of our subcontracting activities. To have our domestic business sites autonomously self-audit their compliance with the Subcontracting Act, we implement a certification system for "subcontracting self-auditor." In September 2018, we held a subcontracting self-auditor training course and newly certified 40 self-auditors for a total of 82 certified self-auditors. Domestic business sites (22 sites) conducted self-audits led by the self-auditors.

## Conflict minerals survey

We conduct a survey periodically, to ensure that certain materials and our finished products do not contain particular materials that could be a source of funds for armed groups in conflict zones, or misused for immoral issues such as human rights violations, illegal mining or smuggling. We respond to customer's inquiries concerning conflict materials based on the results of this survey.

In the fiscal year ended March 31, 2019, we traced back through the supply chain to identify material refiners through a survey, requested to 304 business partners. More than 88% of partners responded with answers indicating that they do not use any conflict minerals. We will continue to conduct a survey periodically and monitor the inclusion of conflict minerals from conflict zones or high-risk zones.

### Business partner response rate



### TOPICS

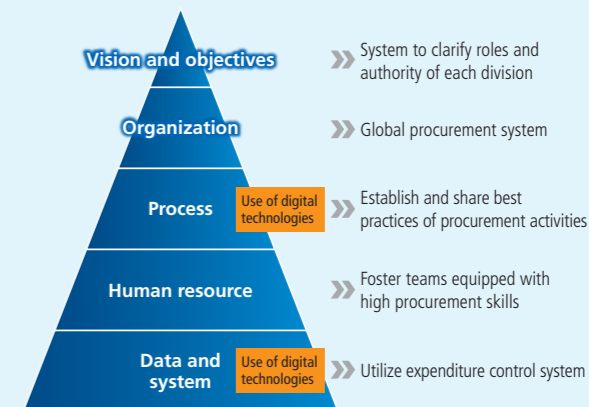
## NTN global procurement organization, transform to renew NTN Group procurement way



Operating Officer,  
Procurement Headquarters  
**Herve Brelaud**

Ever more international markets, current uncertain business climate, innovation, digitalization, electrification, sustainability, ... are the challenges we aim to overcome. NTN Group objectives can only be achieved through strategies that are focused on performance and profit. Establishing a World-Class Procurement Organization and creating our own NTN Procurement Way, focused on overall cost performance, will contribute to increase NTN Corporate Value.

The Medium-term Management Plan "DRIVE NTN 100" has initiated deep structural reforms. The combined goals of concentrate NTN manufacturing sector on high added-value products and growing areas has led to drive the reformation variable cost structure and establish Procurement Headquarters in April 2018. A real Transformation of our Global Procurement organization has been engaged to reach our QCD (quality, cost and delivery) target in an efficient and sustainable way, in order to take the full benefits of the company globalization and scale.



### Vision and objectives

We aim to establish a World-Class Procurement Organization to achieve the high level of overall cost performance for the purchased goods and services, in close cooperation with our key suppliers. Creating our own NTN Procurement Way, recognized by our customers and suppliers, internal and external stakeholders, will be our contribution to increase the Corporate Value.

### Organization

Taking the benefit of NTN global presence, we will establish NTN Global Procurement Network in Japan, Europe, China, America, India and Asia, with the aim of promoting local procurement and global suppliers.

### Process

In the spirit "One Company, One Way", we aim to unify NTN best practices worldwide, promoting the wide utilization of digital tools. Global category management as well as a global sourcing will lead us to offer to our supplier base larger business opportunities and allow optimized overall cost performance.

### Human resource

The right person in the right place! Following Hitozukuri principle we intend to train intensively our procurement teams and actively promote global mobility.

### Data and system

At the heart of our global procurement organization, we will set up a lean and robust information system, taking advantage of the latest digital solution, to allow a consistent spend control as well as bringing NTN teams and our suppliers closer together.



# Monozukuri

## Basic approach to manufacturing (Monozukuri)

With customer satisfaction as our top priority, we aim to further improve our QCD (quality, cost and delivery). We will improve field capabilities of our manufacturing team through "KANZEN SEISAN\*" activity, and build global production systems based on at-local-site, with-local-material procurements. And we continue to meet our customers' needs under the production system optimized throughout overall SCM (supply chain management) which streamlines the logistics from supplier to customer.

\*"KANZEN SEISAN" means "perfect production" in Japanese.

## Streamlined production

As a part of the production reform promotion activities, we are taking initiatives to create factories where people, goods and information flow "NAMERAKA\*." In particular, we aim to streamline our entire SCM through shortened lead time from order to shipment by synchronizing things including suppliers and shortening/connecting production processes, as well as through effective inventory management. We aim to reduce "inventories (material inventory, in-process inventory, and finished good inventory) = invested capital" by creating the framework for overall optimization and promoting streamlined production. By improving return on invested capital (ROIC), we will strengthen the profitability and management performance of the entire NTN.

\*\*"NAMERAKA" means "smooth" in Japanese.

## Monozukuri that NTN aims to shape

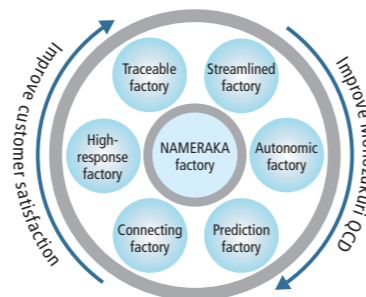
NTN is transforming from a "Manufacturing Company" into a "Company that Delivers Value to Customers through Products and Services." In the production reform, which is a base of our transformation, we promote streamlined productions, bring

Monozukuri sites and customers closer to each other through advanced and efficient productions utilizing robots and AI/ IoT as well as through SCM collaboration, and thereby deliver higher value to customers.

### Six concepts

1 Streamlined factory	: Streamlining	▶ Reduced inventories and small-lot production
2 Autonomic factory	: Visualizing factory operations / Analysis	▶ Automated situational judgement (labor-saving)
3 Prediction factory	: Intelligent factory (utilization of AI)	▶ Predict disorders and changes
4 Connecting factory	: SCM (supply chain management) collaboration	▶ Shorten lead time through overall optimization
5 High-response factory	: Management of production capacity, cost and delivery	▶ Speedy quotation and prototyping ▶ Management decision-making prior to acceptance of new project orders
6 Traceable factory	: Utilize RFID/IPS (manage goods)	▶ Strengthen traceability and visualize progresses

### Monozukuri that NTN aims to shape



## Wakayama Works

Wakayama Works is currently under construction in Wakayama Prefecture as a new base designed to produce radial bearings, the core product of the Company. Due to a rapid development of electrification in the automotive industry in recent years, the market needs are rapidly expanding for radial bearings used for motors and drive systems with high value-added features such as low friction, low vibration and long operating life. Wakayama Works will concentrate on such high value-added products while actively outsourcing standard type products, by which we will reorganize our radial bearing production centering around the new production base.

Wakayama Works will reduce the delivery time of prototypes by half and the production lead time by one third, through smart factory efforts and an introduction of IoT and AI system-based new production machines, and speedily supply high quality products worldwide. We will strengthen the entire NTN Group's business by developing similar initiatives in Japan and overseas.



Construction of Wakayama Works in progress (photo taken in July 2019)

## Basic approach to quality and implementation system

NTN's Basic Quality Policy specifies all the basic principles that shape our manufacturing approach. We use it to work on maintaining and improving product quality throughout the world, working toward high quality that satisfies all our customers.

Our products are used in many applications around us, providing daily support. They are also found in equipment where life is at stake, such as aircraft, railway, automobile and medical equipment, and therefore, require extreme precision and durability. Every single employee understands the importance of Quality and works earnestly toward Quality to improve NTN brand globally.

### Basic Quality Policy

**Pursuing right quality to meet functions and specifications requested by our customers.**

- Applicable quality  
Our quality should immediately respond to the change of our customer's requirements.
- Competitive quality  
We have to win quality competition.
- Quality for economy  
Quality should benefit our company.

### Quality Slogan

**Quality is our future  
Quality paves the way for our future.**



## Quality management system

We are proactively acquiring ISO 9001 certification (international standard for quality management systems) at domestic and overseas production sites, as well as IATF 16949 certification (additional standard for the automobile industry). In the fiscal year ended March 31, 2019, three new sites have been certified. This means that, if we do not consider production sites which are still in development, all our domestic and overseas consolidated subsidiaries have now received the proper certification for their Quality Management System.

In addition, JIS Q9100 and Nadcap which are standards for the aerospace industry, and certification for the railway industry standards IRIS (Europe) and CRCC (China) are also obtained by relevant sites.

### Major certification achievements (Fiscal year ended March 31, 2019)

ISO 9001 (33 production sites certified)	
Japan	GREEN ENERGY PRODUCTS DIVISION
U.S.A	NTK PRECISION AXLE CORP.
IATF 16949 (37 production sites certified)	
U.S.A	NTN DRIVESHAFT ANDERSON, INC.

\* Applies to domestic and overseas consolidated manufacturing subsidiaries (excluding bases that have not started mass production)

## TOPICS Quality generates brand power

We define NTN's brand power as the ability to be chosen by customers. We are receiving high acclaims as we have been continuously delivering high-quality products to our customers for 100 years since the founding of the Company. However, as commoditization is progressing for many of NTN products such as bearings, it is not easy to differentiate ourselves from competitors. In this environment, by continuing to provide products and services that win our customers' satisfaction at appropriate prices, we will build up better relationships of trust and improve our brand power.

We guarantee the quality of all products we sell to our customers from "the moment we receive inquiry until the appropriate operating life of product ends." Sales divisions accurately identify operation environments and required specifications informed by customers, and share the information with technical and manufacturing departments. And the technical and manufacturing divisions complete productions complying with customer requirements, internal development steps and manufacturing rules to perfection. We have a system to follow up continually after sales in case any defect of a product is detected in the market, thereby making the guarantee possible from the moment we receive inquiry until the appropriate operating life of product ends.

As a recent trend, among major quality defects which largely affect the market, many of their initial causes lie hidden in the pre-mass production stage. Since the establishment of the Quality Assurance Headquarters in 2018, we also have been focusing on measures against quality defects arising from the working stage of engineering. We continue our Monozukuri openly and squarely by identifying quality risks and improving them, such as rules difficult to comply with from the perspective of actual manufacturing.

We promote local productions according to demands of global market, which we divide into four regions throughout the world. While localizing steel materials procurement and special processes, we strengthen rules to achieve globally standardized quality and build a global system to centrally manage quality information. To be chosen by customers with trust, the entire NTN Group will work as one to further strengthen its quality assurance system.



Operating Officer,  
Quality Assurance Headquarters  
Corporate General Manager

**Takashi Fujii**

Relationship to SDGs



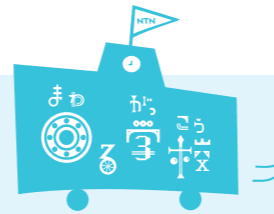
# Contribution to Local Communities

## Basic approach to contributions to local communities

One of the credos of NTN SPIRIT "Collaboration" states that "we take care of the natural environment and maintain coexistence with local community." In addition to contributing to society through our business activities, we also work on

achieving the UN's Sustainable Development Goals (SDGs) through various activities tied closely to local communities around the world.

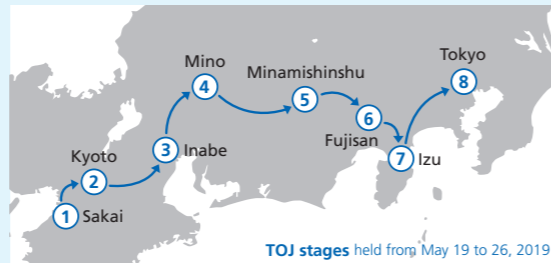
### TOPICS Spreading the circle of "NTN Rotating School"



To promote harmonious coexistence with local communities, the Company organized NTN Rotating School in 2017 as a way to facilitate community interactions for our employees and education for the next-generation. This is a mobile school based on the concept of having children of the next generation learn about the environment and energy saving with fun. In addition to the title sponsorship of "Tour of Japan (TOJ)," Japan's largest bicycle road race, we participate in various events held by public offices, and also hold events at business sites of the NTN Group.

In NTN's third year of sponsorship of TOJ in 2019, NTN Rotating School in 2019 implemented a program incorporating music. Participants created their own songs with musical instruments that used bearings, or performed one-minute pieces all together with musical instruments making various sounds under themes they decided. All children and adults enjoyed the program, and the venue was always surrounded by a "smooth" atmosphere. In the classroom-style Nameraka Eco-Friendly class, we had participants think energy saving as their own issues. The mobile school's various thinking-based programs attracted about 2,600 guests in the eight-day event. NTN Rotating School, in which employees acted as teachers, helps to aid their motivations by letting them deepen engagement between business sites and see smiles of guests.

In January 2019, NTN Rotating School was held overseas for the first time by NTN BEARING-THAILAND CO., LTD. in the Children Day, a science event held by the National Science and Technology Development Agency. A hand spinner contest as well as bearing assembling and friction experiences conveyed a fun of science while having them learn about the roles of NTN products and friction. The two-day event was attended by about 1,600 guests and ended in a great success. We will continue to develop the mobile school activities not only in Japan but also worldwide so that NTN Rotating School can entertain children all over the world.



Parents and children learning about energy saving in a Nameraka Eco-Friendly class



Enjoying making songs together with musical instruments that used bearings



Hand spinner contest in great excitement

## Activities worldwide

### Japan

To preserve biodiversity and contribute to the local community, Kuwana Works cooperated in Waterside Nature Observation Walk sponsored by Kuwana City. In addition to preparatory work to ensure the event to run safely, NTN staff researched waterside creatures on the river of Tadocho, Kuwana City together with specialists, and explained about them to children on the event day. At the end of the event, children gave reports on creatures they captured, and shared their thoughts about the event. They looked much interested in waterside creatures they rarely came in contact with in their daily lives.



Children looking for waterside creatures

### Europe

NTN Kugellagerfabrik (Deutschland) GmbH, NTN Waelzager (Europa) GmbH and SNR Waelzager GmbH joined the village festival of Peacevillage International. Peacevillage International provides medical treatments in Germany for children injured in war and conflict worldwide, and returns them to their home countries. At the village festival, NTN staff set up a corporate booth to interact with children protected in the facility using building blocks and other toys.



Village festival filled with many children and volunteers

### Dialog with university and high school students

As part of our CSR activities, we actively interact with students, who will shape the next generation. In October 2018, we invited eight students from Senri Senior High School in Osaka Prefecture to have dialog on our initiatives for diversity. We received feedback from the participants, such as, "the motivation to work overseas became even stronger after

### Americas

In August, NTN BEARING CORP. OF CANADA LTD. sends volunteers for bed making at the facility for homeless people operated by Good Shepherd\*-Toronto. The volunteers are normally students, but during the summer holiday season for schools, NBCC employees take turns in the volunteering work every day. In addition, NBCC gives donations together with collaborators who endorse this activity, such as our business partners.

\* Good Shepherd: Non-profit organization sponsored by Christian associations. It establishes and operates facilities for homeless people through charities such as donations in an effort to rescue socially vulnerable people in the spirit of Christianity.



Bed making

Employees participated in the activity

### Asia

Staff of NTN MANUFACTURING (THAILAND) CO., LTD. visited a support center for people with disabilities in Chonburi Province on Children's Day for the purpose of supporting autistic children. In addition to the donation of sweets, stationeries and play tools, a musical chairs game was held for recreation. NTN staff members and the children had sweets together, enjoyed their conversation, and deepened engagement.



Employees interacting with children

# Environment

## Basic approach

NTN Environment Policy has been created by the Group to contribute to the sustainable development of society. We have built an environmental management system that promotes environmental protection as well as energy and resource saving.



### NTN Environment Policy

Coexistence with the global environment is a top priority for the NTN Group. Our business activities are designed to prevent environmental pollution and preserve natural capital, while our technologies reflect our unwavering efforts to help ensure the sustainable development of society.

#### 1. Technologies to help prevent global warming

The NTN Group will help prevent global warming by developing and releasing new technologies and products that help save and create energy worldwide.

#### 2. Compliance

The NTN Group will comply with all applicable environmental laws and regulations, while proactively addressing concerns expressed by customers, local communities and other stakeholders.

#### 3. Reducing environmental impact from business activities

The NTN Group will minimize environmental impacts such as emissions of CO<sub>2</sub> and regulated substances from all NTN Group business operations, while working to identify and reduce environmental impact from both upstream and downstream supply chain processes (from suppliers to customers).

#### 4. Sustainable resource use

The NTN Group will adhere closely to the three Rs approach (Reduce, Reuse, Recycle) as we work on reducing waste and resource inputs such as water and raw materials and other resources.

#### 5. Rigorously managing environmentally hazardous substances

The NTN Group will practice green procurement, rigorously manage environmentally hazardous substances used in products and manufacturing processes, and work actively to replace highly hazardous substances with alternatives.

#### 6. Protecting biodiversity

The NTN Group will work on protecting biodiversity, playing an active role in forest preservation and other environmental protection projects in partnership with local communities.

#### 7. Communication

The NTN Group will inform all NTN Group employees about the NTN Environment Policy to raise environmental awareness. We will disseminate information on environmental initiatives widely to the general public to promote active communication with the general public.

#### 8. Continually improving environmental management system


The NTN Group will improve our environmental performance by implementing and continually improving our environmental management system.

### Environmental management structure based on the environmental management system

The NTN Group has acquired third-party certification globally for ISO 14001, an environmental management system. Our environmental management organization is structured to promote the compliance with environmental laws and regulations of each country and continually improve environmental performance.

For business sites in Japan, multi-site certification is acquired, and all business sites work together to achieve environmental targets under the top management led by directors in charge. We also organize sectional subgroups to address individual environmental issues. For example, the Energy-saving/Resource-saving Sectional Meeting studies and promotes energy-saving measures reducing CO<sub>2</sub> emissions as well as measures to introduce renewable energy. In the fiscal year ended March 31, 2019, the Company-wide Environmental Management Committee met four times and the Energy-saving/Resource-saving Sectional Meeting met once.

To maintain or improve the management system, a "on-site audit (annual)" by on-site auditors and a mutual "cross audit (every three years)" by business units are conducted.

 A list of our ISO 14001 certified business sites and their environmental performances can be viewed on our website. <https://www.ntnglobal.com/en/csr/environment/sitereport/iso14001.html>

















### Environmental education

The NTN Group conducts rank-based and function-based environmental education of various kinds. For example, our rank-based education programs include basic education at new employee induction training; practical education after workplace assignment; and education for newly appointed managers upon promotion in order to work on environmental issues at each workplace from the perspective of risk-benefit management. Our function-based education programs include education for sales divisions and distributors serving as a contact point for customers on the survey regarding environmentally hazardous substances that may be contained in our products. This program allows participants to learn about how to respond to customers as well as about relevant laws and regulations. Another such program is a training session to develop internal auditors for the environmental management system. Moreover, during the Environment Month every year in June, we rigorously train all employees on important environmental measures of the year, and provide education for raising their environmental awareness.


In the fiscal year ended March 31, 2019, we held a training session to develop internal auditors twice, inviting a chief lecturer from L. Marvin Johnson & Associates, Inc. Japan, a training institution for ISO auditors. We also organized environmental education for distributors at West Japan Sales Office and East Japan Sales Office (Tokyo Branch and Tohoku Branch) of NTN Sales Japan Corporation, and provided contamination prevention training for phthalate esters as part of the Environment Month activities.

## Company-wide environmental performance for the fiscal year ended March 31, 2019

 Achieved  Not achieved

NTN Environment Policy	Environmental Targets		Results	Self-evaluation	
Technologies to help prevent global warming	Developing and releasing new technologies and products that help save and create energy		CFJ-W development sHUB development		
Compliance	Ongoing rigorous management of hazardous materials		Rigorous inventory management and monthly self-auditing		
Reducing environmental impact from business activities	Reducing CO <sub>2</sub> emissions	Japan	296,000 metric tons/year max.*	289,000 metric tons/year	
		Overseas	370,000 metric tons/year max.	384,000 metric tons/year	
	Reducing CO <sub>2</sub> emissions intensity	Japan	26.4% reduction compared to fiscal year ended March 31, 1998*	25.1% reduction compared to fiscal year ended March 31, 1998	
		Overseas	10.9% reduction compared to fiscal year ended March 31, 2007	4.8% reduction compared to fiscal year ended March 31, 2007	
Sustainable resource use	Reducing water consumption	Japan	24.1% reduction compared to fiscal year ended March 31, 2011	16.8% reduction compared to fiscal year ended March 31, 2011	
		Overseas	13.9% reduction compared to fiscal year ended March 31, 2015	15.6% reduction compared to fiscal year ended March 31, 2015	
	Reducing waste, maintaining high recycling rates	Japan	99.8% min.	98.6%	
		Overseas	97% min.	96.7%	
Reducing paper and Styrofoam	Reducing paper purchase intensity	Japan	5.4% increase compared to fiscal year ended March 31, 2011	5.7% increase compared to fiscal year ended March 31, 2011	
	Reducing Styrofoam	Japan	Maintaining 99% reduction compared to fiscal year ended March 31, 2000	99% reduction compared to fiscal year ended March 31, 2000	
Rigorously management of environmentally hazardous substances	Managing and reducing PRTR substance	Japan	1% reduction compared to fiscal year ended March 31, 2018	4.6% reduction compared to fiscal year ended March 31, 2018	
Protecting biodiversity	"Kigyo no Mori" and other biodiversity protection activities	Japan	20 or more participating business sites	17 participating business sites	
		Overseas	12 or more participating business sites	11 participating business sites	
Continually improving environmental management system	Acquiring revised ISO 14001 (ISO 14001:2015) certification		Certification renewal completed in May 2019		


\*Calculated using a fixed CO<sub>2</sub> emissions factor of 0.381 for electricity.

 Business sites subject to company-wide environmental performance can be viewed on our website. <https://www.ntnglobal.com/en/csr/environment/sitereport/iso14001.html>

## Company-wide environmental targets for the fiscal year ending March 31, 2020

NTN Environment Policy	Environmental Targets			
Technologies to help prevent global warming	Developing and releasing new technologies and products that help save and create energy			
otectin	Ongoing rigorous management of hazardous materials			
Reducing environmental impact from business activities	Reducing CO <sub>2</sub> emissions	Japan	285,000 metric tons/year max.*	
		Overseas	378,000 metric tons/year max.	
	Reducing CO <sub>2</sub> emissions intensity	Japan	25.8% decrease for fiscal year ended March 31, 1998*	
		Overseas	5.5% decrease for fiscal year ended March 31, 2007	
Sustainable resource use	Reducing water consumption	Japan	17.3% decrease for fiscal year ended March 31, 2011	
		Overseas	16.7% decrease for fiscal year ended March 31, 2015	
	Reducing waste, maintaining high recycling rates	Japan	98.1% min.	
		Overseas	97% min.	
Reducing paper and Styrofoam	Reducing paper purchase intensity	Japan	3.8% decrease compared to fiscal year ended March 31, 2011	
	Reducing Styrofoam	Japan	4.9% increase compared to fiscal year ended March 31, 2011	
Rigorously management of environmentally hazardous substances	Managing and reducing PRTR substance	PRTR substance intensities	Japan	1% decrease compared to fiscal year ended March 31, 2019
Protecting biodiversity	"Kigyo no Mori" and other biodiversity protection activities		Increase in number of participating business sites	

\*Calculated using a fixed CO<sub>2</sub> emissions factor of 0.381 for electricity.

