

FY2022 Sustainability Conference



NSK Sustainability Initiatives

December 20, 2022
NSK Ltd.





Contents

- 1. Sustainability at NSK**
- 2. Carbon Neutrality Initiatives**
- 3. Create New Value
with Bearings & Beyond**

1. Sustainability at NSK



Our business activities themselves, which are based on NSK's Corporate Philosophy, represents NSK's sustainability

NSK Corporate Philosophy (established in 1991)

NSK contributes to a safer, smoother society and helps protect the global environment through its innovative Technology integrating Motion & Control™.

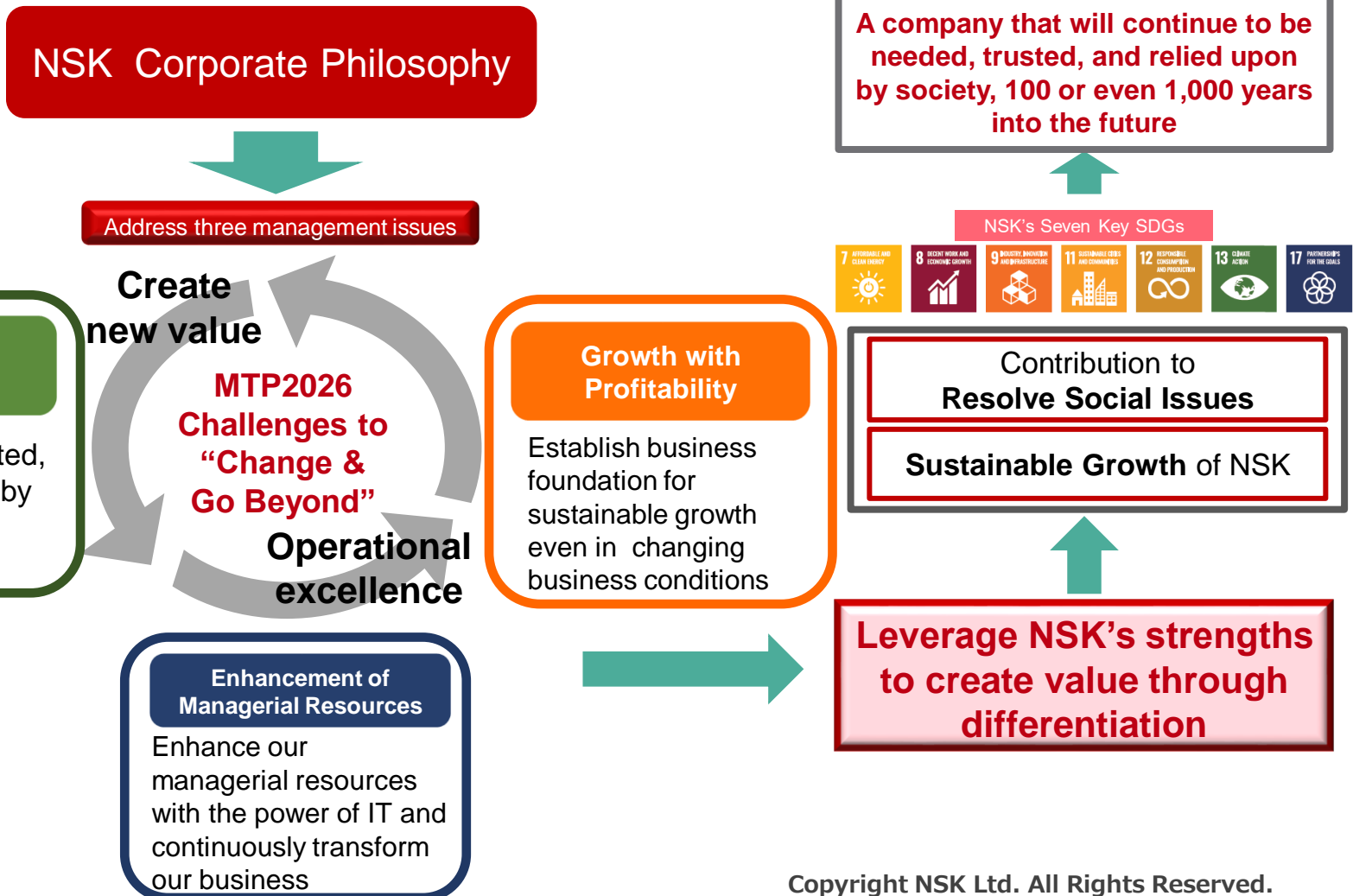
As a truly international enterprise, we are working across national boundaries to improve relationships between people throughout the world.