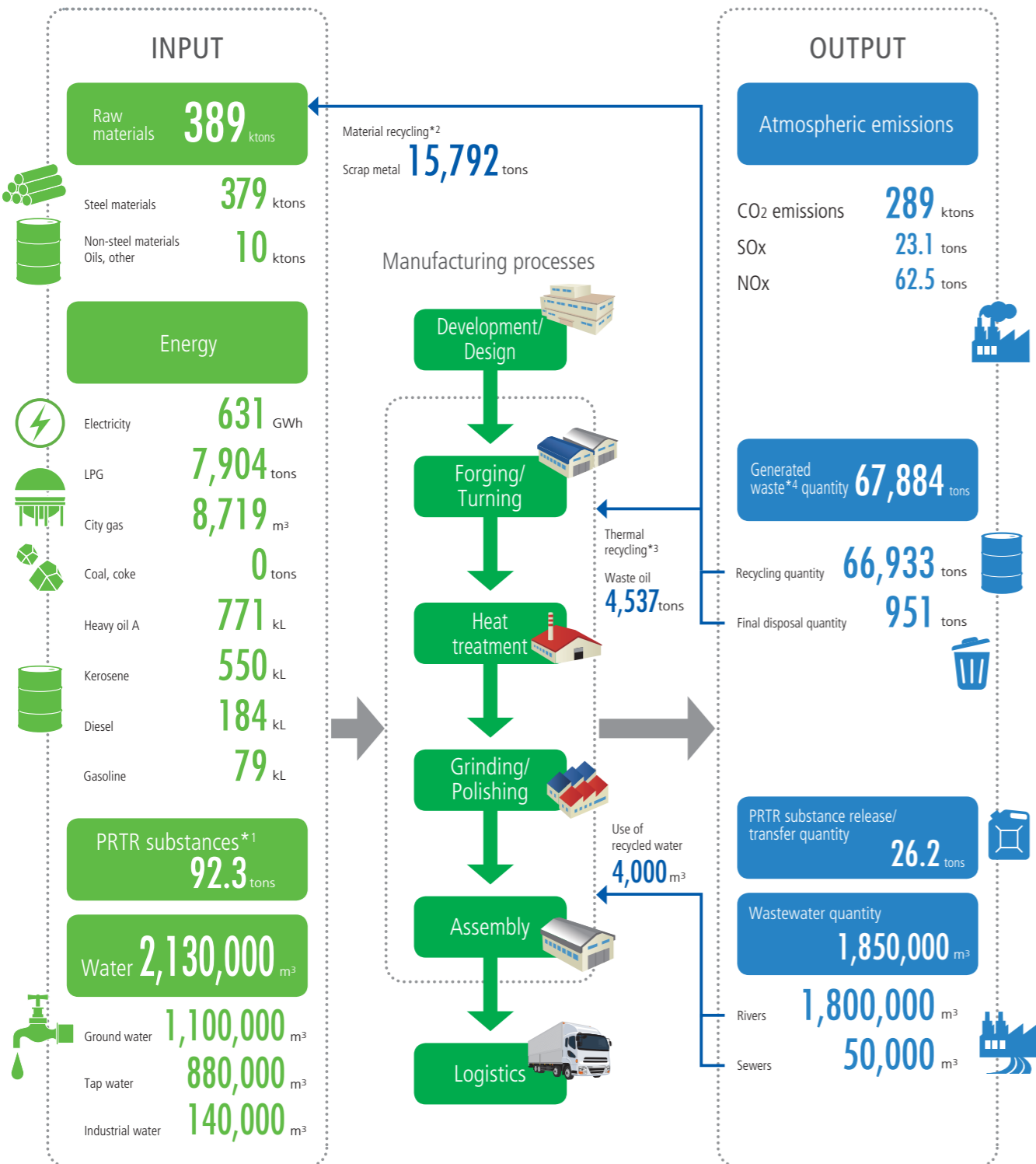
 Business sites subject to company-wide environmental performance can be viewed on our website. <https://www.ntnglobal.com/en/csr/environment/sitereport/iso14001.html>

# Environment

## Business activities and environmental impact

### Environmental impact from production activities in Japan (Fiscal year ended March 31, 2019)

#### Material flow chart (The NTN Group in Japan)



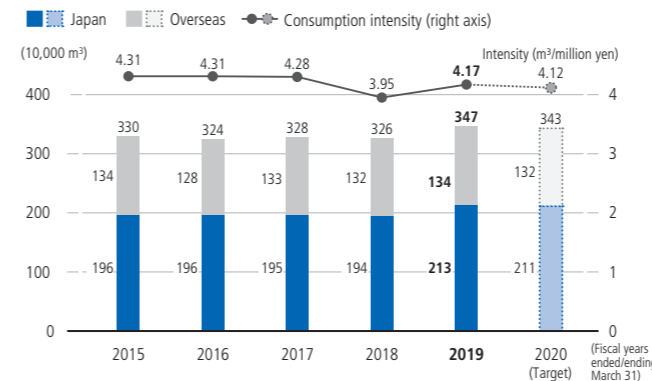
\*<sup>1</sup> PRTR substances: Substances regulated under Japan's PRTR (Pollutant Release and Transfer Register) Act.  
 \*<sup>2</sup> Material recycling: Recycling into raw materials.  
 \*<sup>3</sup> Thermal recycling: Recycling into fuel.  
 \*<sup>4</sup> Industrial waste.

Our environmental accounting data can be viewed on our website.  
<https://www.ntnglobal.com/en/csr/environment/operation.html>

## Resource protection

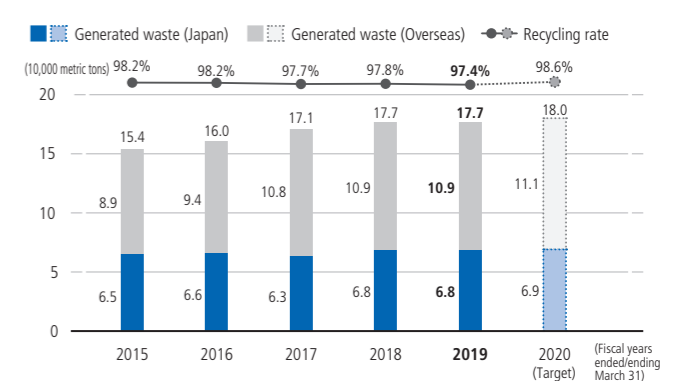
To protect the water resource, the NTN Group is globally working on reducing water consumption and improve water consumption intensity. We conduct water stress analysis by using Aqueduct (a tool released by the World Resources Institute (WRI) that provides free maps and information showing global water risks). We are also promoting mineral resource protection such as by reducing waste and maintaining/improving recycling rates.

### Water Consumption and Water Consumption Intensity (Japan/Overseas)



The results of the water stress analysis via Aqueduct and water consumption by region can be viewed on our website.  
<https://www.ntnglobal.com/en/csr/environment/v3.html>

### Waste Quantities and Recycling Rates (Japan/Overseas)



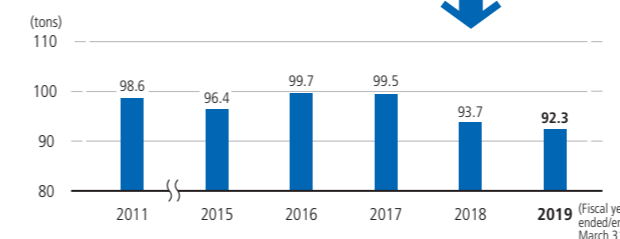
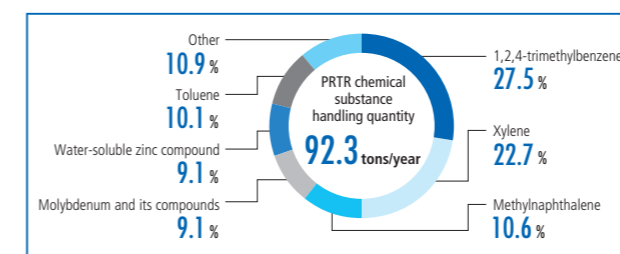
Business sites subject to water consumption/consumption intensity, waste quantities and recycling rates can be viewed on our website.  
<https://www.ntnglobal.com/en/csr/environment/sitereport/total.html>

## Managing and reducing environmentally hazardous substances

As part of efforts to reduce impacts on the global environment, the NTN Group practices green procurement while working to manage and reduce environmentally hazardous substances. In addition, the NTN Group identifies regulatory developments in Japan and overseas and complies with international environmental laws and regulations.

### Reducing PRTR chemical substance

We are working to reduce PRTR chemical substances (substances regulated under Japan's Pollutant Release and Transfer Register Act) during the production processes by the group companies in Japan and shifting to less hazardous alternatives. PRTR chemical substances handled in large quantities by the Company are the six substances shown in the chart below. They are used mainly in production processes and account for about 90% of the total of such substances. We will reduce these substances by shifting to alternative substances.



### Rigorously manage the inventories of products containing phthalate esters

The EU RoHS directive was revised and phthalate esters (DEHP, BBP, DBP and DIBP) were added to the list of prohibited substances effective as of July 22, 2019. To respond to this, the NTN Group amended the NTN Group Green Procurement Standards in April 2018, in which we designated phthalate esters as prohibited substances and prohibited productions and sales of products containing phthalate esters. In addition, we took following measures to prevent products that were manufactured before April 2018 and contain phthalate esters from being accidentally distributed in the market.

- Disposal of products containing phthalate esters (certain exceptions apply by customers' requests)
- Rigorous management of inventories of products containing phthalate esters (order and shipping system requiring mandatory signature of approval by customers)
- Strengthening of our inspection system (installed an analyzer at major business sites)



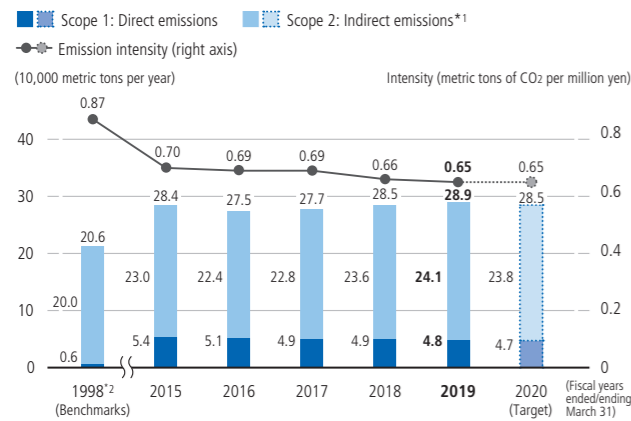
Analyzer for phthalate esters

# Environment

## Preventing global warming

The NTN Group works on reducing CO<sub>2</sub> emissions and emissions intensity throughout all business activities. To guarantee the data reliability, our emissions data is subjected to third-party verification by inspection and certification authority SGS Japan. We plan to increase the scope of the reduction and work to reduce CO<sub>2</sub> emissions throughout the entire supply chain including our business partners.

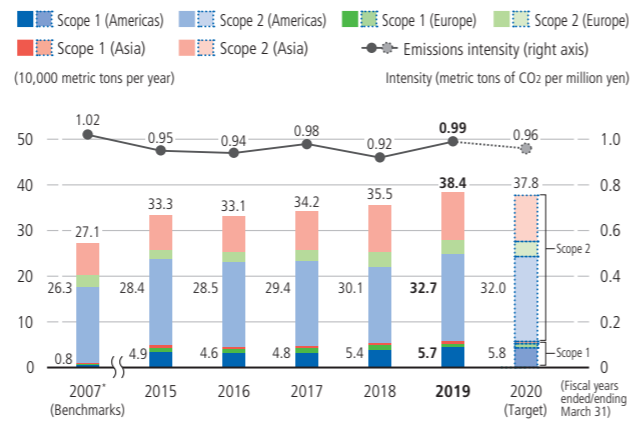
### CO<sub>2</sub> Emissions/Emissions Intensities (Japan)



\*1 Japan figures are calculated using a fixed emissions factor of 0.381 for electricity.  
\*2 The first year of production is used as the benchmark for business sites established after the fiscal year ended March 31, 1998.

The Verification Statement by SGS Japan can be viewed on our website.  
<https://www.ntnglobal.com/en/csr/environment/co2.html>

### CO<sub>2</sub> Emissions/Emissions Intensities (Overseas)

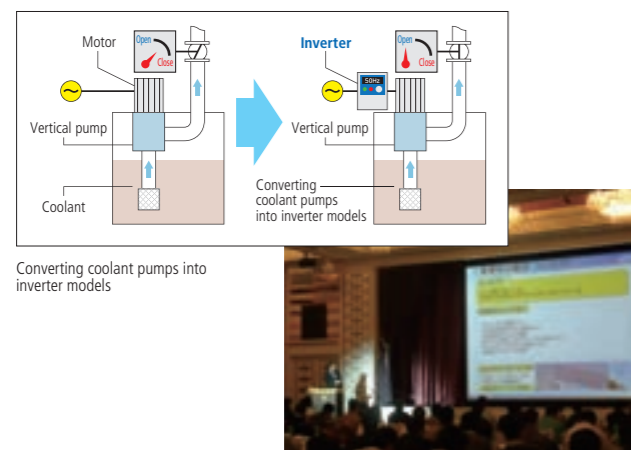


\* The first year of production is used as the benchmark for business sites established after the fiscal year ended March 31, 2007.

Business sites subject to CO<sub>2</sub> emissions/emissions intensities can be viewed on our website.  
<https://www.ntnglobal.com/en/csr/environment/sitereport/iso14001.html>

### NTN Fukuroi Corporation Converting coolant pumps into inverter models

The NTN Group optimizes emissions by converting motors for pumps and compressor into inverter models. As coolant pumps at NTN Fukuroi Corporation were operated at a fixed rotation speed, coolant emissions were kept at a constant level and the excess coolants were fed back to tanks through bypass valves. We reduced electricity by 6,600 kWh/year by optimizing the emissions by converting pumps into inverter models and adopting PID control by emission pressure. NTN Fukuroi Corporation gave a presentation on this activity at the energy-saving seminar sponsored by CHUBU Electric Power Co., Inc.



Converting coolant pumps into inverter models  
Presentation at the energy-saving seminar sponsored by CHUBU Electric Power Inc.

### SHANGHAI NTN Corporation Renewal of compressor

To reduce the power consumption of compressors, SHANGHAI NTN Corporation (China) replaced aged compressors at their driveshaft parts plant (75 kW, 9 units) with high-efficiency compressors (160 kW, 4 units). The hub bearing plant also replaced 4 units of 160 kW compressors with a higher efficiency type (110 kW, 4 units). In both instances, the cooling system was changed from air-cooled to water-cooled to accommodate the high temperature in summer. To secure optimal supply pressure and volume to machines, a pressure sensor was installed on piping systems. Electric energy was saved by 1,163,645 kWh/year by the optimized emissions from compressors at the target value measured by the pressure sensor, using inverters and unit count control.



High-efficiency compressor

### NTK PRECISION AXLE CORP. Installation of high-efficiency compressors

NTA PRECISION AXLE CORP. has been leasing an auxiliary compressor to cover the deteriorating performance of existing compressors due to aging. However, its maintenance cost and power consumption were increasing year by year.

As a solution, they leased a high-efficiency compressor with a power consumption 20% lower than the existing on all-inclusive contract including maintenance, by which the power consumption was reduced by 3,238,200 kWh per year.

### Division received Nikkei Global Environmental Technology Award

NTN has developed the world's first water flow-through hydro power generator and released it in the market as NTN Micro Hydro Turbine for electricity sales. On October 30, 2018, NTN received the Nikkei Global Environmental Technology Award by Nikkei Inc. Its unique mechanism which is a recent innovation by NTN, future potentials of the electricity grid connection system and the level of practical use, are recognized. This award is given to commend technological developments, etc. that helps to establish a sustainable global environment by comprehensively evaluating their originality and future potentials, such as prevention of global warming and preservation of the natural environment and ecosystem. NTN Micro Hydro Turbine won the award as it was highly acclaimed for its ability to generate power simply by being placed in an existing water channel without a need for developing the water level difference, its low installation cost, and the fact that it is already in practical use. NTN Micro Hydro Turbines are in use at various sites as it is recognized as a significant product for the sustainability of society, which contributes to the reduction of CO<sub>2</sub> emissions and can help to ensure the preservation of the natural environment and ecosystem.



NTN Micro Hydro Turbine

Nikkei Global Environmental Technology Award

## Protecting biodiversity

The NTN Group works on protecting biodiversity through natural environment protection activities in the local areas of each business site in collaboration with community residents and NPOs.

### NTN Shika Corporation Recognized by Ishikawa prefecture for participating in Ishikawa "Wagamachi" Adopt program activities.

The original Adopt program began in 1985 in the State of Texas, U.S.A. in which public spaces on roadside, etc. are adopted as "children" by residents and civil groups as "parents" who take a responsibility for cleaning and greening activities. NTN Shika Corporation signed an agreement with the Ishikawa Prefectural Government in March 2013 to participate in their activities. NTN Shika Corporation works to maintain the local scenery through activities such as planting Noto Kirishima Azalea, the local flower of Noto, along the highway facing the entrance of the company, as well as planting and maintaining cherry blossom trees on its premises along the roads. In October 2014, NTN Shika Corporation was honored with the President Award by Japan Greenery Research and Development Center, and also in October 2018 received a certificate of appreciation from the Governor of Ishikawa Prefecture for the 5 years of continuing activities.



Certificate of appreciation presentation ceremony

### Kuwana Works Environment education activities for local residents in collaboration with municipalities

Since 2010, Kuwana Works has been engaging in forest maintenance activities of Mt. Tado, the local mountain, in the cooperation with certified NPO "Mori no Kaze." The forest maintained by Kuwana Works was named as "NTN Komorebi no Mori," where NTN employees and their family members work on improving the local natural environment while learning about forest maintenance such as planting, pruning and thinning. As part of this, since 2017 they have been conducting forest education activities for local residents in collaboration with the Kuwana City Government. In the fiscal year ended March 31, 2019, 23 residents in 8 groups participated in the forest walk at Komorebi no Mori, experiencing forest maintenance activities such as measuring tree trunks using a special instrument, pruning using ladders, cutting logs and making a bird call tool using thinned woods. Also, as a new initiative, they began an activity to observe rare aquatic creatures in local rivers with external guest lecturers. Kuwana Works will extend environmental education opportunities from inside to outside of the company, helping to raise environmental awareness.

TOPICS

# Technologies for measures against climate change

NTN develops business activities based on our corporate philosophy "We shall contribute to international society through creating new technologies and developing new products," and the paragraph 1 of the NTN Environment Policy "Technologies to help prevent global warming."

As bearings and driveshafts, which are main products of NTN, contribute to the reduction of energy loss in finished products of our customers equipped with them (hereinafter referred as "Finished Products"), all of these products can be considered as environmentally friendly products. They

include products which are already commonly used in society because of the achievement of predecessors, as well as those with environmental contributions further enhanced by NTN's engineering and development capabilities.

NTN continues unwavering efforts to realize its corporate philosophy by developing and providing higher-grade products that contribute to the environment while classifying the products according to environmental contribution levels based on our standards.

## Definition of environment-contributing product

### (1) Classification and grades of NTN products and their definition

Classification	Grade	Definitions
Environment-contributing products	● S-eco (Super eco)	Classified according to environmental factor standards specified for different products in line with world's technology standards
	● A-eco (Advanced eco)	
	● B-eco (Brilliant eco)	
	● C-eco (Creative eco)	
	● D-eco (Diffused eco)	Products that help to reduce energy loss of Finished Products at the same performance level of around 1997

### (2) Calculation methods for environmental factors and eco-efficiency

To quantify products' environmental friendliness, NTN adopted environmental factors and eco-efficiency that are defined in the formula ① and ② as follows.

$$\text{Environmental factors} = \frac{\text{Eco-efficiency of developed products}}{\text{Eco-efficiency of benchmark products}^{*1}} \dots \text{①}$$

$$\text{Eco-efficiency} = \frac{\text{Product value}^{*2}}{\text{Environmental impact}^{*3}} \dots \text{②}$$

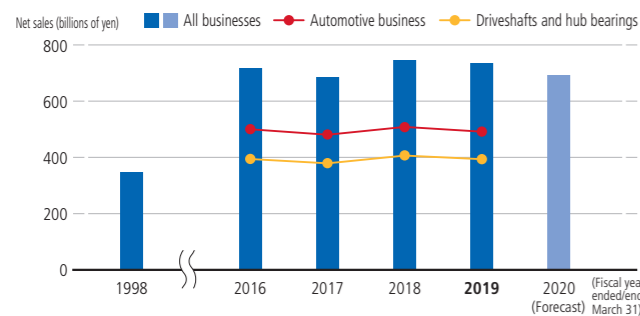
\* 1. D-eco product  
 \* 2. Values are quantified by using the QFD method (including CO<sub>2</sub> reduction contribution as Finished Products)  
 \* 3. From the perspective of evaluating contribution toward measures against climate change, environmental impact are calculated as CO<sub>2</sub> emissions generated throughout the process of raw materials mining to production (used the LCI calculation tool by the Japan Auto Parts Industries Association)

## Trend in achievements and forecasts

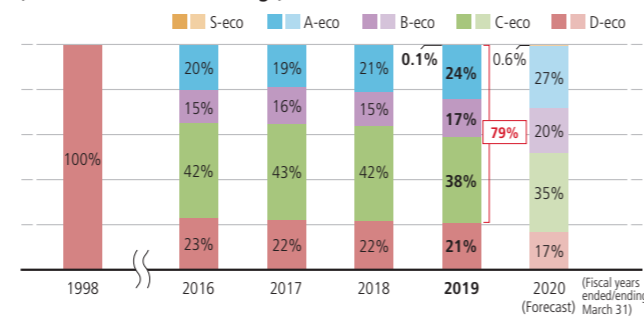
### (1) Sales ratio of environment-contributing products among driveshafts and hub bearings

Driveshafts and hub bearings, accounting for about 60% of our net sales, are all environment-contributing products. Among them, the sales ratio of S to C-eco grade products, which show the achievement of NTN's development efforts in recent years, continues to rise year by year, reaching 79% in the fiscal year ended March 31, 2019. In the fiscal year ending March 31, 2020, it is expected to go up to 83%.

#### Trend in net sales



#### Trend in composition of environment-contributing products by grade (driveshafts and hub bearings)

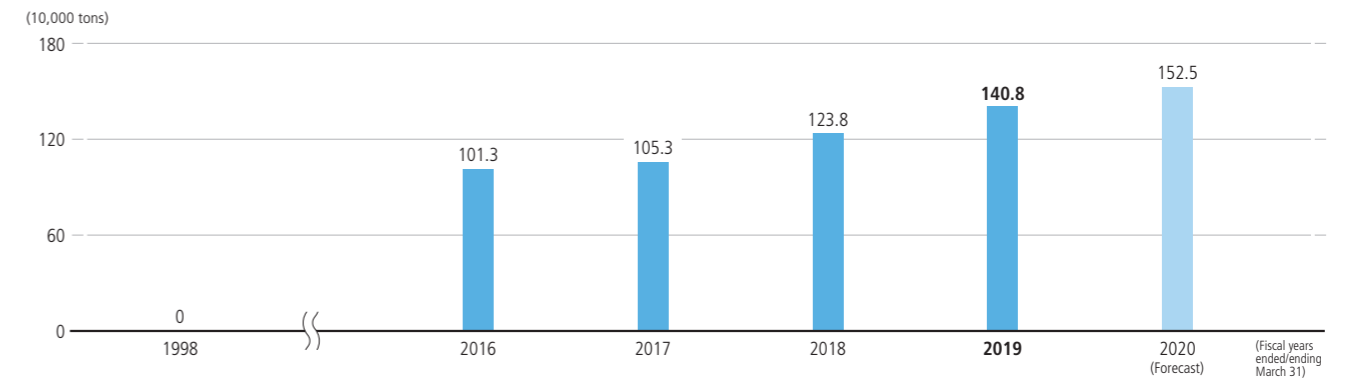


### (2) Contribution to CO<sub>2</sub> reduction from driveshafts and hub bearings

NTN calculates the amount of CO<sub>2</sub> emissions that can be reduced by the contribution of S to C-eco products throughout the assumed life period of Finished Products in comparison to the amount of CO<sub>2</sub> emissions in case D-eco products are continued to be used in Finished Products instead. Such amount is defined as "Contribution to CO<sub>2</sub> reduction" of the year the product was sold.

The contribution to CO<sub>2</sub> reduction from driveshafts and hub bearings for the fiscal year ended March 31, 2019 was approximately 1,400,000 tons (equivalent to approximately 600,000 liters of gasoline). Approximately 1,500,000 tons are forecasted for the fiscal year ending March 31, 2020.

#### Contribution to CO<sub>2</sub> reduction



[Calculation standard] JAPIA LCI Calculation Guidelines by Japan Auto Parts Industries Association (Consumer Use-Phase LCI calculation tool)

## Main environment-contributing products

#### S-eco Contribution to CO<sub>2</sub> reduction: 100 kg/unit

**Low Friction Hub Bearing III (released in 2019)**

A world's top standard low friction hub bearing. It can reduce rotational friction by 62% in comparison to D-eco grade products.

#### S-eco Contribution to CO<sub>2</sub> reduction: 74 kg/unit

**CFJ (tire side) and PTJ (engine side)**

A product equipped with world's top standard high-efficiency low-vibration driveshafts CFJ (tire side) and PTJ (engine side). It can reduce the mass by 10% and improve transmission efficiency (torque loss ratio) by 50% in comparison to D-eco grade products.

#### B-eco Contribution to CO<sub>2</sub> reduction: 51 kg/unit

**Super Low Friction Hub Bearing (released in 2013)**

A hub bearing which can reduce frictions and suppress fretting at low-temperature as various low-friction items are used for grease and seals. It can reduce rotational friction by 33% in comparison to D-eco grade products.

#### A-eco Contribution to CO<sub>2</sub> reduction: 27 kg/unit

**EBJ (low-friction grease) and EDJ (engine side)**

A product equipped with world's top standard light-weight compact-size driveshafts EBJ (tire side) and EDJ (engine side). It can reduce the mass by 10% and improve transmission efficiency (torque loss ratio) by 27% by applying low-friction grease to EBJ in comparison to D-eco grade products.

## Future development (expansion of product categories)

Going forward, we will expand product categories subject to the calculation to include not only driveshafts and hub bearings but also other product and categories such as bearings. We will also seek the way to aggregate contributions from natural energy businesses such as NTN Micro Hydro Turbine.

## A Message from CFO

### We Focus on Improving Profit and Generating Free Cash Flow

Representative Executive Officer, Senior Managing Executive Officer  
CFO (Chief Financial Officer)




#### Overview of fiscal year ended March 31, 2019

As the first year of the new Medium-term Management Plan "DRIVE NTN100," the result was severe in the fiscal year ended March 31, 2019, recording a net loss for the first time in five years. Although it was profitable on the operating income and ordinary income levels, we recorded extraordinary losses of 19.3 billion yen in total, including impairment loss of 17.0 billion yen and loss related to Antimonopoly Act of 2.1 billion yen. As no tax effect could be applied for the impairment loss, tax expenses of 9.1 billion yen were incurred, resulting in a net loss attributable to shareholders (parent company) of 7.0 billion yen.

The impairment loss was resulted from advanced depreciation of fixed assets in manufacturing bases and manufacturing subsidiaries in Japan, which was conducted in light of the deteriorating market environment and the low growth potential in Japan, in order to transform ourselves into a profit-generating organization going forward.

One of the structural backgrounds is the declining investment efficiency in domestic productions. While many manufacturing bases and manufacturing subsidiaries exist in Japan, the production efficiency became more difficult to achieve structurally due to the diversification of production and increase in personnel expenses, which was not expected at the time of the establishment of these manufacturing sites. In addition to this situation, the head office expenses in Japan is increasing. Amid the sluggish growth in the domestic market, NTN has focused on expanding businesses in overseas markets, which has been strongly led by solid support by the head office, including R&D, production engineering, and quality control. The expenses that could be reasonably calculated had been allocated to overseas subsidiaries, yet the cost burden on the head office continued to increase to the point where it became difficult to cover such expenses by the scale effects gained from the matured market of Japan.

Against these structural backgrounds, we recently experienced a sharp increase of costs resulting from inefficient

production caused by rapidly increased demands in the industrial machinery market and external environments affected by a sharp price rise of steel materials and supplementary materials.

In addition to these costs, we made investments aiming for future business growth and higher asset efficiency, such as new Wakayama Works and the core IT system renewal. These investments will bring positive effects through higher efficiency in the future, but at current stage, it weighed on profit due to the burden of partial amortization as well as increased advance expenses.

To date, even under difficult external environments, our domestic businesses were able to earn certain profits through cost reductions. However, as the domestic market became matured, coinciding with the increase in cost burden mentioned above, it became structurally difficult to generate profits and this resulted in the recording of the impairment loss this time.

#### Aiming for medium- to long-term profit improvement

As seen in the background of the impairment loss, operating margin for the latest period declined, affected by inefficient production caused by the rapidly increased demand, a sharp price rise for steel materials and supplementary materials, and increased costs caused by investments for the future. Operating margin for the fiscal year ending March 31, 2020 is forecasted to decline again, and it is affected by increases in the amortization burden and expenses related to the core IT system, in addition to the increase in accounting expenses related to personnel expenses. As to expenses other than these, we continue to work on reductions. Following the impairment loss recorded, we must improve profits for domestic businesses in preparation for the domestic market maturing further. While a time to be patient will continue in the medium term, I believe necessary investments for a growth in the next 100 years should be made.

	DRIVE NTN100		
	Achievements for the fiscal year ended March 31, 2019	Forecast for the fiscal year ending March 31, 2020	Plan for the fiscal year ending March 31, 2021
Net Sales	733.6 billion yen	690.0 billion yen	800.0 billion yen
Operating Income	26.9 billion yen	15.0 billion yen	57.0 billion yen
Operating Margin	3.7%	2.2%	7.1%
Net Income Attributable to Shareholders (parent company)	-7.0 billion yen	3.0 billion yen	30.0 billion yen
Capital Expenditures	45.2 billion yen	50.0 billion yen	150.0 billion yen (3 years) (including 20.0 billion yen of intangible capital expenditures)
Free Cash Flow	-22.4 billion yen	0.0 billion yen	45.0 billion yen (3 years)
Inventory Turnover Ratio	3.8 times	4.0 times	4.5 times
Net D/E Ratio	1.2	1.2	1.0 or less
Equity to Capital Ratio	27.4%	26.9%	30% or more
ROE	-2.9%	1.3%	10.0% or more
NTN-ROI <sup>*1</sup>	4.0%	2.1%	7.5% or more
Dividend Payout Ratio/Dividends	15.0 yen	15.0 yen	15.0 yen or more
Foreign Exchange Rate	USD	JPY 110.9	JPY 107.0 <sup>*2</sup>
	EUR	JPY 128.4	JPY 120.0 <sup>*2</sup>

\*1 NTN-ROI: Net operating income after tax ÷ (tangible fixed assets + inventories)

\*2 Assumed exchange rate after the second quarter of the fiscal year ending March 31, 2020

#### Toward achieving "DRIVE NTN100" numerical targets

Having completed the first year of the Medium-term Management Plan, we are reminding ourselves once again that the results deviated from our numerical targets. At the same time, we keenly realize the necessity of continuing and accelerating the measures to strengthen our management base, which supports our medium to long-term growth. The main initiatives for the second year comprise, as stated in the "Management Commitment," three measures for the structural reform of manufacturing divisions in Japan: i) break away from self-sufficiency, ii) variable cost reformation, and iii) restructure of business.

Moreover, we focus on improving profit and creating free cash flow for the fiscal year ending March 31, 2020. In the fiscal year ended March 31, 2019, inventories did not decrease as much as expected, affected by inefficient production and a sharp decrease of demands. For the fiscal year ending March 31, 2020, however, while securing necessary inventories for aftermarket applications, we will ensure the reduction of inventories from OEM business for the automotive and industrial machinery markets. Also, in the fiscal year ended March 31, 2019, increases in inventories and loans resulted in the deterioration of D/E ratio. Therefore, as a near-term basic policy for capital expenditures in the second year, investments in property, plant and equipment will be made within the amount of depreciation expenses. In the three years of the Medium-term Management Plan, we will generate free cash flow as our priority by reducing the capital expenditure from initially-expected 150.0 billion yen to 130.0 billion yen. Break away from self-sufficiency, one of the measures for the structural reform of our domestic manufacturing divisions, is also aimed to generate cash flow. We will again rigorously remind ourselves of the approach to pursue profit on both selling price and production fronts, as we execute each measure.

#### Evaluating business performance based on EVA and ROIC

Starting from the fiscal year ended March 31, 2019, we began to further develop our business performance evaluation system. In addition to existing profit management such as on net sales and operating margin, we incorporated EVA and ROIC as well into business performance indicators for the purpose of accelerating our business operation to maximize corporate value from a perspective of creating value for shareholders. In light of unsatisfactory results in the first year of the Medium-term Management Plan, we take countermeasures in the second year by incorporating the concept of capital cost more clearly and continuing to develop the performance evaluation system, by which we aim to achieve our targets.

#### What CFO should do toward targets in the next 10 years

NTN seeks to transform from a "Manufacturing Company" into a "Company that Delivers Value to Customers through Products and Services." As CFO, I will establish the management foundation that supports this transformation. As our business further expands into the more global arena, I will comprehensively manage the entire NTN Group, and make our global cash management evolve into a system that can entirely optimize cash efficiency and financial risks. I will support the sustainable growth of NTN Group companies by identifying their situations more than ever, optimally allocating capital globally, and at the same time rigorously enforcing financial discipline.



# Consolidated Financial Indicators (Past 11 Years)

Fiscal years ended March 31

Thousands of U.S. dollars\*1  
(Excluding per-share values)

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2019
For THE YEAR DATA													
Net Sales	(Millions of yen)	527,100	452,746	530,056	543,468	539,595	638,971	701,900	716,997	683,329	744,373	733,569	6,630,533
Operating Income	(Millions of yen)	9,479	1,399	24,560	20,724	7,278	33,004	43,851	47,770	35,623	39,609	26,946	243,558
Operating Margin	(%)	1.8	0.3	4.6	3.8	1.3	5.2	6.2	6.7	5.2	5.3	3.7	3.7
Income (loss) before Income Taxes	(Millions of yen)	(10,104)	(1,838)	22,855	16,357	(13,898)	(2,451)	37,063	26,943	14,890	26,906	2,939	26,565
Net Income (Loss) Attributable to Shareholders (parent company)	(Millions of yen)	(8,985)	(2,015)	14,399	5,993	(14,196)	(14,648)	23,353	15,037	2,831	20,374	(6,958)	(62,891)
Capital Expenditures	(Millions of yen)	49,594	21,504	29,700	54,440	48,979	33,162	31,266	36,300	35,398	37,589	45,172	408,298
Depreciation and Amortization	(Millions of yen)	45,759	40,702	35,936	34,175	34,841	39,315	40,392	38,278	36,629	37,506	38,926	351,842
R&D expenditures	(Millions of yen)	17,402	14,687	15,697	17,157	16,174	17,821	18,088	18,481	19,196	21,007	21,661	195,788
YEAR-END DATA													
Total Assets*2	(Millions of yen)	627,613	618,802	632,001	693,258	768,462	848,037	856,277	794,651	798,891	839,427	840,751	7,599,322
Net Assets	(Millions of yen)	192,223	214,551	210,353	212,126	211,743	213,369	262,559	248,505	245,050	269,760	246,405	2,227,189
Inventories	(Millions of yen)	140,466	126,663	136,985	155,107	163,287	166,484	184,128	178,220	171,482	179,738	194,505	1,758,078
Interest-bearing Debt	(Millions of yen)	275,996	231,638	223,284	271,978	360,802	381,767	359,105	325,174	320,170	320,832	350,345	3,166,674
Number of Employees		20,679	17,959	19,172	20,789	21,398	22,156	23,360	24,109	24,665	25,493	24,988	24,988
PER-SHARE DATA													
Net Assets	(Yen)	376.77	374.19	376.05	370.19	375.84	374.68	461.21	436.97	431.66	477.17	433.32	3.92
Net Income (Loss)	(Yen)	(19.14)	(4.00)	27.08	11.27	(26.69)	(27.54)	43.91	28.28	5.33	38.36	(13.10)	(0.12)
Cash Dividends	(Yen)	13.00	8.00	10.00	10.00	0	2.00	6.00	10.00	10.00	15.00	15.00	0.14
OTHER INFORMATION													
Inventory Turnover Ratio	(Times)	3.8	3.6	3.9	3.5	3.3	3.8	3.8	4.0	4.0	4.1	3.8	
Net D/E Ratio	(Times)	1.38	1.00	0.92	1.11	1.37	1.27	1.11	1.11	1.05	0.93	1.16	
Net Income (loss)/Average Total Assets (ROA)	(%)	(1.3)	(0.3)	2.3	0.9	(1.9)	(1.8)	2.7	1.8	0.4	2.5	(0.8)	
Net Income (loss)/ Average Shareholders' Equity (ROE)	(%)	(4.3)	(1.1)	7.2	3.0	(7.2)	(7.3)	10.5	6.3	1.2	8.4	(2.9)	
NTN-ROI*3	(%)	1.5	0.2	4.2	3.4	1.1	4.6	6.3	6.5	5.1	5.7	4.0	
Equity to Capital Ratio	(%)	28.2	32.2	31.6	28.4	26.0	23.5	28.6	29.2	28.7	30.2	27.4	

\*1: The translation of yen amounts into U.S. dollar amounts is included solely for the convenience of readers outside Japan and has been made at ¥110.635 = U.S. \$1.00, the exchange rate prevailing on March 31, 2019.

This translation should not be construed as a representation that yen can be converted into U.S. dollars at the above or any other rate.

\*2: The figures for the fiscal year ended March 31, 2018 have been retroactively revised by "Partial Revision of the Accounting Standard for Tax Effect Accounting." Prior to the fiscal year ended March 31, 2018, no retroactive application was made.

\*3: NTN-ROI = Net operating income after tax/(tangible fixed assets + inventories)

# Management Performance/Financial Analysis

## Net sales and incomes

### Sales performance

Consolidated net sales for the fiscal year ended March 31, 2019, were 733,569 million yen, a decrease of 10,804 million yen (down 1.5%) from the previous fiscal year. Due to the effects of exchange-rates, a decrease of 4,044 million yen represented a decrease of 6,759 million yen. Overseas sales were 526,320 million yen, a decrease of 13,728 million yen (down 2.5%) from the previous fiscal year. Overseas sales accounted for 71.8% of net sales overall (Americas 27.5%, Europe 22.9%, Asia and others 21.4%), a decrease of 0.9 percentage points from the previous fiscal year.

### Net sales and incomes by business sector

In aftermarket applications, sales were 118,849 million yen (up 1.8% from the previous fiscal year) due to an increase in sales from industrial machinery aftermarket. Operating income was 15,184 million yen (up 1.2% from the previous fiscal year) due to the effect of increased sales and other factors.

In industrial machinery applications, net sales were 123,398 million yen (up 3.6% from the previous fiscal year) due to the increased customer demand for wind turbine and aircraft applications. Operating income was 3,106 million yen (up 11.1% from the previous fiscal year) due to the effect of increased sales and other factors.

In automotive applications, net sales were 491,322 million yen (down 3.4% from the previous fiscal year) due to the decreased customer demand and other factors. Operating income was 8,656 million yen (down 60.3% from the previous fiscal year) due to the rise of steel materials prices and U.S.A. customs duty rates and an increase in fixed cost.

### Net sales by region

In terms of sales in Japan, looking at aftermarket applications, there was an increase in industrial machinery aftermarket applications. As for sales of industrial machinery applications, construction machinery and machine tools, other applications increased. In automotive applications, sales grew thanks to expanded customers' demands. As a whole, net sales were 207,249 million yen (up 1.4% from the previous fiscal year).

In terms of sales in the Americas, looking at aftermarket applications, there was an increase in both industrial machinery aftermarket applications and automotive aftermarket applications. In industrial machinery applications, sales increased in wind turbine applications and others. Sales of automotive applications decreased due to the decreased customer demands and other factors. As a whole, net sales were 201,464 million yen (down 0.1% from the previous fiscal year).

In terms of sales in Europe, looking at aftermarket applications, there was a decrease in automotive aftermarket applications. In industrial machinery applications, sales increased in aircraft applications. Sales in automotive applications decreased due to decreased customers demand in response to the new gas emission standard and other factors. As a whole, net sales were 167,826 million yen (down 4.4% from the previous fiscal year).

In terms of sales in Asia and others, looking at aftermarket applications, there was an increase in both industrial machinery aftermarket applications and automotive aftermarket applications. In industrial machinery applications, sales

increased in construction machinery, wind turbines and other applications. Sales of automotive applications decreased due to the decreased customer demands caused by the slowdown of Chinese market and other factors. As a whole, net sales were 157,030 million yen (down 3.5% from the previous fiscal year).

### Cost of sales and selling, general and administrative expenses

The cost of sales was 603,082 million yen, up 1.1 percentage points and representing 82.2% of consolidated net sales.

Selling, general and administrative expenses were 103,541 million yen, representing 14.1% of consolidated net sales, or up 0.5 percentage points compared to the previous fiscal year.

### Income

Regarding profit for the fiscal year under review, factors contributing to increased earnings included the effects of scale. Meanwhile, factors contributing to decreased earnings included increased personnel expenses and increased variable cost as well as other expenses incurred. As a result, the operating income for the term was 26,946 million yen, down 12,663 million yen (down 32.0%) from the previous fiscal year. Operating margin was 3.7%, down 1.6 percentage points from the previous fiscal year.

Other expenses amounted to a net expense of 4,714 million yen. The major contributing factors were income of 5,689 million yen, including dividend income of 1,173 million yen, interest income of 791 million yen and equity in earnings of unconsolidated subsidiaries of 73 million yen, and expenses of 10,404 million yen, including interest expenses of 3,883 million yen and foreign exchange losses of 3,032 million yen. As a result, ordinary income for the term was 22,231 million yen, down 9,019 million yen (down 28.9%) from the previous fiscal year. Ordinary profit margin was 3.0%, down 1.2 percentage points from the previous fiscal year.

In addition, we recorded impairment loss of 16,963 million yen, loss related to Antimonopoly Act of 2,108 million yen, and loss on sales of shares of subsidiaries and associates of 221 million yen recorded as an extraordinary loss. As a result, net loss attributable to shareholder (parent company) was 6,958 million yen, down 27,332 million yen from the previous fiscal year. Net loss per share was 13.10 yen.

Regarding annual dividends for the fiscal year under review, we plan to pay a year-end dividend of 7.5 yen per share, which, when added to our interim dividend of 7.5 yen per share, totals 15 yen per share for the full year.

## R&D and capital expenditures

### R&D expenditures

Groupwide R&D expenditures for the year were 21,661 million yen (up 654 million yen from the previous fiscal year), accounting for 3.0% of sales.

The new Medium-term Management Plan "DRIVE NTN100" was started in April 2018 under the NTN Group's corporate philosophy "We shall contribute to international society through creating new technologies and developing new

products." In this plan, as an initiative toward the next 100 years, we promote R&D activities through the reinforcement of two areas: core technologies and core products that support our product development, and the development of businesses in new areas.

By developing high-performance and high-precision products fully utilizing our engineering strengths such as tribology, heat treatment, precision processing, precision measurement and CAE, we aim to offer products suitable for the low carbon society, through which we continue to improve customer satisfaction and achieve the sustainable growth of the Company.

### Capital expenditures

For NTN Corporation and its consolidated subsidiaries, the main focus of capital expenditures was on increasing production capacity, labor savings, and rationalization, maintaining and upgrading existing facilities, improving safety, and conducting R&D for new products.

In Japan, capital expenditures totaled 18,261 million yen for capital projects that included expansion of buildings and equipment at Kuwana Works due to heat treatment restructuring as well as additions to bearing production equipment at Okayama Works.

In the Americas, capital expenditures totaled 13,358 million yen on projects that included the expansion of CVJ production equipment at NTK PRECISION AXLE CORP. and the expansion of production equipment for CVJ parts at NTN BOWER CORP.