NSK's business domain
Social role
Contribution to the environment



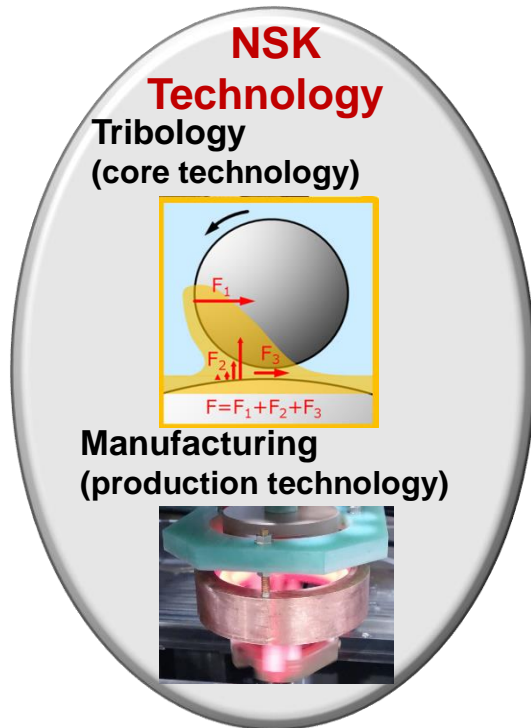
NSK Approach to Sustainability under MTP2026

Under MTP2026, we address three management issues, and aim to be a company that is needed and trusted, and that contributes to the development of a sustainable society



We contribute to the development of a sustainable society by creating new value through the fusion of tribology and digital technology

MOTION & CONTROL™



Increase value with fusion +

Digital Technology

Value created by NSK

Differentiating Technologies

- Lighter weight
- Reduced friction
- Reduced energy for production
- Prevention of breakage (high-durability)
- Residual life prediction (CMS)
- Low noise/vibration control
- Smooth movement (precision control)

- Safe, secure and comfortable mobility
- Extended travel range of EVs
- Improve productivity of plants and facilities
- Stable operation of facilities
- Effective use of resources
- Contribute to spreading of renewable energy and reducing CO₂ emissions of society

Abundant society

- Safe and secure to use
- Can be used with confidence
- Environmentally friendly
- Enhanced and more convenient (high functionality and performance)

Development of industry

Examples of various initiatives under MTP2026

Setting new targets under MTP2026, we are accelerating and promoting various initiatives

Environment



Achieve carbon neutrality by FY2035
(Scope 1 + 2)
Provide environmentally friendly products and services

Human Resources



Maximize human capital value
Diversity and inclusion
Promote work-style reforms

Quality



Ultra-stable production
Creating plants that never produce defective products, and are always in operation

Governance/ Compliance



Improve Governance of NSK Group
Deepening of dialogue with stakeholders

Safety



Creating a safe working environment
Prevention of serious accidents

Innovation



Strengthen the product appeal of existing products
Grow new products and businesses

2. Carbon Neutrality Initiatives



History of NSK Environmental Initiatives

Promoting environmental initiatives ahead of social trends since the 1980s

Social Trends

NSK Initiatives

1980s to 1990s
Global environmental problems

- 1987 Montreal Protocol
- 1992 Framework Convention on Climate Change
- 1997 COP3 Kyoto Protocol

- **1991 NSK Corporate Philosophy established**
- **1993 Global Environment Protection Committee established**
- 1997 NSK Environmental Policy established

2000 to 2009
Environmental management
Chemical substance management
Recycling-oriented society

- 2000 Basic Act on Establishing a Sound Material-Cycle Society
- 2003 Europe RoHS Directive
- 2007 Europe REACH Regulation

- **2004 Acquisition of ISO14001 certification at plants completed (in Japan)**
- 2006 Chemical substance management and green procurement strengthened
- 2008 NSK Eco-efficiency Indicators (Neco) introduced

2010s –
Climate change
Sustainable society

- 2015 COP21 Paris Agreement
- 2015 United Nations Sustainable Development Goals (SDGs)
- 2017 TCFD Final Report

- **2019 ESG management set as issue in mid-term management plan**
CO₂ emission reduction targets also established
- **2021 Carbon Neutrality Department established**
- **2022 Target for achieving carbon neutrality accelerated**

Acceleration of initiatives

NSK CO₂ Emission Reduction Initiatives

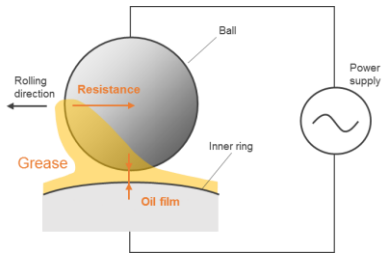
NSK promotes initiatives for reducing CO₂ emissions using the “Create and Utilize” approach

Environmental contribution using “tribology”

Deepen tribology technology to realize further energy savings
For example, development of electrical impedance method* using electrical circuit to visualize the inside of bearings

⇒ Contribute to reducing torque by making oil film as thin as possible

* Received Best Paper Award, Japanese Society of Tribologists



The oil film thickness is calculated by measuring the ease with which an electrical current flows.