In Europe, capital expenditures were 9,260 million yen, with projects including the expansion of CVJ production equipment at NTN-SNR ROULEMENTS and NTN TRANSMISSIONS EUROPE.

In Asia and other areas, capital expenditures amounted to 4,844 million yen on projects that included expansion of CVJ production equipment at NTN MANUFACTURING (THAILAND) CO.,LTD.

After adjusting for -552 million yen in equipment transfers between segments, total capital expenditures for the fiscal year were 45,172 million yen.

All expenditures were funded from internal funds and short-term loans. Depreciation and amortization for the fiscal year under review amounted to 38,926 million yen (up 1,420 million yen from the previous fiscal year).

## Financial position and cash flows

Interest-bearing debt increased by 29,511 million yen compared with the end of the preceding fiscal year. Free cash flow came to -22,390 million yen.

Total current assets at March 31, 2019 amounted to 455,280 million yen, a year-on-year increase of 3,555 million yen (or up 0.8%). Major factors included 6,209 million yen increase in finished goods & purchased goods, 5,940 million yen increase in work in process, 3,760 million yen increase in electronically-recorded monetary claims, 2,618 million yen increase in raw materials and supplies, and 14,886 million yen decrease in notes and accounts receivable-trade. Total fixed assets at March 31, 2019 amounted to 385,471 million yen, a year-on-year decrease of 2,231 million yen (or down 0.6%). Major factors included 8,196 million yen decrease in property, plant and equipment, and 6,296 million yen increase in intangible fixed assets. As a result,

total assets amounted to 840,751 million yen, a year-on-year increase of 1,323 million yen (or up 0.2%).

Current liabilities were 289,698 million yen, a year-on-year decrease of 26,728 million yen (or down 8.4%). This was due mainly to 22,501 million yen decrease in short-term loans. Total long-term liabilities amounted to 304,648 million yen, a year-on-year increase of 51,407 million yen (or up 20.3%). This was mainly due to 52,012 million yen increase in long-term loans. As a result, total liabilities amounted to 594,346 million yen, a year-on-year increase of 24,679 million yen (or up 4.3%).

Total net assets were 246,405 million yen, a year-on-year decrease of 23,355 million yen (or down 8.7%). This was mainly due to 15,109 million yen decrease in retained earnings and 4,360 million yen decrease in net unrealized holding gain on other securities.

The equity to capital ratio was 27.4%, down 2.8 percentage points. Total net assets per share, based on the number of shares outstanding over the end of the previous fiscal year, were 433.32 yen per share (a decrease of 43.85 yen per share over the previous fiscal year). Interest-bearing debt amounted to 350,345 million yen, a year-on-year increase of 29,513 million yen (up 9.2%). Factoring in the 25 million yen decrease from effects of exchange-rates, the actual increase was 29,536 million yen. The ratio of interest-bearing debt to total assets was 41.7% (up 3.5 percentage points compared to the end of the previous fiscal year).

Net working capital was 165,582 million yen, an increase of 30,282 million yen from the end of the previous fiscal year. The current ratio was 157.2% (up 14.4 percentage points over the end of the previous fiscal year).

The inventory turnover ratio was 3.77 times (down 0.37 times compared with the end of the previous fiscal year), and the turnover ratio of total assets was 0.87 times (down 0.02 times).

Starting from the beginning of the fiscal year under review, we began to apply Partial Amendments to Accounting Standard for Tax Effect Accounting (ASBJ Statement No. 28, February 16, 2018). Comparisons about financial positions were made using previous fiscal year-end values adjusted retroactively.

Net cash from operating activities was 43,224 million yen (a year-on-year decrease of 18,575 million yen, or down 30.1%). This was mainly due to proceeds of 38,926 million yen from depreciation and amortization.

Net cash from investing activities was 65,614 million yen (a year-on-year increase of 17,255 million yen, or up 35.7%). This was mainly due to expenditures of 42,381 million yen for the purchase of property, plant and equipment, and 10,846 million yen for the purchase of intangible fixed assets.

Net cash from financing activities was 20,746 million (expenditures of 7,521 million yen for the previous fiscal year). This was mainly due to proceeds of 74,297 million yen from long-term loans, proceeds of 13,643 million yen from increase of short-term loans, net and expenditures of 58,360 million yen for repayment of long-term loans and 7,974 million yen in dividend payment.

After including a decrease of 970 million yen in translation adjustments, cash and cash equivalents as of the end of the fiscal year under review totaled 83,474 million yen, representing a decrease of 2,614 million yen (down 3.0%).

Free cash flow, the difference between net cash provided by operating activities and net cash used in investing activities, amounted to -22,390 million yen. The proportion of net cash provided by operating activities to net sales was 5.9%.

## Risk Factors

Business results and the financial position of the NTN Group are subject to the following risks.

### I Economy

The NTN Group operates global production and sales networks, and supplies customers in various industrial sectors. Business results and the financial position of the NTN Group operations may be affected by the economic conditions in specific countries and business conditions in industries to which our customers belong.

### I Foreign Exchange Fluctuations

Overseas sales of the NTN Group account for over 50% of consolidated sales. This percentage is expected to increase further due to continued acceleration in the global business development of the NTN Group.

Overseas subsidiaries' foreign currency-denominated business results and financial positions are converted to yen for the preparation of consolidated financial statements. Moreover, many export transactions with overseas customers of the Company are conducted in foreign currencies. Although the NTN Group hedges risks through forward foreign exchange contracts and expansion of local procurement, effects of exchange rate fluctuations on business results and financial positions cannot be fully eliminated.

### I Declines in Market Prices

The competitive environment surrounding production and sales activities of the NTN Group is becoming harsher worldwide. As products from China and other emerging countries are gaining ground, bearings have been partially affected by falling market prices. At the same time, against a backdrop of global price competition, calls for price reductions are mounting in the automotive industry, which accounts for over half of the NTN Group sales. Although the NTN Group works continuously to reduce costs while developing new products of high quality and high added value, business results and the NTN Group's financial position may be affected by downward pressure on market prices.

### I Rise in Raw Materials Prices

The NTN Group procures a wide range of raw materials from outside sources. To deal with cost increases, especially of steel materials, which pose a high weighting in materials costs, measures have been taken such as mark-ups on selling prices to reflect higher materials cost. In addition, the Group is targeting cost reductions through enhanced production yields and VAVE methods. Nevertheless, business results and the NTN Group's financial position may be affected by stronger than expected increases in raw materials costs.

### I Disasters and Accidents

Production plants and facilities of the NTN Group and its transaction counterparts are exposed to the risk of damage from natural disasters such as earthquakes, floods, and fires. Although the NTN Group has put into place crisis management systems and stands ready to engage in measures to contain damage as much as possible, risks cannot be completely eliminated. Business performance and the financial status of the NTN Group may be affected by a natural disaster or by accidents.

### I Dependence on Specific Industries

The NTN Group's Bearings Division derives approximately half of its sales revenues from the automotive industry, which also accounts for more than half of sales of components that the Constant-velocity Joints Division produces for automotive power transmission to the drive axle. Dependence on the automotive industry is therefore high. Although the NTN Group works to increase sales of bearings and precision equipment products to the industrial machinery sector and implements policies to achieve a balanced sales structure, a rapid shift in demand in the automotive industry could potentially affect the NTN Group's business results and financial position.

### I Product Defects

To ensure product quality, the NTN Group works to satisfy customers' requirements concerning product functions and specifications, and strives to provide appropriate quality and product safety by enforcing quality assurance globally. However, a substantial product defect

leading to a serious accident, claim for damages, or product recall could entail huge product warranty costs and potentially affect business performance and the financial position of the NTN Group. Although the NTN Group has taken out global product liability insurance, complete coverage for loss is not possible.

### I Intellectual Property

The NTN Group generates a wealth of innovative technologies and know-how in the process of new product development, representing valuable intellectual property for which the NTN Group files patent applications to protect its rights. However, business performance and the financial position of the NTN Group may be affected if a legal challenge is initiated against its intellectual property or if its intellectual property is infringed by a third party.

### I Global Operations

The NTN Group develops its business operations worldwide with overseas sales exceeding 50% of consolidated sales. Overseas business development is associated with the following risks:

- Risks from unforeseen change in tax systems of or between individual countries
- Risks from unforeseen change in laws of individual countries
- Difficulty in hiring and retaining appropriate staff
- Evolving technology levels and unstable labor relations in emerging economies
- Political instability in emerging economies

### I Statutory Regulations

The NTN Group is subject to the various laws and regulations (tax laws, environmental laws, occupational safety and health laws, economic statutes such as Antimonopoly laws and anti-dumping laws, trade and exchange laws, and securities trading regulations) of the countries and regions in which it does business.

The NTN Group strives to abide by these laws and regulations and conduct fair business activities. However, if the NTN Group is ever be subject to litigation or involved in legal proceedings because of a violation of a law or regulation, and if the decision of such litigation or legal proceedings goes against the Group, this may have an effect on the business performance or the financial state of the Group. As well, if these laws or regulations change, or if new unforeseen laws or regulations are enacted, these also may have an effect on the business performance or the financial state of the Group.

Some of NTN Group companies are subject to the following actions.

- There are ongoing investigations by the competition authorities into our consolidated subsidiaries in Brazil and elsewhere in relation to overseas sale of bearings, etc.
- The Company and its consolidated subsidiaries in the U.S. and Canada, etc. are defendants in a number of class action suits for suspected price-fixing of bearing sales with other businesses.
- A lawsuit has been filed against the Company and its two consolidated subsidiaries in Europe before the France Tribunal de Commerce de Lyon by Renault S.A. and its group companies, which are 15 in total (hereafter, "Renault"), seeking compensation of 66.7 million euros (provisional amount) for damages. In addition, a lawsuit has been filed against the Company and its two consolidated subsidiaries in Europe before the United Kingdom Commercial Court by Fiat Chrysler Automobiles N.V. and its group companies, which are seven in total (hereafter, "FCA"), seeking compensation for damages.

These lawsuits were filed by Renault and FCA alleging that they suffered damages in connection with the infringement of the European competition laws, which was subject of the decision adopted by the European Commission dated March 19, 2014.

- The NTN Group may be subject to claims for compensation for damages in connection with the violation of competition laws and continue to address these claims. However, it is currently difficult to make reasonable estimates of the future possible effects on the results of operations and financial position of the NTN Group.

## Consolidated Balance Sheet (March 31, 2019)

	Millions of yen		Thousands of U.S. dollars (Note 1)	Millions of yen		Thousands of U.S. dollars (Note 1)
	2019	2018	2019	2019	2018	2019
<b>Assets</b>						
Current assets:						
Cash and cash equivalents (Note 15)	¥ 83,474	¥ 86,088	\$ 754,499			
Short-term investments (Note 15)	6,770	2,595	61,192			
Trade receivables (Note 15):						
Notes	11,356	13,308	102,644			
Accounts	117,450	130,384	1,061,599			
Electronically recorded monetary claims	9,505	5,745	85,913			
Allowance for doubtful accounts	(1,126)	(1,008)	(10,178)			
	137,185	148,429	1,239,978			
Inventories (Note 7)	194,505	179,738	1,758,078			
Other current assets (Note 15)	33,346	34,875	301,406			
Total current assets	455,280	451,725	4,115,153			
Property, plant and equipment, at cost (Note 8):						
Land (Note 2(g))	32,399	32,656	292,846			
Buildings and structures (Note 2(g))	207,862	205,405	1,878,809			
Machinery, equipment and vehicles (Note 2(g))	793,455	795,942	7,171,826			
Construction in progress	30,422	21,580	274,976			
	1,064,138	1,055,583	9,618,457			
Less accumulated depreciation	(784,275)	(767,524)	(7,088,851)			
Property, plant and equipment, net (Note 22)	279,863	288,059	2,529,606			
Investments and other assets:						
Investment securities (Notes 9 and 15)	34,242	40,499	309,504			
Investments in unconsolidated subsidiaries and affiliates (Note 15)	24,949	18,735	225,507			
Deferred income taxes (Note 20)	10,241	11,882	92,566			
Other assets	36,176	28,527	326,986			
Total investments and other assets	105,608	99,643	954,563			
Total assets (Note 22)	¥ 840,751	¥ 839,427	\$7,599,322			
<b>Liabilities and net assets</b>						
Current liabilities:						
Short-term bank loans (Notes 10 and 15)	¥ 71,102	¥ 58,080	\$ 642,672			
Current portion of long-term debt and lease obligations (Notes 10 and 15)	25,530	61,125	230,759			
Trade payables (Note 15):						
Notes	1,601	1,368	14,471			
Accounts	58,370	68,348	527,591			
Electronically recorded obligations	73,188	64,112	661,526			
	133,159	133,828	1,203,588			
Accrued income taxes (Notes 15 and 20)	2,504	3,888	22,633			
Other current liabilities	57,403	59,505	518,850			
Total current liabilities (Note 22)	289,698	316,426	2,618,502			
Long-term liabilities:						
Long-term debt and lease obligations (Notes 10 and 15)	255,925	204,029	2,313,237			
Liability for retirement benefits (Note 11)	41,890	40,393	378,632			
Provision for product defect compensation	1,108	1,492	10,015			
Deferred income taxes (Note 20)	169	208	1,528			
Other long-term liabilities	5,556	7,119	50,219			
Total long-term liabilities (Note 22)	304,648	253,241	2,753,631			
Contingent liabilities (Note 13)						
Net assets:						
Shareholders' equity (Note 12):						
Common stock:						
Authorized – 1,800,000,000 shares	54,347	54,347	491,228			
Issued – 532,463,527 shares in 2019 and 2018						
Capital surplus	67,970	67,970	614,363			
Retained earnings	112,778	127,887	1,019,370			
Treasury stock, at cost: 1,320,628 shares in 2019 and 1,405,959 shares in 2018 (Note 6)	(789)	(816)	(7,132)			
Total shareholders' equity	234,306	249,388	2,117,829			
Accumulated other comprehensive income (loss):						
Net unrealized holding gain on securities (Note 9)	12,020	16,380	108,646			
Translation adjustments	(7,271)	(4,681)	(65,721)			
Retirement benefit liability adjustments (Note 11)	(8,900)	(7,683)	(80,445)			
Total accumulated other comprehensive (loss) income, net	(4,151)	4,016	(37,520)			
Non-controlling interests	16,250	16,356	146,880			
Total net assets	246,405	269,760	2,227,189			
Total liabilities and net assets	¥ 840,751	¥ 839,427	\$7,599,322			

See accompanying notes to the consolidated financial statements.

## Consolidated Statement of Operations (Year ended March 31, 2019)

	Millions of yen		Thousands of U.S. dollars (Note 1)
	2019	2018	2019
Net sales (Note 22)	¥ 733,569	¥ 744,373	\$ 6,630,533
Cost of sales (Note 17)	603,082	603,613	5,451,096
Gross profit	130,487	140,760	1,179,437
Selling, general and administrative expenses (Note 17)	103,541	101,151	935,879
Operating income (Note 22)	26,946	39,609	243,558
Other income (expenses):			
Interest and dividend income	1,965	1,698	17,761
Interest expense	(3,883)	(3,884)	(35,097)
Equity in earnings of affiliates	73	456	660
Foreign exchange loss, net	(3,032)	(1,642)	(27,405)
Loss on surcharge payments under the Anti-Monopoly Act (Note 18)	(2,108)	(3,710)	(19,054)
Loss on impairment of fixed assets (Notes 8 and 22)	(16,963)	(635)	(153,324)
Loss on sales of investments in affiliated company	(221)	–	(1,998)
Other, net	162	(4,986)	1,464
	(24,007)	(12,703)	(216,993)
Profit before income taxes	2,939	26,906	26,565
Income taxes (Note 20):			
Current	5,750	8,056	51,973
Deferred	3,355	(3,439)	30,325
	9,105	4,617	82,298
(Loss) profit	(6,166)	22,289	(55,733)
(Loss) profit attributable to Non-controlling interests	(792)	(1,915)	(7,158)
Owners of parent	¥ (6,958)	¥ 20,374	\$ (62,891)

See accompanying notes to the consolidated financial statements.

## Consolidated Statement of Comprehensive Income (Year ended March 31, 2019)

	Millions of yen		Thousands of U.S. dollars (Note 1)
	2019	2018	2019
(Loss) profit	¥ (6,166)	¥ 22,289	\$ (55,733)
Other comprehensive income (loss) (Note 19):			
Net unrealized holding (loss) gain on securities (Note 9)	(4,360)	2,873	(39,409)
Translation adjustments	(1,841)	5,269	(16,640)
Retirement benefit liability adjustments	(1,265)	1,238	(11,434)
Share of other comprehensive (loss) income of affiliates accounted for by the equity method	(999)	546	(9,030)
Other comprehensive (loss) income, net	(8,465)	9,926	(76,513)
Comprehensive (loss) income	¥ (14,631)	¥ 32,215	\$ (132,246)
Total comprehensive (loss) income attributable to:			
Owners of parent	¥ (15,124)	¥ 29,787	\$ (136,702)
Non-controlling interests	¥ 493	¥ 2,428	\$ 4,456

See accompanying notes to the consolidated financial statements.

## Consolidated Statement of Changes in Net Assets (Year ended March 31, 2019)

	Millions of yen									
	Number of shares in issue	Common stock	Capital surplus	Retained earnings	Treasury stock, at cost	Net unrealized holding gain on securities	Translation adjustments	Retirement benefit liability adjustments	Non-controlling interests	Total net assets
Balance at April 1, 2017	532,463,527	¥54,347	¥66,943	¥114,158	¥(807)	¥13,507	¥(10,006)	¥(8,899)	¥15,807	¥245,050
Cash dividends paid	–	–	–	(6,645)	–	–	–	–	–	(6,645)
Profit attributable to owners of parent	–	–	–	20,374	–	–	–	–	–	20,374
Purchases of treasury stock	–	–	–	–	(9)	–	–	–	–	(9)
Sales of treasury stock	–	–	–	–	0	–	–	–	–	0
Change in equity resulting from transactions with non-controlling interests	–	–	1,027	–	–	–	–	–	–	1,027
Other changes	–	–	–	–	–	2,873	5,325	1,216	549	9,963
Balance at April 1, 2018	532,463,527	54,347	67,970	127,887	(816)	16,380	(4,681)	(7,683)	16,356	269,760
Cumulative effect of change in accounting principle (Note 3)	–	–	–	(177)	–	–	–	–	–	(177)
Restated balance at April 1, 2018	532,463,527	54,347	67,970	127,710	(816)	16,380	(4,681)	(7,683)	16,356	269,583
Cash dividends paid	–	–	–	(7,974)	–	–	–	–	–	(7,974)
Loss attributable to owners of parent	–	–	–	(6,958)	–	–	–	–	–	(6,958)
Purchases of treasury stock	–	–	–	–	(1)	–	–	–	–	(1)
Sales of treasury stock	–	–	–	–	28	–	–	–	–	28
Other changes	–	–	–	–	–	(4,360)	(2,590)	(1,217)	(106)	(8,273)
Balance at March 31, 2019	532,463,527	¥54,347	¥67,970	¥112,778	¥(789)	¥12,020	¥(7,271)	¥(8,900)	¥16,250	¥246,405

Thousands of U.S. dollars (Note 1)

	Thousands of U.S. dollars (Note 1)									
	Common stock	Capital surplus	Retained earnings	Treasury stock, at cost	Net unrealized holding gain on securities	Translation adjustments	Retirement benefit liability adjustments	Non-controlling interests	Total net assets	
Balance at April 1, 2018	\$491,228	\$614,363	\$1,155,936	\$(7,376)	\$148,055	\$(42,311)	\$(69,445)	\$147,837	\$2,438,287	
Cumulative effect of change in accounting principle (Note 3)	–	–	(1,600)	–	–	–	–	–	(1,600)	
Restated balance at April 1, 2018	491,228	614,363	1,154,336	(7,376)	148,055	(42,311)	(69,445)	147,837	2,436,687	
Cash dividends paid	–	–	(72,075)	–	–	–	–	–	(72,075)	
Loss attributable to owners of parent	–	–	(62,891)	–	–	–	–	–	(62,891)	
Purchases of treasury stock	–	–	–	(9)	–	–	–	–	(9)	
Sales of treasury stock	–	–	–	253	–	–	–	–	253	
Other changes	–	–	–	–	(39,409)	(23,410)	(11,000)	(957)	(74,776)	
Balance at March 31, 2019	\$491,228	\$614,363	\$1,019,370	\$(7,132)	\$108,646	\$(65,721)	\$(80,445)	\$146,880	\$2,227,189	

See accompanying notes to the consolidated financial statements.

## Consolidated Statement of Cash Flows (Year ended March 31, 2019)

	Millions of yen		Thousands of U.S. dollars (Note 1)
	2019	2018	2019
<b>Cash flows from operating activities:</b>			
Profit before income taxes	¥ 2,939	¥ 26,906	\$ 26,565
Adjustments for:			
Depreciation and amortization	38,926	37,506	351,842
Loss on impairment of fixed assets	16,963	635	153,324
Loss on surcharge payments under the Anti-Monopoly Act	2,108	3,710	19,054
Loss on sales of investments in affiliated company	221	–	1,998
Decrease in provision for loss on support to a related company	–	(2,154)	–
Increase in allowance for doubtful accounts	157	64	1,419
(Decrease) increase in provision for directors' and audit & supervisory board members' bonuses	(15)	26	(136)
(Decrease) increase in provision for product defect compensation	(401)	1,109	(3,625)
Increase (decrease) in liability for retirement benefits	600	(1,045)	5,423
Interest and dividend income	(1,965)	(1,698)	(17,761)
Interest expense	3,883	3,884	35,097
Translation adjustments and foreign exchange loss, net	1,363	28	12,320
Equity in earnings of affiliates	(73)	(456)	(660)
Decrease (increase) in trade receivables	10,534	(4,459)	95,214
Increase in inventories	(16,184)	(5,791)	(146,283)
Increase in trade payables	198	14,840	1,790
Other	466	5,616	4,212
Subtotal	59,720	78,721	539,793
Interest and dividend income received	2,471	2,079	22,335
Interest paid	(3,893)	(3,969)	(35,188)
Surcharge payments under the Anti-Monopoly Act	(6,399)	(10,237)	(57,839)
Income taxes paid	(8,675)	(4,795)	(78,411)
Net cash provided by operating activities	¥ 43,224	¥ 61,799	\$ 390,690
<b>Cash flows from investing activities:</b>			
Increase in short-term investments, net	¥ (4,265)	¥ (1,874)	\$ (38,550)
Purchases of property, plant and equipment	(42,381)	(36,458)	(383,070)
Purchases of other assets	(10,846)	(9,645)	(98,034)
Purchase of investments in affiliated company	(9,180)	–	(82,976)
Proceeds from sales of investments in affiliated company	1,145	–	10,349
Other	(87)	(382)	(786)
Net cash used in investing activities	¥ (65,614)	¥ (48,359)	\$ (593,067)
<b>Cash flows from financing activities:</b>			
Increase (decrease) in short-term bank loans, net	¥ 13,643	¥ (10,030)	\$ 123,315
Proceeds from long-term debt	74,297	68,998	671,551
Repayment of long-term debt, including current portion	(58,360)	(68,858)	(527,500)
Proceeds from issuance of corporate bonds	–	10,000	–
Cash dividends paid	(7,974)	(6,645)	(72,075)
Repayment of lease obligations	(287)	(348)	(2,594)
Other	(573)	(638)	(5,179)
Net cash provided by (used in) financing activities	¥ 20,746	¥ (7,521)	\$ 187,518
Effect of exchange rate changes on cash and cash equivalents	(970)	885	(8,768)
Net (decrease) increase in cash and cash equivalents	(2,614)	6,804	(23,627)
Cash and cash equivalents at beginning of the year	86,088	79,284	778,126
Cash and cash equivalents at end of the year	¥ 83,474	¥ 86,088	\$ 754,499

See accompanying notes to the consolidated financial statements.

## Notes to Consolidated Financial Statements (March 31, 2019)

### 1. Basis of Preparation

The accompanying consolidated financial statements of NTN Corporation (the "Company") and consolidated subsidiaries are prepared on the basis of accounting principles generally accepted in Japan, which are different in certain respects as to the application and disclosure requirements of International Financial Reporting Standards, and are compiled from the consolidated financial statements prepared by the Company as required by the Financial Instruments and Exchange Act of Japan.

In preparing the accompanying consolidated financial statements, certain reclassifications have been made to the consolidated financial statements issued domestically in order to present them in a format which is more familiar to readers outside Japan. In addition, certain notes included herein are not required under accounting principles generally accepted in Japan but are presented as additional information.

Certain amounts in the prior year's financial statements have been reclassified to conform to the current year's presentation. Such reclassification had no effect on consolidated profit or net assets.

The translation of yen amounts into U.S. dollar amounts is included solely for the convenience of readers outside Japan and has been made at ¥110.635 = U.S. \$1.00, the exchange rate prevailing on March 31, 2019. This translation should not be construed as a representation that yen can be converted into U.S. dollars at the above or any other rate.

### 2. Summary of Significant Accounting Policies

#### (a) Principles of consolidation

The accompanying consolidated financial statements include the accounts of the Company and the significant companies which it controls directly or indirectly. Companies over which the Company exercises significant influence in terms of their operating and financial policies have been included in the accompanying consolidated financial statements on an equity basis.

The financial statements of certain consolidated subsidiaries whose fiscal year end is December 31 have been included in consolidation on the basis of a full fiscal year closing on March 31 for consolidation purposes.

#### (b) Foreign currency translation

Monetary assets and liabilities denominated in foreign currencies are translated into yen at the rates of exchange in effect at the balance sheet date. Revenues and expenses are translated at the rates of exchange prevailing when the transactions were made.

Assets and liabilities of overseas consolidated subsidiaries are translated into yen at the exchange rates in effect at the respective balance sheet dates, except for the components of net assets excluding non-controlling interests which are translated at the respective historical rates. Revenue and expenses are translated at the average rates of exchange for the respective years. Differences arising from translation are reflected in "Translation adjustments" and "Non-controlling interests" in the accompanying consolidated balance sheet and statement of changes in net assets.

#### (c) Cash and cash equivalents

Cash and cash equivalents consist of cash on hand, deposits with banks withdrawable on demand, and short-term investments which are readily convertible to cash subject to an insignificant risk of any change in their value and which were purchased with an original maturity of three months or less.

#### (d) Allowance for doubtful accounts

The allowance for doubtful accounts is computed based on the actual historical percentage of bad debts and an estimate of uncollectible amounts determined after an analysis of specific individual receivables.

#### (e) Short-term investments and investment securities

The accounting standard for financial instruments requires that securities be classified into three categories: trading, held-to-maturity or other securities. Trading securities are carried at fair value and held-to-maturity debt securities are carried at amortized cost. Marketable securities classified as other securities are carried at fair value with any changes in unrealized holding gain or loss, net of the applicable income taxes, included directly in net assets. Cost of securities sold is determined by the moving average method. Non-marketable securities classified as other securities are carried at cost based on the moving average method.

#### (f) Inventories

Inventories are principally stated at lower of cost, determined by the average method, or net selling value.

#### (g) Property, plant and equipment (other than leased assets)

Property, plant and equipment are stated at cost. The Company and its domestic consolidated subsidiaries calculate depreciation by the straight-line method over the estimated useful lives of the respective assets. The foreign consolidated subsidiaries principally calculated depreciation by the straight-line method over the estimated useful lives of the respective assets.

The principal estimated useful lives are as follows:

Buildings and structures	10 to 50 years
Machinery, equipment and vehicles	5 to 12 years

Contributions granted by national and municipal governments are deducted directly from the acquisition costs of the related fixed assets as stipulated in the Corporation Tax Law of Japan. The property, plant and equipment accounts on the consolidated balance sheet at March 31, 2019 and 2018 were reduced by the following amounts:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Land	¥ 799	¥ 799	\$ 7,222
Buildings and structures	410	372	3,706
Machinery, equipment and vehicles	92	119	831
	¥ 1,301	¥ 1,290	\$ 11,759

#### (h) Liability for retirement benefits

Liability for retirement benefits has been provided principally at an amount calculated based on the retirement benefit obligation after the fair value of the pension plan assets are deducted. The estimated benefit is attributed to each period by the benefit formula method over the estimated years of service of the eligible employees.

Past service cost is amortized as incurred primarily by the straight-line method over a period of principally 15 years, which is within the estimated average remaining years of service of the eligible employees.

Net unrecognized actuarial gain or loss is amortized commencing in the year following the year in which the gain or loss was recognized primarily by the straight-line method over a period of principally 15 years, which is within the estimated average remaining years of service of the eligible employees.

**(i) Provision for product defect compensation**

Provision for product defect compensation is provided at an estimated amount in order to cover the anticipated compensation.

**(j) Leases**

For lease transactions involving the transfer of ownership, the leased assets are depreciated by the same methods used for owned fixed assets.

For lease transactions not involving the transfer of ownership, leased assets are depreciated over the lease period using the straight-line method with a nil residual value.

**(k) Research and development costs and computer software**

Research and development costs are charged to income as incurred.

Expenditures relating to computer software developed for internal use are charged to income when incurred, except if the software is expected to contribute to the generation of income or to future cost savings. Such expenditures are capitalized as assets and are amortized by the straight-line method over their respective estimated useful lives, generally a 5-year period.

**(l) Deferred income taxes**

Deferred income taxes are provided for temporary differences between the balances of assets and liabilities reported for financial reporting purposes and the corresponding balances for tax reporting purposes.

**(m) Derivative financial instruments and hedging activities**

All derivatives are stated at fair value with any changes in fair value included in profit for the period in which they arise, except for derivatives which meet the criteria for deferral hedge accounting under which unrealized gain or loss, net of the applicable income taxes, is deferred as a component of net assets. Receivables and payables hedged by forward foreign exchange contracts which meet certain conditions are translated at the corresponding foreign exchange contract rates. Interest-rate swaps which meet certain conditions are accounted for as if the interest rates applied to the interest-rate swaps had originally applied to the underlying debt.

Interest-rate and cross currency swaps which meet certain conditions are accounted for as if the interest rates and currencies applied to the interest-rate and cross currency swaps had originally applied to the underlying debt.

**(n) Distribution of retained earnings**

Under the Corporation Law of Japan and the Company's Articles of Incorporation, the distribution of retained earnings with respect to a given financial period is made by resolution of the shareholders at a general meeting held subsequent to the close of the financial period. The distribution of retained earnings with respect to the interim financial period is made by resolution of the Board of Directors. The accounts for the period do not reflect such distributions.

**(o) Consolidated taxation system**

The Company and certain domestic consolidated subsidiaries adopted the consolidated taxation system, which allows companies to file tax returns based on the combined profits or losses of the parent company and its wholly owned domestic subsidiaries.

**3. Accounting Changes****Application of IFRS 15**

A number of the Company's overseas consolidated subsidiaries have applied IFRS 15, "Revenue from Contracts with Customers," effective

from April 1, 2018. The cumulative effect of applying IFRS 15 was recognized by adjusting the beginning balance of retained earnings the fiscal year ended March 31, 2019, in accordance with the transitional treatment provided in this standard. In addition, the effects of applying IFRS 15 on the consolidated financial statements were immaterial.

**4. Standards Issued but Not Yet Effective****Accounting Standard and Implementation Guidance for Revenue Recognition****(i) Overview**

On March 30, 2018, the Accounting Standards Board of Japan (here in after referred to as the "ASBJ") issued "Accounting Standard for Revenue Recognition" (ASBJ Statement No.29) and "Implementation Guidance on Accounting Standard for Revenue Recognition" (ASBJ Guidance No.30). The International Accounting Standards Board (hereinafter referred to as the "IASB") and the Financial Accounting Standards Board (hereinafter referred to as the "FASB") in the United States co-developed comprehensive accounting standards for revenue recognition and issued "Revenue from Contracts with Customers" (issued as IFRS 15 by the IASB and Topic 606 by the FASB) in May 2014. The ASBJ developed comprehensive accounting standards on revenue recognition and issued them in conjunction with the implementation guidance based on the fact that IFRS 15 was applied from fiscal years started on or after January 1, 2018 and Topic 606 was applied from fiscal years started after December 15, 2017.

As the basic policy in developing accounting standards for revenue recognition, the ASBJ defined the accounting standard starting with incorporating the basic principle of IFRS 15 from a standpoint of comparability between financial statements, which is one benefit of ensuring consistency with IFRS 15. Furthermore, the ASBJ added alternative accounting treatment without impairing comparability when there are matters to be considered related to accounting practices, etc. common in Japan.

**(ii) Scheduled date of adoption**

The Company expects to adopt the accounting standard and implementation guidance from the beginning of the fiscal year ending March 31, 2022.

**(iii) Impact of the adoption of accounting standard and implementation guidance**

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

**5. Change in Presentation****Partial Amendment 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) (hereinafter, the "Partial Amendments") from the beginning of the fiscal year ended March 31, 2019. As such, deferred tax assets and deferred tax liabilities are included within investments and other assets and long-term liabilities, respectively, and related income tax disclosures have been expanded.

As a result, ¥8,377 million of deferred tax assets in current assets and ¥86 million of deferred tax liabilities in current liabilities previously presented in consolidated balance sheet as of March 31, 2018 have been reclassified and included with ¥8,377 million of deferred tax assets

in investments and other assets and ¥86 million of deferred tax liabilities in long-term liabilities, respectively.

Also, Note 20 "Income Taxes" in the Notes to the consolidated financial statements has been expanded in accordance with Note 8 and Note 9 and Interpretive Note to Accounting for Tax Effect Accounting. However, comparative information for the year ended March 31, 2018 has not been disclosed in Note 20 in accordance with the transitional provisions set forth in Article 7 of the Partial Amendments.

**6. Additional Information****Performance-linked stock compensation scheme**

The Company introduced a performance-linked stock compensation scheme (hereinafter referred to as the "Scheme") for its directors (excluding directors who do not reside in Japan and outside directors; the same applies hereinafter), which serves as an officer remuneration system that is closely linked to corporate performance targets in the mid-term management plan and which is highly transparent and objective in nature.

**7. Inventories**

Inventories at March 31, 2019 and 2018 consisted of the following:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Finished goods	¥ 102,677	¥ 96,468	\$ 928,070
Work in process	55,419	49,479	500,917
Raw materials and supplies	36,409	33,791	329,091
	¥ 194,505	¥ 179,738	\$ 1,758,078

**8. Impairment of Fixed Assets**

The Company and its consolidated subsidiaries group fixed assets used for manufacturing by management segment into minimum units which generate identifiable cash flows (e.g., a factory). They also group fixed assets used at the head office or used for sales activities as shared assets, and group fixed assets on an individual basis when they do not expect any future use.

The Company and its consolidated subsidiaries wrote down the following assets to their respective net recoverable values because the Company and its consolidated subsidiaries do not expect them to be recoverable. Consequently, the Company and its consolidated subsidiaries recorded related losses on impairment of fixed assets of ¥16,963 million (\$153,324 thousand) and ¥635 million in the accompanying consolidated statement of operations for the years ended March 31, 2019 and 2018, respectively:

Location	Usage	Classification	Millions of yen		Thousands of U.S. dollars
			2019	2018	2019
Japan	Production equipment and other	Buildings and structures	¥ 3,114	¥ -	\$ 28,147
		Machinery and equipment	12,851	15	116,157
		Land	489	448	4,420
		Construction in progress	167	65	1,509
	Welfare facilities	Other	342	-	3,091
		Buildings and structures	-	107	-
		Machinery and equipment	-	0	-
			¥ 16,963	¥ 635	\$ 153,324

The recoverable value of the fixed assets presented in the above table has been measured primarily at net realizable value or value in use. If a fixed asset is unlikely to be sold or diverted to other usage, such asset is valued at nil. Value in use is measured as the sum of anticipated future cash flows by each business units discounted at rate of 6% for the year ended March 31, 2019.

**(i) Overview of transactions**

The Scheme adopts a mechanism known as an officer remuneration BIP (Board Incentive Plan) trust (hereinafter referred to as the "BIP Trust"). The BIP Trust is an incentive plan for officers based on the performance share scheme and the restricted stock scheme in the U.S., and has a system in which the Company's shares acquired by the BIP Trust and funds equivalent to the proceeds received when converting into cash or disposing of such shares are distributed and paid according to the officers' positions and the degree of achievement of performance targets disclosed in the mid-term management plan, and other factors.

**(ii) The Company's shares remaining in the trust**

The Company's shares remaining in the trust are recorded as treasury stock in the net asset section, based on their book value (excluding the amount of incidental expenses) recorded in the accounts of the trust. The book value and number of shares of such treasury stock at March 31, 2019 totaled ¥152 million (\$1,374 thousand) and 479,761 shares, and at March 31, 2018 totaled ¥180 million and 566,826 shares, respectively.

## 9. Securities

(a) Information regarding marketable securities classified as other securities at March 31, 2019 and 2018 is summarized as follows:

	Millions of yen					
	2019			2018		
	Carrying value	Acquisition costs	Unrealized gain (loss)	Carrying value	Acquisition costs	Unrealized gain (loss)
Securities whose carrying value exceeds their acquisition costs:						
Equity securities	¥ 29,866	¥ 11,798	¥ 18,068	¥ 36,636	¥ 13,038	¥ 23,598
Securities whose carrying value does not exceed their acquisition costs:						
Equity securities	4,088	4,999	(911)	3,574	3,759	(185)
<b>Total</b>	<b>¥ 33,954</b>	<b>¥ 16,797</b>	<b>¥ 17,157</b>	<b>¥ 40,210</b>	<b>¥ 16,797</b>	<b>¥ 23,413</b>

	Thousands of U.S. dollars		
	2019		
	Carrying value	Acquisition costs	Unrealized gain (loss)
Securities whose carrying value exceeds their acquisition costs:			
Equity securities	\$ 269,951	\$ 106,639	\$ 163,312
Securities whose carrying value does not exceed their acquisition costs:			
Equity securities	36,950	45,185	(8,235)
<b>Total</b>	<b>\$ 306,901</b>	<b>\$ 151,824</b>	<b>\$ 155,077</b>

(b) Sales and aggregate gain on investment securities are summarized as follows:

There were no sales of investment securities for the years ended March 31, 2019 and 2018.

## 10. Short-Term Bank Loans, Long-Term Debt and Lease Obligations

Short-term bank loans principally represent short-term notes with average annual interest rates of 1.54% and 1.12% at March 31, 2019 and 2018, respectively.

Long-term debt and lease obligations at March 31, 2019 and 2018 consisted of the following:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Loans from banks and other financial institutions, due through 2026, at an average annual interest rate of 1.54%	¥ 249,243	¥ 232,753	\$ 2,252,841
0.405% unsecured bonds due 2025	10,000	10,000	90,387
0.490% unsecured bonds due 2027	10,000	10,000	90,387
0.430% unsecured bonds due 2028	10,000	10,000	90,387
Lease obligations due through 2046	2,212	2,401	19,994
	<b>281,455</b>	<b>265,154</b>	<b>2,543,996</b>
Less current portion	(25,530)	(61,125)	(230,759)
	<b>¥ 255,925</b>	<b>¥ 204,029</b>	<b>\$ 2,313,237</b>

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

Year ending March 31,	Millions of yen	Thousands of U.S. dollars
2020	¥ 25,530	\$ 230,759
2021	40,257	363,871
2022	49,874	450,798
2023	48,735	440,503
2024	36,614	330,944
2025 and thereafter	80,445	727,121
	<b>¥ 281,455</b>	<b>\$ 2,543,996</b>

## 11. Retirement Benefits

## 1. Outline of retirement benefits for employees

The Company and certain domestic consolidated subsidiaries have defined benefit pension plans (i.e., corporate pension fund plans and lump-sum payment plans), covering substantially all employees who are entitled to lump-sum or annuity payments, the amounts of which are determined by reference to their basic rates of pay, length of service, and the conditions under which termination occurs. They also have defined contribution pension plans and advance payment plans. Certain overseas consolidated subsidiaries have defined benefit pension plans and/or defined contribution pension plans. The Company has also established an employees' retirement benefit trust.

## 2. Defined benefit pension plans

(1) The changes in the retirement benefit obligation for the years ended March 31, 2019 and 2018 are as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Retirement benefit obligation at the beginning of the year	¥ 102,839	¥ 103,637	\$ 929,534
Service cost	3,380	3,439	30,551
Interest cost	1,799	1,838	16,261
Actuarial gain	(407)	(538)	(3,679)
Benefits paid	(5,131)	(5,809)	(46,378)
Other	(39)	272	(352)
Retirement benefit obligation at the end of the year	<b>¥ 102,441</b>	<b>¥ 102,839</b>	<b>\$ 102,839</b>

\*Certain domestic consolidated subsidiaries calculate the liability for retirement benefits based on the simplified method.

(2) The changes in plan assets for the years ended March 31, 2019 and 2018 are as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Plan assets at fair value at the beginning of the year	¥ 62,446	¥ 61,488	\$ 564,433
Expected return on plan assets	1,463	1,676	13,224
Actuarial gain or loss	(2,575)	1,122	(23,275)
Contributions by the employers	3,716	2,687	33,588
Benefits paid	(4,310)	(3,775)	(38,957)
Other	(189)	(752)	(1,708)
Plan assets at fair value at the end of the year	<b>¥ 60,551</b>	<b>¥ 62,446</b>	<b>\$ 547,305</b>

(3)The balance of retirement benefit obligation and plan assets at fair value, liabilities and assets recognized in consolidated balance sheets as of March 31, 2019 and 2018 are as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Funded retirement benefit obligation	¥ 96,191	¥ 93,915	\$ 869,445
Plan assets at fair value	(60,551)	(62,446)	(547,305)
	35,640	31,469	322,140
Unfunded retirement benefit obligation	6,250	8,924	56,492
Net amount of liabilities and assets recognized in the consolidated balance sheet	41,890	40,393	378,632
Liability for retirement benefits	41,890	40,393	378,632
Net amount of liabilities and assets recognized in the consolidated balance sheet	¥ 41,890	¥ 40,393	\$ 378,632

(4)The components of retirement benefit expenses for the years ended March 31, 2019 and 2018 are as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Service cost	¥ 3,380	¥ 3,439	\$ 30,551
Interest cost	1,799	1,838	16,261
Expected return on plan assets	(1,463)	(1,676)	(13,224)
Amortization:			
Actuarial loss	352	1,710	3,182
Past service cost	35	8	316
Retirement benefit expenses	¥ 4,103	¥ 5,319	\$ 37,086

(5)The components of retirement benefit liability adjustments included in other comprehensive income (before tax effect) for the years ended March 31, 2019 and 2018 are as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Actuarial gain or loss	¥ (1,817)	¥ 3,370	\$ (16,423)
Past service cost	24	23	217
Total	¥ (1,793)	¥ 3,393	\$ (16,206)

(6)The components of retirement benefit liability adjustments included in accumulated other comprehensive income (before tax effect) as of March 31, 2019 and 2018 are as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Unrecognized actuarial loss	¥ (9,934)	¥ (8,117)	\$ (89,791)
Unrecognized past service cost	(233)	(257)	(2,106)
Total	¥ (10,167)	¥ (8,374)	\$ (91,897)

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

	2019	2018
Equities	38.4%	45.2%
Bonds	33.9	29.2
General accounts at life insurance companies	16.1	15.2
Other	11.6	10.4
Total	100.0%	100.0%

The expected long-term rate of return on plan assets is determined as a result of consideration of both the portfolio allocation at present and anticipated in the future, and long-term expected rate of return from multiple plan assets.

(8)The assumptions used in accounting for the defined benefit plans are as follows:

	2019	2018
Discount rate	Principally 1.2%	Principally 1.2%
Expected long-term rate of return on plan assets	Principally 1.5%	Principally 2.5%

### 3. Defined contribution pension plans

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Contributions to defined contribution pension plans	¥ 1,670	¥ 1,622	\$ 15,095

## 12. Shareholders' Equity

(a)The Corporation Law of Japan (the "Law") 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 legal reserve) be transferred to the capital reserve and the legal reserve, respectively, until the sum of the capital reserve and the legal reserve equals 25% of the capital stock account. Such distributions can be made at any time by resolution of the shareholders or by the Board of Directors if certain conditions are met.

Retained earnings include the legal reserve provided in accordance with the provisions of the Law. The legal reserve of the Company included in retained earnings amounted to ¥8,639 million (\$78,086 thousand) at March 31, 2019 and 2018.

(b)Movements in shares issued and treasury stock during the years ended March 31, 2019 and 2018 are summarized as follows:

	Number of shares			
	2019			
	April 1, 2018	Increase	Decrease	March 31, 2019
Shares issued:Common stock	532,463,527	–	–	532,463,527
Treasury stock:Common stock	1,405,959	1,829	87,160	1,320,628
	2018			
	April 1, 2018	Increase	Decrease	March 31, 2019
	532,463,527	–	–	532,463,527
Treasury stock:Common stock	1,388,394	18,767	1,202	1,405,959

The increase in treasury stock of 1,829 shares was due to purchases of shares of less than one voting unit and the decrease in treasury stock of 87,160 shares was mainly due to disposal of shares by the "Officer Remuneration BIP Trust" for the year ended March 31, 2019 (Please refer to Note 6).

Additionally, the Company included 479,761 shares held by the "Officer Remuneration BIP Trust" in the number of treasury stock at March 31, 2019.

The increase in treasury stock of 18,767 shares was due to purchases of shares of less than one voting unit and the decrease in treasury stock of 1,202 shares was mainly due to disposal of shares by the "Officer Remuneration BIP Trust" for the year ended March 31, 2018 (Please refer to Note 6). Additionally, the Company included 566,826 shares held by the "Officer Remuneration BIP Trust" in the number of treasury stock at March 31, 2018.



### 13. Contingent Liabilities

#### Lawsuits, etc.

- (1) There are ongoing investigations by the authorities into consolidated subsidiaries in Brazil and elsewhere on suspicion of violating competition laws of each country in connection with overseas sales of bearings.
- (2) In the U.S. and Canada, a number of class action suits was filed against the Company and its consolidated subsidiaries for suspected price-fixing of bearing sales with business competitors.
- (3) In Europe, a lawsuit has been filed against the Company and its two consolidated subsidiaries in the France Tribunal de Commerce de Lyon. The suit seeks the payment of damages of €66.7 million (provisional amount) to Renault S.A. and its total 15 group companies (hereinafter referred to as "Renault"). In addition, another lawsuit has been filed against the Company and its two consolidated subsidiaries in Europe in the United Kingdom Commercial Court by Fiat Chrysler Automobiles N.V. and its total 7 group companies (hereinafter referred to as "FCA").

### 14. Operating Leases

Future minimum lease payments subsequent to March 31, 2019 for non-cancelable operating leases were as follows:

Years ending March 31	Millions of yen	Thousands of U.S. dollars
2020	¥ 1,472	\$ 13,305
2021 and thereafter	4,334	39,174
Total	¥ 5,806	\$ 252,479

These suits have been filed because Renault and FCA claimed damages incurred in connection with the alleged violation of the European Competition Law, which is the subject of a decision made by the European Commission on March 19, 2014.

- (4) The Company and its related companies may be subject to claims for compensation for damages in connection with the past violation of the Anti-Monopoly Act of Japan or the European Competition Law, etc. and continue to address these claims. Depending on the results of the claims, the results of operations of the Company and its consolidated subsidiaries could be affected. However, it is currently difficult to make reasonable estimates of the future possible effects on the results of operations and financial position of the Company and its consolidated subsidiaries.

### 15. Financial Instruments

#### Overview

##### (a) Policy for financial instruments

The Company and its subsidiaries (collectively, the "Group") raise necessary funds in accordance with management plans mainly by bank borrowings and issuance of corporate bonds in support of operations related to the manufacture and sales of bearings, constant-velocity joints (CVJs) and precision equipments. The Group utilizes bank borrowings for short-term operating funds, and bank borrowings and issuance of corporate bonds for long-term capital investments and finances. Temporary surplus funds are managed by low-risk financial assets. The Group utilizes derivatives to avoid or mitigate risks as described in the later part of this note and does not hold them for speculative purposes.

##### (b) Types of financial instruments and related risks

Trade receivables, notes, accounts receivable and electronically recorded monetary claims, are exposed to credit risk of customers. In addition, as a result of the business of the Group, which operates globally, foreign currency trade receivables are exposed to currency rate fluctuation risk, which is mitigated by utilizing forward foreign currency exchange contracts. Securities are mainly composed of stocks of the companies with which the Group has business relationships and they are exposed to fluctuation risk of market prices.

Trade payables, notes, accounts payable and electronically recorded obligations, are due within one year. Certain trade payables resulting from the import of raw materials are denominated in foreign currencies. These are exposed to fluctuation risk of foreign currencies. However, the risk is mitigated because the trade payables, notes and accounts payable denominated in foreign currencies are within persistently the range of accounts receivable denominated in the same currencies.

Loans are mainly utilized for business operations of the Group. Short-term loans are mainly utilized for financing of operating activities. Long-term loans are mainly utilized for capital investments and financing. These have maturity dates of 10 years or less, at the longest, subsequent to March 31, 2019. Certain loans are exposed to fluctuation risk of interest rates and fluctuation risk of exchange rates and this risk is hedged by derivative transactions of interest rate swap agreements and interest-rate and cross currency swap agreements.

The Group has a policy to utilize derivative transactions involving forward foreign currency exchange contracts, currency option agreements, currency swap agreements, interest rate option agreements and interest rate swap agreements for the purpose of avoiding future fluctuation risk of foreign currencies trade receivables and payables and mitigating future fluctuation risk of interest rate of loans and corporate bonds. The Group utilized forward foreign currency exchange contracts, interest rate swap agreements and interest-rate and cross currency swap agreements for the year ended March 31, 2019. Refer to "(m) Derivative financial instruments and hedging activities" in Note 2 "Summary of Significant Accounting Policies."

#### (c) Risk management for financial instruments

(i) Monitoring of credit risk (the risk that customers or counterparties may default)

In accordance with internal rules and manual, the credit management section periodically monitors financial conditions of major customers, manages collection due dates and balances of each customer and tries to identify credit risk of customers with worsening financial conditions at the early stage and mitigate the risk. Credit risk of securities is quite low because the Group utilizes certificate of deposits with high credit ratings, up to a limited amount, which is approved by the Company. The Group believes credit risk of derivative transactions is almost nil because counterparties are financial institutions with high credit ratings.

(ii) Monitoring of market risks (the risks arising from fluctuations in foreign currency exchange rates, interest rates and others)

The Group mainly utilizes forward foreign currency exchange contracts for hedging of fluctuation risk which is identified by each currency. Depending on the market conditions of foreign currencies, the Group utilizes forward foreign currency exchange contracts for forecasted export transactions with a maximum period of 6 months.

The Group utilizes interest rate swap agreements and interest-rate and cross currency swap agreements to mitigate fluctuation risk of interest rates and fluctuation risk of loan principal due to floating exchange rates.

The Group continuously reviews securities holdings by monitoring periodically the market value and financial condition of securities' issuers (companies with business relationships with the Group) and by evaluating those relationships.

The Group has established policies which include maximum upper limits and reporting obligations for derivative transactions and complies fully with these guidelines. Derivative transactions are entered into by the Company's Accounting Department and certain consolidated subsidiaries. The Company carries out mutual supervision and monitoring of the derivative transactions in accordance with management policies and its consolidated subsidiaries apply the same approach. Each derivative transaction of the Company is reported to the responsible director when entered into. The consolidated subsidiaries are required to report the status of their derivatives transactions to the Company on a monthly basis and are also required to consult with the Company when they enter into derivative transactions other than forward foreign currency exchange contracts.

(iii) Monitoring of liquidity risk (the risk that the Group may not be able to meet its obligations on scheduled due dates)

The Group manages liquidity risk with the responsible section preparing and updating cash flow plans and keeping necessary funds based on reports of each section.

#### (d) Supplementary explanation of the fair value of financial instruments

The fair value of financial instruments is based on their quoted market price, if available. When there is no quoted market price available, fair value is reasonably estimated. Since various assumptions and factors are reflected in estimating the fair value, different assumptions and factors could result in different fair value. In addition, the notional amounts of derivatives in Note 16 "Derivative Financial Instruments and Hedging Activities" are not necessarily indicative of the actual market risk involved in the derivative transactions.

## Fair Value of Financial Instruments

The carrying value of financial instruments on the consolidated balance sheets, fair value and the difference as of March 31, 2019 and 2018, are shown in the following table. The table does not include financial instruments for which it is extremely difficult to determine the fair value. (Please refer to Note 2 below).

	Millions of yen					
	2019			2018		
	Carrying value	Fair value	Difference	Carrying value	Fair value	Difference
(1)Cash and cash equivalents	¥ 83,474	¥ 83,474	¥ -	¥ 86,088	¥ 86,088	¥ -
(2)Short-term investments	6,770	6,770	-	2,595	2,595	-
(3)Notes and accounts – trade receivables	128,806	128,806	-	143,692	143,692	-
(4)Electronically recorded monetary claims	9,505	9,505	-	5,745	5,745	-
(5)Investment securities	33,954	33,958	4	40,210	40,213	3
(6)Short-term loans receivable included in other current assets	71	71	-	77	77	-
Total assets	¥ 262,580	¥ 262,584	¥ 4	¥ 278,407	¥ 278,410	¥ 3
(7)Short-term bank loans	71,102	71,102	-	58,080	58,080	-
(8)Current portion of long-term debt	25,330	25,330	-	60,853	60,853	-
(9)Notes and accounts – trade payables	59,971	59,971	-	69,716	69,716	-
(10)Electronically recorded obligations	73,188	73,188	-	64,112	64,112	-
(11)Accrued income taxes	2,504	2,504	-	3,888	3,888	-
(12)Long-term debt	253,912	256,307	2,395	201,900	202,080	180
Total liabilities	¥ 486,007	¥ 488,402	¥ 2,395	¥ 458,549	¥ 458,729	¥ 180
Derivative transactions (*)	¥ 896	¥ 896	¥ -	¥ 636	¥ 636	¥ -

	Thousands of U.S. dollars		
	2019		
	Carrying value	Fair value	Difference
(1)Cash and cash equivalents	\$ 754,499	\$ 754,499	\$ -
(2)Short-term investments	61,192	61,192	-
(3)Notes and accounts – trade receivables	1,164,243	1,164,243	-
(4)Electronically recorded monetary claims	85,913	85,913	-
(5)Investment securities	306,901	306,937	36
(6)Short-term loans receivable included in other current assets	642	642	-
Total assets	\$ 2,373,390	\$ 2,373,426	\$ 36
(7)Short-term bank loans	642,672	642,672	-
(8)Current portion of long-term debt	228,951	228,951	-
(9)Notes and accounts – trade payables	542,062	542,062	-
(10)Electronically recorded obligations	661,526	661,526	-
(11)Accrued income taxes	22,633	22,633	-
(12)Long-term debt	2,295,042	2,316,690	21,648
Total liabilities	\$ 4,392,886	\$ 4,414,534	\$ 21,648
Derivative transactions (*)	\$ 8,099	\$ 8,099	\$ -

\*Assets and liabilities arising from derivative transactions are shown at net value with the amount in parentheses representing net liability position.

Note 1:Methods to determine the fair value of financial instruments and other matters related to securities and derivative transactions

(1) Cash and cash equivalents, (2) Short-term investments, (3) Notes and accounts-trade receivables, (4) Electronically recorded monetary claims and (6) Short-term loans receivable included in other current assets  
Since these items are settled in a short time period, their carrying value approximates fair value.

(5) Investment securities

The fair value of equity securities is based on quoted market prices.

(7) Short-term bank loans, (9) Notes and accounts-trade payables (10) Electronically recorded obligations and (11) Accrued income taxes  
Since these items are settled in a short time period, their carrying value approximates fair value.

(8) Current portion of long-term debt and (12) Long-term debt

Long-term debt is composed of corporate bonds and long-term loans. The fair market value of corporate bonds is based on quoted market prices. The fair value of long-term loans is based on the present value of the total of principal and interest discounted by the interest rate to be applied assuming new loans under the similar conditions to existing loans are made.

Certain long-term loans with floating interest rates have been hedged by interest rate swap agreements and interest-rate and cross currency swap agreements. These have been accounted for as loans with fixed interest rates. The fair value of those long-term loans is based on the present value of the total of the principal, interest payments and net cash flows of the swap agreements discounted by the interest rates to be applied assuming new loans under similar conditions are made.

Derivative Transactions

Please refer to Note 16 "Derivative Financial Instruments and Hedging Activities" section of these Notes to Consolidated Financial Statements.

Note 2:Financial instruments for which it is extremely difficult to determine the fair value are as follows:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Unlisted stocks			
Stocks of subsidiaries and affiliates	¥ 24,949	¥ 18,735	\$ 225,507
Other	288	289	2,603
Total	¥ 25,237	¥ 19,024	\$ 228,110

Because no quoted market price is available and it is extremely difficult to determine the fair value, the above financial instruments are not included in the preceding table.

Note 3:Redemption schedules for cash and cash equivalents, receivables and marketable securities with maturities at March 31, 2019 and 2018 are as follows:

	Millions of yen			
	2019			
	Within one year	More than one year and within five years	More than five years and within ten years	More than ten years
Cash and cash equivalents	¥ 83,474	¥ -	¥ -	¥ -
Short-term investments	6,770	-	-	-
Trade receivables	128,806	-	-	-
Electronically recorded monetary claims	9,505	-	-	-
Short-term loans receivable included in other current assets	71	-	-	-
Total	¥ 228,626	¥ -	¥ -	¥ -

	Millions of yen			
	2018			
	Within one year	More than one year and within five years	More than five years and within ten years	More than ten years
Cash and cash equivalents	¥ 86,088	¥ -	¥ -	¥ -
Short-term investments	2,595	-	-	-
Trade receivables	143,692	-	-	-
Electronically recorded monetary claims	5,745	-	-	-
Short-term loans receivable included in other current assets	77	-	-	-
Total	¥ 238,197	¥ -	¥ -	¥ -

	Thousands of U.S. dollars			
	2019			
	Within one year	More than one year and within five years	More than five years and within ten years	More than ten years
Cash and cash equivalents	\$ 754,499	\$ -	\$ -	\$ -
Short-term investments	61,192	-	-	-
Trade receivables	1,164,243	-	-	-
Electronically recorded monetary claims	85,913	-	-	-
Short-term loans receivable included in other current assets	642	-	-	-
<b>Total</b>	<b>\$ 2,066,489</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>

Note 4: The redemption schedule for long-term debt is disclosed in Note 10 "Short-Term Bank Loans, Long-Term Debt and Lease Obligations" section of these Notes to Consolidated Financial Statements.

### 16. Derivative Financial Instruments and Hedging Activities

#### (a) Derivative transactions to which hedge accounting is not applied

The estimated fair value of the derivatives positions outstanding which do not qualify for deferral hedge accounting at March 31, 2019 and 2018 is summarized as follows:

#### Currency-related transactions

Classification	Transaction	Millions of yen			
		2019			
		Notional amount	More than one year	Fair value	Valuation gain (loss)
Forward foreign currency exchange contracts	Selling:				
	Euro	¥ 6,419	¥ -	¥ 30	¥ 30
	U.S. dollars	14,939	-	(129)	(129)
	Other	2,760	-	(24)	(24)
Over-the-counter transactions	Buying:				
	Other	572	-	6	6
Interest-rate and cross currency swaps	Receive/fixed yen and pay/fixed Euro	15,398	12,731	916	916
	Other	4,328	-	97	97
	<b>Total</b>	<b>¥ 44,416</b>	<b>¥ 12,731</b>	<b>¥ 896</b>	<b>¥ 896</b>

Classification	Transaction	Millions of yen			
		2018			
		Notional amount	More than one year	Fair value	Valuation gain (loss)
Forward foreign currency exchange contracts	Selling:				
	Euro	¥ 6,343	¥ -	¥ 131	¥ 131
	U.S. dollars	13,135	-	272	272
	Other	2,277	-	10	10
Over-the-counter transactions	Buying:				
	Other	1,774	-	64	64
Interest-rate and cross currency swaps	Receive/fixed yen and pay/fixed Euro	14,067	14,067	159	159
	<b>Total</b>	<b>¥ 37,596</b>	<b>¥ 14,067</b>	<b>¥ 636</b>	<b>¥ 636</b>

Classification	Transaction	Thousands of U.S. dollars				
		2019				
		Notional amount	More than one year	Fair value	Valuation gain (loss)	
Forward foreign currency exchange contracts	Selling:					
	Euro	\$ 58,020	\$ -	\$ 271	\$ 271	
	U.S. dollars	135,030	-	(1,166)	(1,166)	
	Other	24,947	-	(216)	(216)	
	Over-the-counter transactions	Buying:				
	Other	5,170	-	54	54	
Interest-rate and cross currency swaps	Receive/fixed yen and pay/fixed Euro	139,178	115,072	8,279	8,279	
	Other	39,119	-	877	877	
	<b>Total</b>	<b>\$ 401,464</b>	<b>\$ 115,072</b>	<b>\$ 8,099</b>	<b>\$ 8,099</b>	

The fair value of forward foreign currency exchange contracts is computed using prices provided by counterparty financial institutions.

#### (b) Derivative transactions to which hedge accounting is applied

The estimated fair value of the derivatives positions outstanding which qualify for deferral hedge accounting at March 31, 2019 and 2018 is summarized as follows.

Method of hedge accounting	Transaction	Millions of yen		
		2019		
		Notional amount	More than one year	Fair value
Swap rates applied to underlying long-term debt	Interest rate swaps Receive / floating and pay / fixed	¥ 6,000	¥ 6,000	(*1)
Forward foreign currency exchange contracts applied to underlying accounts-trade receivable	Forward foreign currency exchange contract Selling: U.S. dollars	¥ 130	¥ -	(*3)

Method of hedge accounting	Transaction	Millions of yen		
		2018		
		Notional amount	More than one year	Fair value
Swap rates applied to underlying long-term debt	Interest rate swaps Receive / floating and pay / fixed	¥ 14,000	¥ 6,000	(*1)
Swap rates and currency applied to underlying long-term debt	Interest-rate and cross currency swaps Receive / floating U.S. dollars and pay / fixed yen	¥ 1,500	-	(*2)
Forward foreign currency exchange contracts applied to underlying accounts-trade receivable	Forward foreign currency exchange contract Selling: U.S. dollars	¥ 86	-	(*3)

Method of hedge accounting	Transaction	Thousands of U.S. dollars		
		2019		
		Notional amount	More than one year	Fair value
Swap rates applied to underlying long-term debt	Interest rate swaps Receive / floating and pay / fixed	\$ 54,232	\$ 54,232	(*1)
Forward foreign currency exchange contracts applied to underlying accounts-trade receivable	Forward foreign currency exchange contract Selling: U.S. dollars	\$ 1,175	\$ -	(*3)

\*1 Because interest rate swap agreements are accounted for applying swap rates to underlying long-term debt, their fair value is included in that of long-term debt disclosed in Note 15 "Financial Instruments."

\*2 Because interest-rate and cross currency swaps agreements are accounted for applying swap rates to underlying long-term debt, their fair value is included in that of long-term debt disclosed in Note 15 "Financial Instruments."

\*3 Because forward foreign currency exchange contracts are accounted for applying forward foreign exchange rate to underlying accounts-trade receivable, for the years ended March 31, 2019 and 2018, respectively, their fair value is included in that of accounts-trade receivable.

### 17. Research and Development Costs

Research and development costs included in cost of sales and selling, general and administrative expenses totaled ¥21,661 million (\$195,788 thousand) and ¥21,007 million for the years ended March 31, 2019 and 2018, respectively

### 18. Loss on Surcharge Payments under the Anti-Monopoly Act

The Company has negotiated the compensation of damages with a part of customers in association with investigations by the authorities about the competition laws. Nevertheless, in overall consideration of the effects to operations of the Company and its consolidated subsidiaries due to extended negotiations, the Company reached the conclusion to pay the settlement amount because the Company considered that an amicable and early resolution would accord with the overall benefits for both parties.

As a result, the Company and its consolidated subsidiaries recorded loss on surcharge payments under the Anti-Monopoly Act in the amount of ¥2,108 million (\$19,054 thousand) and ¥3,710 million for the years ended March 31, 2019 and 2018, respectively.

### 19. Other Comprehensive Income (Loss)

The following table presents the analysis of other comprehensive income (loss) for the years ended March 31, 2019 and 2018.

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Net unrealized holding (loss) gain on securities:			
Amount arising during the year	¥ (6,254)	¥ 4,104	\$ (56,528)
Reclassification adjustments for gains included in profit	–	–	–
Before tax effect	(6,254)	4,104	(56,528)
Tax effect	1,894	(1,231)	17,119
Total	(4,360)	2,873	(39,409)
Translation adjustments:			
Amount arising during the year	(1,939)	5,269	(17,526)
Reclassification adjustments for gains included in profit	98	–	886
Before tax effect	(1,841)	5,269	(16,640)
Tax effect	–	–	–
Total	(1,841)	5,269	(16,640)
Retirement benefit liability adjustments:			
Amount arising during the year	(2,114)	1,069	(19,108)
Reclassification adjustments for gains included in profit	457	1,911	4,131
Before tax effect	(1,657)	2,980	(14,977)
Tax effect	392	(1,742)	3,543
Total	(1,265)	1,238	(11,434)
Share of other comprehensive (loss) income of affiliates accounted for by the equity method:			
Amount arising during the year	(936)	553	(8,460)
Reclassification adjustments for gains included in profit	(63)	(7)	(570)
Total	(999)	546	(9,030)
Other comprehensive (loss) income, net	¥ (8,465)	¥ 9,926	\$ (76,513)

### 20. Income Taxes

Income taxes applicable to the Company and its domestic subsidiaries comprise corporate taxes, inhabitants' taxes and enterprise taxes which, in the aggregate, resulted in statutory tax rates of 30.0% and 30.2% for the years ended March 31, 2019 and 2018, respectively. Overseas subsidiaries are subject to the income taxes of the respective countries in which they operate.

The effective tax rates for the years ended March 31, 2019 and 2018 differ from the Company's statutory tax rate for the following reasons:

	2019	2018
Statutory tax rates	30.0%	30.2%
Permanent non-deductible expenses	4.9	1.5
Permanent non-taxable income	(68.0)	(6.5)
Elimination of dividend income	96.7	8.0
Equity in earnings of affiliates	(1.0)	(0.5)
Difference in overseas consolidated subsidiaries' applicable tax rates	(53.1)	(7.7)
Increase in valuation allowance	267.2	5.3
Decrease in deferred tax assets due to change in statutory tax rates	(1.7)	(2.5)
Tax credit for research and development expenses	(1.6)	(2.1)
Unrealized inter-company profit	29.5	(3.5)
Other	6.9	(5.0)
Effective tax rates	309.8%	17.2%

The tax effects of temporary differences which gave rise to significant portions of the deferred tax assets and liabilities at March 31, 2019 and 2018 are presented below:

	Millions of yen		Thousands of U.S. dollars
	2019	2018	2019
Deferred tax assets:			
Tax loss carryforwards	¥ 16,616	¥ 7,965	\$ 150,188
Liability for retirement benefits	15,503	15,090	140,127
Impairment loss	5,882	1,026	53,166
Accrued expenses	4,115	4,403	37,194
Inventories	990	2,147	8,948
Valuation loss on investment securities	895	898	8,090
Other	4,101	4,103	37,068
Gross deferred tax assets	48,102	35,632	434,781
Valuation allowance for tax loss carryforwards	(11,118)	–	(100,493)
Valuation allowance for taxable temporary differences	(10,605)	–	(95,855)
Less: valuation allowance	(21,723)	(5,842)	(196,348)
Total deferred tax assets	26,379	29,790	238,433
Deferred tax liabilities:			
Depreciation and amortization	(8,895)	(8,886)	(80,400)
Unrealized holding gain on securities	(5,126)	(7,020)	(46,333)
Reserve for deferred gain on property included in retained earnings	(1,167)	(1,192)	(10,548)
Other	(1,119)	(1,018)	(10,114)
Total deferred tax liabilities	(16,307)	(18,116)	(147,395)
Net deferred tax assets	¥ 10,072	¥ 11,674	\$ 91,038

Note 1: Valuation allowance increased by ¥15,880 million (\$143,535 thousand) in the year ended March 31, 2019. The reason for this increase is that the Company and its consolidated subsidiaries recorded a valuation allowance along with the recording of tax loss carryforwards and impairment loss.

Note 2: Tax loss carryforwards and related deferred tax assets as of March 31, 2019 will expire as follows:

Millions of yen			
2019			
Year ending March 31,	Tax loss carryforwards (*1)	Valuation allowance for tax loss carryforwards	Deferred tax assets or tax loss carryforwards
2020	¥ 444	¥ (266)	¥ 178
2021	890	(612)	278
2022	698	(379)	319
2023	546	(184)	362
2024	528	(55)	473
2025 and thereafter	13,510	(9,622)	3,888
	¥ 16,616	¥ (11,118)	(*2) ¥ 5,498

Thousands of U.S. dollars			
2019			
Year ending March 31,	Tax loss carryforwards (*1)	Valuation allowance for tax loss carryforwards	Deferred tax assets or tax loss carryforwards
2020	\$ 4,013	\$ (2,404)	\$ 1,609
2021	8,045	(5,532)	2,513
2022	6,309	(3,426)	2,883
2023	4,935	(1,663)	3,272
2024	4,773	(498)	4,275
2025 and thereafter	122,113	(86,970)	35,143
	\$ 150,188	\$ (100,493)	(*2) \$ 49,695

(\*1) The tax loss carryforwards in the above table are measured using the statutory tax rates.

(\*2) The balance of deferred tax assets of ¥5,498 million (\$49,695 thousand) arising from tax loss carryforwards of ¥16,616 million (\$150,188 thousand) calculated after multiplying the loss amount with the statutory tax rates as of March 31, 2019. A certain portion of tax loss carryforwards was considered to be recoverable in future income taxes because it is probable that future taxable profit would be available.

## 21. Amounts per Share

Amounts per share at March 31, 2019 and 2018 and for the years then ended were as follows:

	Yen		U.S. dollars
	2019	2018	2019
Net assets	¥ 433.32	¥ 477.17	\$ 3.92
(Loss) profit attributable to owners of parent:			
Basic	(13.10)	38.36	(0.12)
Cash dividends	15.00	15.00	0.14

Amounts per share of net assets are computed based on the number of shares of common stock outstanding at the year end.

Basic profit or loss attributable to owners of parent per share is computed based on the profit or loss attributable to owners of parent of common stock and the weighted-average number of shares of common stock outstanding during the year. Diluted profit attributable to owners of parent per share has not been presented because there were no potentially dilutive shares of common stock and the Company and consolidated subsidiaries recorded loss attributable to owners of parent for the year ended March 31, 2019. Diluted profit attributable to owners of parent per share has not been presented because there were no potentially dilutive shares of common stock for the year ended March 31, 2018.

The Company recorded shares held by the "Officer Remuneration BIP Trust" (Please refer to Note 6) as treasury stock in the consolidated financial statements as of March 31, 2019 and 2018. Accordingly, to compute "net assets per share," the Company's shares held by the trust (479,761 shares and 566,826 shares at March 31, 2019 and 2018, respectively) are included in treasury stock that is excluded from the number of shares outstanding as of March 31, 2019 and 2018. In addition, to compute "(Loss) profit attributable to owners of parent per share," the Company's shares held by the trust (516,314 and 567,097 average number of shares for the years ended March 31, 2019 and 2018, respectively) are included in treasury stock that is excluded from the computation of the average number of shares for the years ended March 31, 2019 and 2018.

Cash dividends per share represent the cash dividends proposed by the Board of Directors as applicable to the respective years together with the interim cash dividends paid.

## 22. Segment Information

### 1. Outline of reporting segments

The Group's reporting segments are divisions of the Group for which separate financial information is available, and whose operating results are reviewed regularly by the highest management decision-making body (the Board of Directors meeting of the Company) in order to allocate management resources and assess performance of operations.

The Group's main business lines consist of the manufacture and sales of bearings, CVJs and precision equipments for the aftermarket, general industrial machinery market, and automotive market. Business activities in Japan are controlled by the Company (the Head Office), and overseas business activities are controlled by the General Manager responsible in each region. Business entities in each region prepare their own plans and strategies to conduct business activities while analyzing profitability and the investment efficiency of operations.

Accordingly, the Group has four reporting segments based on geographic business segmentation controlled by the Head Office or the General Managers: Japan, the Americas, Europe, and Asia and other areas. Each reporting segment engages in the manufacture and sale of bearings, CVJs, and precision equipments and other products.

### 2. Calculation methods used for net sales, profit or loss, assets, liabilities and other items on each reporting segment

The accounting policies of the segments are substantially the same as those described in Note 2 "Summary of Significant Accounting Policies." Inter-segment sales and transfers are recorded at the same prices used in transactions with third parties.

In addition, the Company and its consolidated subsidiaries have been applied "Partial Revision of Accounting Standard for Tax Effect Accounting" (ASBJ Guidance No. 28 issued on February 16, 2018) from the beginning of the current consolidated fiscal year. The segment assets and segment liabilities in the previous consolidated fiscal year are the amounts after retrospective application of the accounting standard.

### (Application of IFRS 15)

The consolidated subsidiaries in overseas excluding a part of consolidated subsidiaries have been applied IFRS 15, "Revenue from Contracts with Customers" from the beginning of the current consolidated fiscal year. The cumulative effect of applying IFRS 15 was recognized by adjusting retained earnings at the beginning of the fiscal year ended March 31, 2019, in accordance with the transitional treatment provided in its standard. Therefore, the amounts in previous consolidated fiscal year are not revised. In addition, the effects of applying IFRS 15 on segment information are immaterial.

### 3. Information as to net sales, profit or loss, assets, liabilities, and other items for each reporting segment for the years ended March 31, 2019 and 2018

Reportable segment information for the years ended March 31, 2019 and 2018 is summarized as follows:

Millions of yen							
2019							
Reporting segments							
	Japan	Americas	Europe	Asia and other areas	Total	Adjustments	Consolidated
<b>Sales, profit and assets or liabilities by reporting segments:</b>							
Net sales:							
Sales to third parties	¥ 216,268	¥ 194,668	¥ 179,827	¥ 142,806	¥ 733,569	¥ -	¥ 733,569
Inter-segment sales and transfers	136,804	3,635	4,177	12,771	157,387	(157,387)	-
Total	353,072	198,303	184,004	155,577	890,956	(157,387)	733,569
Segment profit	¥ 682	¥ 4,345	¥ 955	¥ 17,218	¥ 23,200	¥ 3,746	¥ 26,946
Segment assets	¥ 609,258	¥ 176,903	¥ 143,805	¥ 173,683	¥ 1,103,649	¥ (262,898)	¥ 840,751
Segment liabilities	¥ 417,716	¥ 107,032	¥ 110,503	¥ 45,417	¥ 680,668	¥ (86,322)	¥ 594,346
<b>Other items:</b>							
Depreciation and amortization	¥ 15,285	¥ 9,687	¥ 7,117	¥ 6,837	¥ 38,926	¥ -	¥ 38,926
Capital expenditures	¥ 27,253	¥ 13,600	¥ 9,366	¥ 5,146	¥ 55,365	¥ (553)	¥ 54,812

	Millions of yen						
	2018						
	Reporting segments						
	Japan	Americas	Europe	Asia and other areas	Total	Adjustments	Consolidated
<b>Sales, profit and assets or liabilities by reporting segments:</b>							
Net sales:							
Sales to third parties	¥ 213,977	¥ 194,277	¥ 188,225	¥ 147,894	¥ 744,373	¥ –	¥ 744,373
Inter-segment sales and transfers	133,346	4,269	4,292	14,058	155,965	(155,965)	–
<b>Total</b>	<b>347,323</b>	<b>198,546</b>	<b>192,517</b>	<b>161,952</b>	<b>900,338</b>	<b>(155,965)</b>	<b>744,373</b>
Segment profit	¥ 8,015	¥ 7,092	¥ 2,800	¥ 19,601	¥ 37,508	¥ 2,101	¥ 39,609
Segment assets	¥ 600,896	¥ 162,740	¥ 153,105	¥ 172,888	¥ 1,089,629	¥ (250,202)	¥ 839,427
Segment liabilities	¥ 390,465	¥ 104,599	¥ 112,591	¥ 52,238	¥ 659,893	¥ (90,226)	¥ 569,667
Other items:							
Depreciation and amortization	¥ 13,482	¥ 9,854	¥ 7,236	¥ 6,934	¥ 37,506	¥ –	¥ 37,506
Capital expenditures	¥ 26,409	¥ 10,287	¥ 7,710	¥ 4,267	¥ 48,673	¥ (201)	¥ 48,472

	Thousands of U.S. dollars						
	2019						
	Reporting segments						
	Japan	Americas	Europe	Asia and other areas	Total	Adjustments	Consolidated
<b>Sales, profit and assets or liabilities by reporting segments:</b>							
Net sales:							
Sales to third parties	\$ 1,954,788	\$ 1,759,552	\$ 1,625,408	\$ 1,290,785	\$ 6,630,533	\$ –	\$ 6,630,533
Inter-segment sales and transfers	1,236,535	32,855	37,755	115,434	1,422,579	(1,422,579)	–
<b>Total</b>	<b>3,191,323</b>	<b>1,792,407</b>	<b>1,663,163</b>	<b>1,406,219</b>	<b>8,053,112</b>	<b>(1,422,579)</b>	<b>6,630,533</b>
Segment profit	\$ 6,164	\$ 39,274	\$ 8,632	\$ 155,629	\$ 209,699	\$ 33,859	\$ 243,558
Segment assets	\$ 5,506,919	\$ 1,598,978	\$ 1,299,815	\$ 1,569,874	\$ 9,975,586	\$ (2,376,264)	\$ 7,599,322
Segment liabilities	\$ 3,775,623	\$ 967,433	\$ 998,807	\$ 410,512	\$ 6,152,375	\$ (780,242)	\$ 5,372,133
Other items:							
Depreciation and amortization	\$ 138,157	\$ 87,558	\$ 64,329	\$ 61,798	\$ 351,842	\$ –	\$ 351,842
Capital expenditures	\$ 246,332	\$ 122,927	\$ 84,657	\$ 46,513	\$ 500,429	\$ (4,998)	\$ 495,431

The total amount of segment profit is adjusted to operating income of the consolidated statement of operations.

Other than those corresponding to segment assets, adjustments relate to the elimination of inter-segment transactions, etc. The adjustments for segment assets consist of inter-segment elimination, etc. of ¥297,147 million (\$2,685,832 thousand) and ¥290,727 million and the corporate assets of the Group of ¥34,249 million (\$309,567 thousand) and ¥40,525 million for the years ended March 31, 2019 and 2018, respectively. The corporate assets are mainly long-term investment funds (investment securities) for the years ended March 31, 2019 and 2018.

#### 4.Related information

##### (1)Sales by products and service

Sales by products and service classified by the similarity of the market for the years ended March 31, 2019 and 2018 are summarized as follows:

	Millions of yen			
	2019			
	Aftermarket	Industrial machinery	Automotive	Total
Sales to third parties	¥ 118,849	¥ 123,398	¥ 491,322	¥ 733,569

	Millions of yen			
	2018			
	Aftermarket	Industrial machinery	Automotive	Total
Sales to third parties	¥ 116,695	¥ 119,085	¥ 508,593	¥ 744,373

	Thousands of U.S. dollars			
	2019			
	Aftermarket	Industrial machinery	Automotive	Total
Sales to third parties	\$ 1,074,244	\$ 1,115,361	\$ 4,440,928	\$ 6,630,533

##### (2)Regional information

###### (a)Sales

Sales categorized by country and region based on locations of customers within the Group for the years ended March 31, 2019 and 2018 are summarized as follows:

	Millions of yen				
	2019				
	Japan	Americas	Europe	Asia and other areas	Total
	¥ 207,249	¥ 201,464	¥ 167,826	¥ 157,030	¥ 733,569

	Millions of yen				
	2018				
	Japan	Americas	Europe	Asia and other areas	Total
	¥ 204,325	¥ 201,677	¥ 175,599	¥ 162,772	¥ 744,373

	Thousands of U.S. dollars				
	2019				
	Japan	Americas	Europe	Asia and other areas	Total
	\$ 1,873,268	\$ 1,820,979	\$ 1,516,934	\$ 1,419,352	\$ 6,630,533

"Americas" includes the U.S.A., Canada and Central and South America. "Europe" includes Germany, France, the U.K. and others. "Asia and other areas" include China, Thailand, India and others. The sales of the "Americas" segment above include the sales to customers in the U.S.A. of ¥171,062 million (\$1,546,183 thousand) and ¥172,454 million for the years ended March 31, 2019 and 2018, respectively. The sales of the "Asia and other areas" segment above include the sales to customers in China of ¥79,886 million (\$722,068 thousand) and ¥86,709 million for the years ended March 31, 2019 and 2018, respectively.

(b)Property, plant and equipment

Property, plant and equipment categorized by country and region within the Group at March 31, 2019 and 2018 are summarized as follows:

Millions of yen				
2019				
Japan	Americas	Europe	Asia and other areas	Total
¥ 104,182	¥ 79,046	¥ 48,400	¥ 48,235	¥ 279,863

Millions of yen				
2018				
Japan	Americas	Europe	Asia and other areas	Total
¥ 113,587	¥ 72,952	¥ 49,544	¥ 51,976	¥ 288,059

Thousands of U.S. dollars				
2019				
Japan	Americas	Europe	Asia and other areas	Total
\$ 941,673	\$ 714,475	\$ 437,475	\$ 435,983	\$ 2,529,606

1. Property, plant and equipment in "Americas" in the amount of ¥70,062 million (\$633,272 thousand) and ¥64,293 million is located in the U.S.A. at March 31, 2019 and 2018, respectively.
2. Property, plant and equipment in "Europe" in the amount of ¥31,930 million (\$288,607 thousand) and ¥34,724 million is located in France at March 31, 2019 and 2018, respectively.
3. Property, plant and equipment in "Asia and other areas" in the amount of ¥35,843 million (\$323,975 thousand) and ¥38,839 million is located in China at March 31, 2019 and 2018, respectively.

**5.Loss on impairment of fixed assets**

Loss on impairment of fixed assets by reporting segment for the years ended March 31, 2019 and 2018 is summarized as follows:

Millions of yen					
2019					
Japan	Americas	Europe	Asia and other areas	Adjustments	Total
¥ 16,963	¥ -	¥ -	¥ -	¥ -	¥ 16,963

Millions of yen					
2018					
Japan	Americas	Europe	Asia and other areas	Adjustments	Total
¥ 635	¥ -	¥ -	¥ -	¥ -	¥ 635


Thousands of U.S. dollars					
2019					
Japan	Americas	Europe	Asia and other areas	Adjustments	Total
\$ 153,324	\$ -	\$ -	\$ -	\$ -	\$ 153,324

**23.Subsequent Event**

The following distribution of retained earnings of the Company, which has not been reflected in the accompanying consolidated financial statements as of March 31, 2019 and for the year then ended, was approved at the annual general meeting of the shareholders held on June 25, 2019:

	Millions of yen	Thousands of U.S. dollars
Year-end cash dividends (¥7.5 (U.S. \$0.07) per share)	¥ 3,987	\$ 36,037

**Independent Auditor's Report**



**Independent Auditor's Report**

**The Board of Directors  
NTN Corporation**

We have audited the accompanying consolidated financial statements of NTN Corporation and its consolidated subsidiaries, which comprise the consolidated balance sheet as at March 31, 2019, and the consolidated statements of operations, 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 NTN Corporation 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 1.

*Ernst & Young ShinNihon LLC*

**June 28, 2019  
Osaka, Japan**

1

A member firm of Ernst & Young Global Limited

# Non-Financial Data (ESG Factors)

Other non-financial data can be viewed on our website.  
<https://www.ntnglobal.com/en/csr/nonfinance.html>

## Governance (G) Factors

● NTN only ● Domestic subsidiaries ● Overseas subsidiaries

Item	Applicable Scope	Fiscal year ended	Fiscal year ended	See page:
		March 31, 2018	March 31, 2019	
		Achievements	Achievements	
Number of directors Total	●	14	14	P.41
Male	●	14	14	P.41
Female	●	0	0	P.41
Number of directors not serving as Operating Officers	●	14	14	-
Number of Outside Directors	●	2	2	P.47
Percentage of Outside Directors	●	14%	14%	P.47
Number of Outside Audit & Supervisory Board Members	●	3	3	-
Board of Directors				
Number of meetings per year	●	18	19	P.43
Director (outside) attendance rate	●	100%	100%	P.43
Director (inside) attendance rate	●	99%	99%	P.43
Audit & Supervisory Board Members (outside) attendance rate	●	100%	95%	P.43
Audit & Supervisory Board Members (inside) attendance rate	●	100%	100%	P.43
Audit & Supervisory Board				
Number of meetings per year	●	15	15	-
Audit & Supervisory Board Members (outside) attendance rate	●	100%	98%	-
Audit & Supervisory Board Members (inside) attendance rate	●	100%	100%	-
Compensation Advisory Committee				
Number of meetings per year	● ● ●	5	7	P.48
Director (outside) attendance rate	●	100%	100%	-
Director (inside) attendance rate	●	100%	100%	-
Audit & Supervisory Board Members (outside) attendance rate	●	100%	100%	-
Number of sites subject to internal control assessments	● ● ●	51	49	P.51
Number of SRI indexes included in	●	6*	6*	P.50
Number of shareholders at the General Meeting of Shareholders	●	213	122	-
Percentage of votes cast	●	82.6%	82.9%	-
Total annual cash dividends per share	●	15 yen	15 yen	P.79
Number of Stakeholder Dialog held with CSR experts	●	1	1	P.55
Number of CSR Committee held per year	●	2	0	-
Number of Risk Management Committee held per year	● ● ●	3	2	P.52
Number of Compliance Committee held per year	●	4	4	P.53
Number of Fair Trade Monitoring Committee held per year	●	2	2	P.53
Response rate of survey of "Compliance awareness"	● ●	76%	79%	P.54
Helpline				
Recognition level	● ●	81%	79%	P.54
Number of reports from whistle-blower	● ●	17	6	P.54
Report response rate	● ●	100%	100%	P.54

\* As of July 31

## Environment (E) Factors

● NTN only ● Domestic subsidiaries ● Overseas subsidiaries

Item	Applicable Scope	Fiscal year ended	Fiscal year ended	See page:
		March 31, 2018	March 31, 2019	
		Achievements	Achievements	
CO2 emissions				
Total	● ● ●	641,000 metric tons	674,000 metric tons	P.73
Domestic	● ● ●	49,000 metric tons	48,000 metric tons	P.73
Scope 1	● ● ●	237,000 metric tons	242,000 metric tons	P.73
Scope 2	● ● ●	54,000 metric tons	57,000 metric tons	P.73
Overseas	● ● ●	301,000 metric tons	327,000 metric tons	P.73
Scope 1	● ● ●	54,000 metric tons	57,000 metric tons	P.73
Scope 2	● ● ●	301,000 metric tons	327,000 metric tons	P.73
Water usage				
Total	● ● ●	3.22 million m <sup>3</sup>	3.47 million m <sup>3</sup>	P.72
Domestic	● ● ●	1.94 million m <sup>3</sup>	2.13 million m <sup>3</sup>	P.72
Overseas	● ● ●	1.28 million m <sup>3</sup>	1.34 million m <sup>3</sup>	P.72
Generated waste				
Total	● ● ●	176,000 metric tons	177,000 metric tons	P.72
Domestic	● ● ●	68,000 metric tons	68,000 metric tons	P.72
Overseas	● ● ●	108,000 metric tons	109,000 metric tons	P.72
Recycling rates				
Total	● ● ●	97.9%	97.4%	P.72
Domestic	● ● ●	99.9%	98.5%	P.72
Overseas	● ● ●	96.7%	96.7%	P.72

## Social (S) Factors

● NTN only ● Domestic subsidiaries ● Overseas subsidiaries

Item	Applicable Scope	Fiscal year ended	Fiscal year ended	See page:
		March 31, 2018	March 31, 2019	
		Achievements	Achievements	
R&D expenditures	● ● ●	21.0 billion yen	21.7 billion yen	P.29
Ratio of R&D expenditures to sales	● ● ●	2.8%	3.0%	P.29
Number of outside awards received for product development	● ● ●	3	4	P.29
Number of patents reward being paid	● ● ●	129	138	P.29
Ratio of local procurement (Total)	● ● ●	88%	90%	P.63
(Americas)	● ● ●	84%	89%	P.63
(Europe)	● ● ●	94%	95%	P.63
(Asia and Others)	● ● ●	84%	89%	P.63
Subcontracting self-auditing rate	● ● ●	95%	100%	P.63
Conflict minerals survey response rate from business partners	● ● ●	92%	88%	P.63
Overseas Production Rate (Total)	● ● ●	52%	49%	P.65
(Americas)	● ● ●	19%	20%	P.65
(Europe)	● ● ●	17%	16%	P.65
(Asia and Others)	● ● ●	16%	14%	P.65
Number of participants in specialized quality education courses	● ● ●	112	127	P.66
Quality management system certification rate*1	● ● ●	100%	100%	P.66
Number of Sales TQM (Total Quality Management) activities	● ● ●	120	64	P.66
Number of customer visits by Technical Service Units	● ● ●	727	584	-
Number of employees	● ● ●	25,493	24,988	-
Percentage of female employees	● ● ●	11%	11%	-
Percentage of employees overseas	● ● ●	67%	65%	P.10
Average age				
Total	● ● ●	41	41	-
Male	● ● ●	41	41	-
Female	● ● ●	39	39	-
Average years of continuous employment				
Total	● ● ●	19	19	-
Male	● ● ●	19	19	-
Female	● ● ●	17	18	-
Percentage of hired female graduates	● ● ●	14%	16%	P.10
Employment rate of persons with disabilities	● ● ●	2.06%	2.13%	P.60
Number of women in management positions (NTN only)*2	● ● ●	32	31	P.60
Percentage of women in management positions (NTN + domestic subsidiaries)*2	● ● ●	3.6%	3.5%	P.60
(NTN Group)*2	● ● ●	12.2%	14.5%	P.60
Post-retirement rehiring rate (NTN only)	● ● ●	62%	90%	P.60
Number of employees taking leave for partner's childbirth	● ● ●	178	204	P.60
Number of employees taking childcare leave				
Total	● ● ●	44	47	P.61
Male	● ● ●	3	2	P.61
Female	● ● ●	41	45	P.61
Number of employees returning after childcare leave				
Total	● ● ●	18	19	P.61
Male	● ● ●	3	1	P.61
Female	● ● ●	15	18	P.61
Percentage of employees returning after childcare leave	● ● ●	100%	95%	P.61
Number of employees on shortened working hours for childcare				
Total	● ● ●	31	35	P.61
Male	● ● ●	0	1	P.61
Female	● ● ●	31	34	P.61
Number of employees taking long-term care leave	● ● ●	1	1	P.61
Number of employees using NTN Job Return scheme	● ● ●	2	0	P.61
Number of employees using intra-company child daycare center (Bear Kids Land)	● ● ●	34	32	P.61
Number of employees using the facility supporting persons with intellectual disabilities (Dream Workshop)	● ● ●	15	12	P.60
Number of employees taking mental health leave	● ● ●	26	27	P.62
Percentage of returning employees taking mental health leave	● ● ●	50%	50%	P.62
Number of counseling service consultations per month	● ● ●	69	56	P.62
Percentage of high-stress employees*3	● ● ●	8%	8%	P.62
Rate of workplace incidents causing lost work time	● ● ●	0.08*4	0.64*5	P.62
Number of workplace incidents causing lost work time	● ● ●	1*4	8*5	P.62
Number of law-related training sessions held by safety and health consultants	● ● ●	8	7	P.62
Percentage of designated health checks provided	● ● ●	100%	100%	P.62
Number of ISO 45001-certified sites	● ● ●	0	6	P.62
Number of OSHMS-certified sites	● ● ●	9	3	P.62
Number of hazard simulation classes provided	● ● ●	95	73	P.62

\*1: ISO 9001, IATF 16949

Applies to domestic and overseas consolidated manufacturing subsidiaries (excluding bases that have not started mass production).

\*2: Includes three consolidated subsidiaries merged in October 2018: NTN KONGO CORP., NTN MIKUMO COMPANY LTD. and NTN ENGINEERING PLASTICS CORP.

\*3: As determined by NTN stress check program.

\*4: December 16, 2016 to December 15, 2017

\*5: December 16, 2017 to December 15, 2018



# Third-Party Opinion

## NTN Report 2019 third-party opinion



Professor, Faculty of Economics, Takasaki City University of Economics

### Takeshi Mizuguchi

#### Profile

After working at a trading company and auditing firm, Mizuguchi became a lecturer in the Faculty of Economics at Takasaki City University of Economics in 1997. He assumed his present role in 2008. Mizuguchi specializes in responsible investment and non-financial information disclosure. He has served as Chair of the Green Bonds Working Group (Ministry of the Environment), a member of the ESG Working Group (Ministry of the Environment) and Director of the Society for Environmental Economics and Policy Studies. His major publications include *Responsible Investment—Changing the Future through the Flow of Capital* (Iwanami Shoten, Publishers; winner of the SEEPS Commentary Award), *ESG Investment—Form of the New Capitalism* (Nikkei Publishing) and *An Era of Sustainable Finance—ESG/SDGs and the Bond Market* (Written and Edited by KINZAI).

NTN has transitioned to a Company with Nominating Committee, etc. this year. I believe this was an important reform in the corporate governance. In order not to let this lose its substance, it is important how responsibly the Board of Directors, led by the Outside Directors, can fulfill its monitoring role. In this regard, I believe it was a good idea to devote four pages in this report to the Outside Director Dialog, for the attitudes and insights of Outside Directors and their thoughts on their work can be conveyed to outside stakeholders. I hope to see this feature in the report every year.

I am also impressed by the fact that you are focusing on technology transfer among employees and development of human resources. In particular, it is effective to provide not only training systems, but also other opportunities such as Global QC Circle Convention and NTN Technical Skills Competition. Furthermore, "NTN PROUD AWARD," in which employees compete in activities that link the corporate philosophy to their daily work, was attended by more than 1,700 employees worldwide. No matter how impressive the management philosophy might be, it will not be actualized after all unless the behavior of each employee at workplace changes. So, I believe this initiative is very important.

From that point of view, I believe that the dialog between the president and employees, which was featured for the first time this year, was also a good effort. If it was the preparation of this report which led to an opportunity for such dialog, you can say that it was an effective use of the report. I suggest a dialog with overseas employees will be also a good initiative next time.

"Value Creation Risks and Opportunities" on page 13 of

the report lists environmental issues, especially climate change, as one of the important factors. In response to these issues, you offer various products such as a condition monitoring system for wind turbines, "NTN Micro Hydro Turbines," and "N<sup>3</sup> N-CUBE." I highly value the fact that you define environment-contributing products based on your own standards and is making efforts to increase the percentage of higher-grade products.

On the other hand, in October 2018, the IPCC (Intergovernmental Panel on Climate Change) published the "Special Report on Global Warming of 1.5°C" and issued the following serious message: "The global mean surface temperature has already increased by 1°C relative to the pre-industrial period, and is likely to reach 1.5°C sometime before 2050 if it continues to increase at the current rate. The world with global warming of 1.5°C, although not as much as that of 2°C, will have heavy rains and flood damages more frequently than we do now. In order to limit the mean surface temperature increase to 1.5°C, it is necessary to reduce CO<sub>2</sub> emissions to net zero at around 2050." I believe that with this report the world's leading companies have set their targets even higher than before.

Reflecting on your initiatives in that context, the base year for the definition of environment-contributing products could be raised even higher to accelerate your environmental initiatives. In addition, I believe that some of your customers have made commitments such as expressing support for RE100, SBT, and TCFD. I suggest you, too, make such commitments while contributing through your products. That will lead to state that you are part of a community that shares the same goals.

# Investor Information (as March 31, 2019)

#### Head Office

NTN Corporation  
3-17, 1-chome, Kyomachibori, Nishi-ku,  
Osaka 550-0003, Japan

#### Transfer Agent for Common Stock

Mitsubishi UFJ Trust and Banking Corporation  
4-5, 1-chome, Marunouchi, Chiyoda-ku,  
Tokyo 100-8212, Japan

#### General Meeting of Shareholders

The General Meeting of Shareholders was held on June 25, 2019; Osaka

#### Common Stock

Authorized: 1,800,000,000  
Issued and Outstanding: 532,463,527

#### Stock Exchange Listings

First Section of Tokyo Stock Exchange (#6472)

#### Stock Price Range in the Fiscal Year ended March 31, 2019

High: 536 yen  
Low: 296 yen

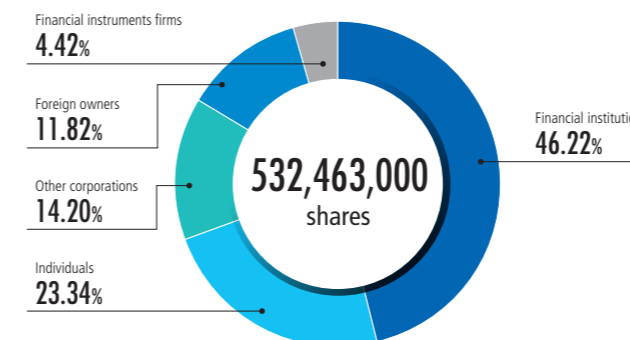
#### Number of Shareholders

45,296

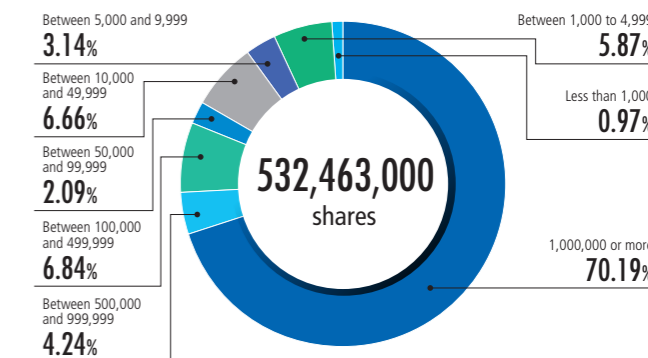
#### Independent Audit Firm

Ernst & Young ShinNihon LLC

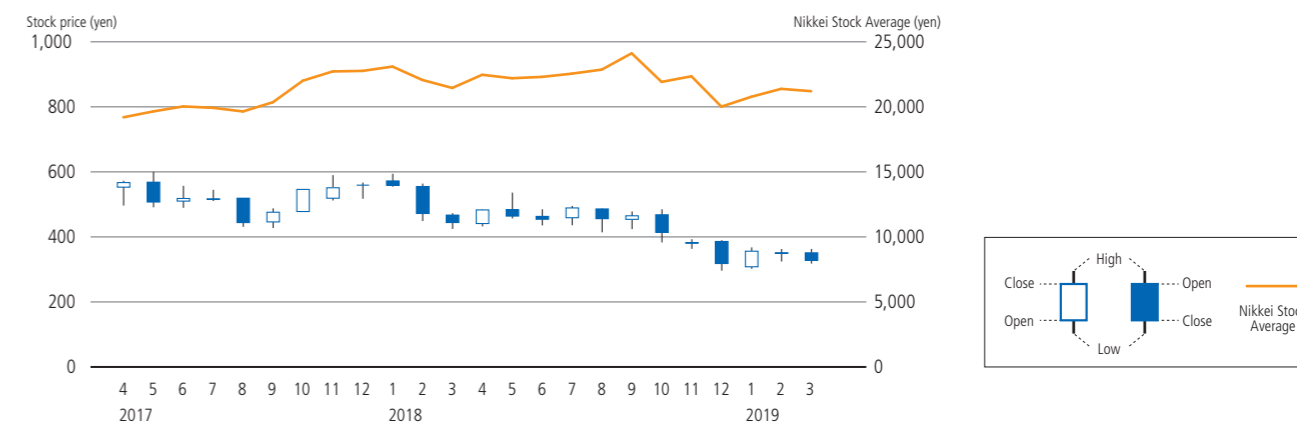
#### Breakdown of Shareholders



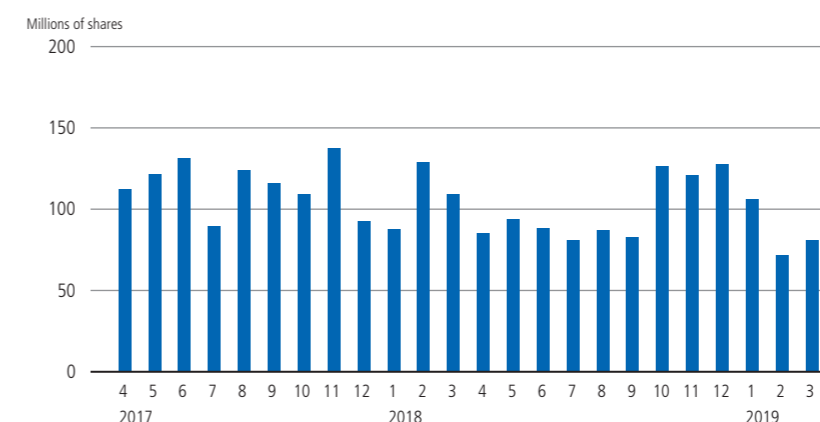
#### Breakdown of Number of Shares Held



#### Recent Stock Price Range



#### Monthly Volume Traded



## Response to the third-party opinion

I would like to express my heartfelt thanks to Professor Mizuguchi for his valuable opinion.

In June 2019, we became a Company with Nominating Committee, etc., and now has a governance system that is designed to improve corporate value over the medium- to long-term. Responding to climate change is an urgent issue as shown in the IPCC Special Report that Professor Mizuguchi has mentioned. We recognize that it is crucial for us to contribute to saving energy and creating a society independent from fossil fuels through the technologies we have cultivated.

Contribution to society through our technologies is incorporated in our corporate philosophy. Through our efforts such as continuing "NTN PROUD AWARD," which Professor Mizuguchi has spoken highly of, we will work to spread this philosophy among our employees worldwide to become a company that can think and act on its own.

The valuable opinion Professor Mizuguchi has provided us will be carefully considered as we work on finding solutions to issues of public concern through our business activities and fulfil our mission to develop a "smooth society."



Senior Managing Executive Officer  
In charge of CSR Headquarters

### Itsuji Goto

#### Inquiries

Corporate Communications Department  
T E L : +81-6-6449-3528  
F A X : +81-6-6443-3226  
E-mail: irmanager@ntn.co.jp

#### NTN on the Internet

NTN's website offers a variety of corporate and product information, including the latest NTN Report and financial results.

<https://www.ntnglobal.com/en/index.html>

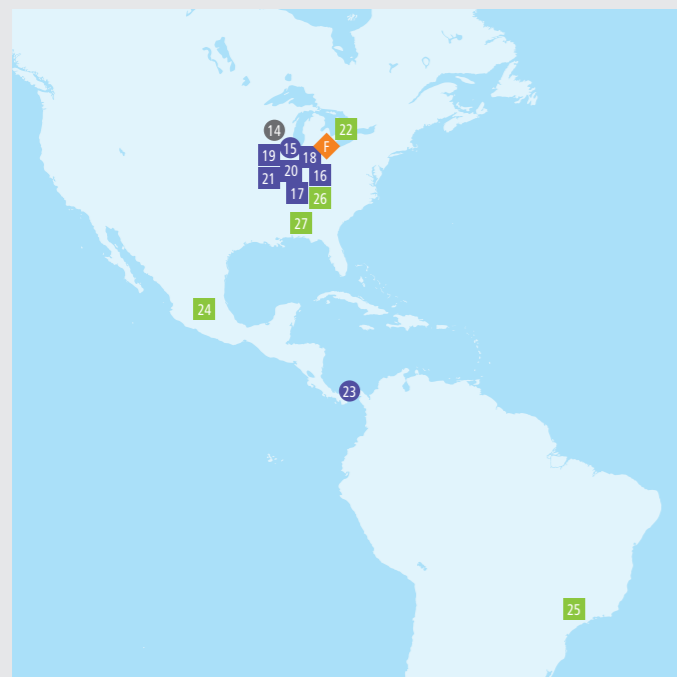
# Global Network (as of March 31, 2019)

## Japan



Company name	Paid-in capital	Holdings as percentage (%)
I NTN Corporation (parent company)		
II Industrial Business Headquarters, Kuwana Works		
III Industrial Business Headquarters, Nagano Works		
IV Industrial Business Headquarters, Kongo Works		
V Automotive Business Headquarters, Iwata Works		
VI Automotive Business Headquarters, Okayama Works		
VII Automotive Business Headquarters Mikumo Works		
VIII Composite Material Product Division, Engineering Plastics Works		
1 NTN SALES JAPAN CORP.	JPY 480,000,000	100
2 NTN MIE CORP.	JPY 3,000,000,000	100
3 NTN HOUDATSU SHIMIZU CORP.	JPY 1,250,000,000	100
4 NTN NOTO CORP.	JPY 1,000,000,000	100
5 NTN FUKUROI CORP.	JPY 1,500,000,000	100
6 NTN AKAIWA CORP.	JPY 1,250,000,000	100
7 NTN OMAEZAKI CORP.	JPY 266,000,000	97.4
8 NTN Advanced Materials Corp.	JPY 400,000,000	99.34
9 NTN CASTING CORP.	JPY 450,000,000	100
10 NTN KINAN CORP.	JPY 450,000,000	100
11 NTN KAMIINA CORP.	JPY 725,000,000	80
12 NTN TECHNICAL SERVICE CORP.	JPY 200,000,000	100
13 NTN LOGISTICS CO., LTD.	JPY 10,000,000	100 (100)
A New Product Development R&D Center		
B Production Engineering R&D Center		
C CAE R&D Center		
D Advanced Technology R&D Center		
E NTN Next Generation Research Alliance Laboratory		

## Americas



Company name	Paid-in capital	Holdings as percentage (%)
14 NTN USA CORP.	USD 200,620,000	100
15 NTN BEARING CORP. OF AMERICA	USD 24,700,000	100 (100)
16 NTN DRIVESHAFT, INC.	USD 54,580,000	100 (100)
17 NTN DRIVESHAFT ANDERSON, INC.	USD 19,500,000	100 (100)
18 AMERICAN NTN BEARING MFG. CORP.	USD 24,330,000	100 (100)
19 NTN-BOWER CORP.	USD 117,000,000	100 (100)
20 NTK PRECISION AXLE CORP.	USD 15,000,000	60 (60)
21 NTA PRECISION AXLE CORP.	USD 20,000,000	62.5 (62.5)
22 NTN BEARING CORP. OF CANADA LTD.	CAD 20,100,000	100
23 NTN-SUDAMERICANA, S.A.	USD 700,000	100
24 NTN MANUFACTURING DE MEXICO, S.A.DE C.V.	MXN 532,705,718	100 (5)
25 NTN DO BRASIL PRODUÇÃO DE SEMI-EIXOS LTDA.	BRL 390,739,432	100 (2.72)
26 ASAHII FORGE OF AMERICA CORP.	USD 10,100,000	19.8 (19.8)
27 Seohan-NTN Driveshaft USA Corp.	USD 6,000,000	49
F NTN Automotive Center		

One consolidated subsidiary in addition to the Group companies above

NOTES 1. The scope of consolidation as of March 31, 2019 consisted of NTN Corporation and 58 consolidated subsidiaries (13 domestic and 45 overseas subsidiaries). A total of 8 affiliates (all overseas affiliates) were accounted for by the equity method.  
 The following changes to the scope of consolidation and application of the equity method were made during the fiscal year under review.  
 ◆Consolidated subsidiaries: No additions/4 removals  
 ◆Affiliates: No additions/1 removal  
 2. Of the above subsidiaries, the following companies are specified subsidiaries: NTN USA CORP., NTN DRIVESHAFT, INC., NTN-BOWER CORP., NTN DO BRASIL PRODUÇÃO DE SEMI-EIXOS LTDA., NTN Wälzlager (Europa) G.m.b.H., NTN-SNR ROULEMENTS ("NTN-SNR"), NTN Transmissions Europe, NTN NEI Manufacturing India Private LTD., NTN (CHINA) Investment Corporation, NANJING NTN CORP., SHANGHAI NTN CORP., and NTN-LYC (LUOYANG) BEARING Corporation

## Europe



Company name	Paid-in capital	Holdings as percentage (%)
28 NTN Wälzlager (Europa) G.m.b.H.	EUR 14,500,000	100
29 NTN Kugellagerfabrik (Deutschland) G.m.b.H.	EUR 18,500,000	100
30 NTN Mettmann (Deutschland) G.m.b.H.	EUR 25,000	100 (100)
31 NTN Antriebstechnik G.m.b.H.	EUR 50,000	100
32 NTN BEARINGS (UK) LTD.	GBP 2,600,000	100 (0.04)
33 NTN-SNR ROULEMENTS	EUR 123,599,542	100
34 NTN Transmissions Europe	EUR 82,843,207	100
35 NTN TRANSMISSIONS EUROPE CREZANCY	EUR 11,500,000	100 (100)
G NTN-SNR R&D Center		

Six consolidated subsidiaries in addition to the Group companies above

## Asia and Others



Company name	Paid-in capital	Holdings as percentage (%)
36 NTN BEARING-SINGAPORE (PTE) LTD.	SGD 36,000,000	100 (0.97)
37 NTN BEARING-MALAYSIA SDN. BHD.	MYR 10,000,000	100 (100)
38 NTN BEARING-THAILAND CO., LTD.	THB 780,000,000	100 (99.99)
39 NTN Manufacturing (Thailand) CO., LTD.	THB 1,311,000,000	100 (99.99)
40 NTPT CO., LTD.	THB 700,000,000	75 (10.73)
41 PT. NTN BEARING INDONESIA	USD 7,300,000	100 (100)
42 NTN Bearing India Private Ltd.	INR 300,000,000	100 (0.1)
43 NTN NEI Manufacturing India Private Ltd.	INR 4,808,000,000	97.4 (24.96)
44 NTN KOREA CO., LTD.	KRW 500,000,000	100
45 NTN (CHINA) Investment Corporation	USD 256,545,000	100
46 NANJING NTN CORP.	USD 180,000,000	100 (86.67)
47 SHANGHAI NTN CORP.	USD 166,500,000	95 (15.72)
48 Guangzhou NTN-Yulon Drivetrain Co., Ltd.	USD 12,500,000	60 (12)
49 Xiangyang NTN-Yulon Drivetrain Co., Ltd.	USD 34,000,000	60 (60)
50 NTN-RAB (CHANGZHOU) CORP.	USD 28,440,000	100
51 NTN-LYC (LUOYANG) BEARING CORP.	USD 73,800,000	50 (50)
52 NTN CHINA LTD.	HKD 2,500,000	100
53 TUNG PEI INDUSTRIAL CO., LTD.	TWD 1,257,232,620	27.35
54 TAIWAY LTD.	TWD 160,000,000	36.25
55 BEIJING NTN-SEOHAN DRIVESHAFT CO., LTD.	USD 6,000,000	40 (6.67)
56 Seohan-NTN Bearing CO., Ltd.	KRW 75,780,330,000	49
57 NTN-DONGPAI (Shanghai) Bearing Sales Co. Ltd.	USD 1,460,000	25 (25)
58 PT. TPI MANUFACTURING INDONESIA	USD 55,415,050	28.8 (0.002)
H NTN China Technical Center		

One consolidated subsidiary in addition to the Group companies above

● Sales ■ Production ■ Production and sales ◆ R&D base ● Others

3. Figures in curved brackets under "Holding as percentage" indicate the percentage of indirectly owned holdings, and are included in the total holding.  
 4. None of the companies has submitted a securities registration statement or securities report.  
 5. Of the above subsidiaries, NTN BEARING CORP. OF AMERICA and NTN-SNR have sales (excluding internal sales between consolidated companies) accounting for more than 10% of consolidated sales. Figures for NTN-SNR are consolidated figures encompassing eight NTN-SNR subsidiaries.  
 6. Of the above subsidiaries, ● to ● are NTN Corporation business units, 1 to 25 and 28 to 52 (in symbols ● ■ ■) are consolidated subsidiaries, and 26, 27 and 53 to 58 (in symbols ■ ■ ■) are affiliates subject to the equity method.



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