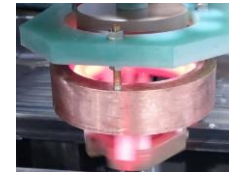
Reduce CO₂ emissions from business activities

Reduce CO₂ emissions from business activities through three measures: energy saving, technological innovation, and renewable energy

Coating plant roofs with thermal insulation paint



Improving efficiency of heat treatment

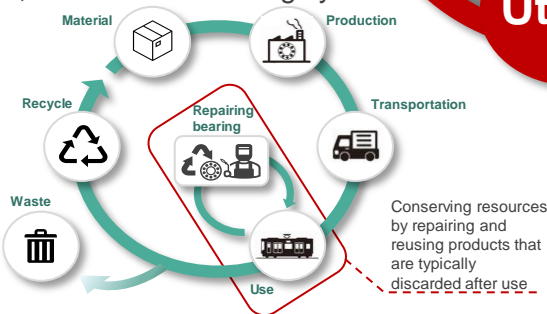


Adopting renewable energy



Environmental contribution utilizing CMS/reconditioning

Improve reliability and conserve resources by utilizing product lifespan diagnostics, condition monitoring system (CMS), and repair



Create

R&D

Production

Customer Support

Product

Utilize

Benefit the environment through our products

Contribute to reducing CO₂ emissions of society as a whole by providing environmentally-friendly products



Low-friction hub unit bearings



Ultra high-speed ball bearings for EV motors



Bearings for wind turbine gearboxes

NSK CO₂ Emission Reduction Targets and Progress

Aiming to achieve carbon neutrality in Scope 1 + 2 by FY2035
Promoting initiatives for targets using the “Create and Utilize” approach

	Main initiatives	Targets (for FY2026)	FY2021 results
Create Reduce CO ₂ emissions emitted by NSK	Energy conservation activities	<p>Reduce Scope 1 and 2 emissions by 50% (compared with FY2017)</p> <p>■ Reductions in CO₂ Emissions from Business Activities (Scope 1 and 2)</p> <p>Results FY2017 FY2026 FY2030 FY2035 FY2050 Targets</p> <p>CO₂ emissions avoided: More than 3 million t-CO₂ (exceeding the total of Scope 1, 2, and 3 CO₂ emissions for the NSK Group in FY2017)</p>	Progress: As planned Reduced 25.1% from FY2017 FY2017: 1.02 million tons FY2021: 760,000 tons
	Technology innovation		
	Renewable energy use		
Utilize Contribute to reducing CO ₂ emissions by incorporating NSK products into customer equipment and facilities	Contribute to CO ₂ emission reductions through products and services	<p>CO₂ emissions avoided: 3 million tons</p> <p>(1,000 t - CO₂)</p> <p>Legend: Indirect contribution (green), Direct contributions (blue)</p> <p>2017: 634 (indirect), 614 (direct) = 1,249 total 2018: 530 (indirect), 831 (direct) = 1,361 total 2019: 702 (indirect), 746 (direct) = 1,448 total 2020: 1,039 (indirect), 1,281 (direct) = 2,320 total 2021: 730 (indirect), 1,605 (direct) = 2,335 total 2026 Target: 3,000 total</p>	Progress: As planned Reduced 2.34 million tons (Breakdown) Direct contributions: 1.61 million tons Indirect contributions: 730,000 tons
	CMS + bearing repair ⇒ Realize product lifecycle management (PLM) business and contribute to recycling-oriented society		

“Create”—Energy Conservation and Technological Innovation Initiatives

Energy Conservation

- **Air-conditioning improvements** (introduce highly efficient equipment, thermal insulation paint)
- Reduce air usage in production processes
- Production energy visualization
→ Upgrade energy management

Example: Air-conditioning improvements

● Improve energy efficiency of air-conditioning equipment

Switch air conditioning heat source from gas to electricity (air-cooled heat pump)



Air-cooled heat pump

● Adopting thermal insulation paint

Switch from barrier paint to thermal insulation paint
Optimize air-conditioning efficiency in both summer and winter



Example of thermal insulation paint

Standardize demonstration results at model plants and share them with plants in and outside Japan

Technological Innovation

- Improve efficiency using **high-frequency induction heat treatment**
- 50% increase in productivity by engaging digital technology in all areas and super-stable production

Example: High-frequency induction heat treatment

Heat treatment processes account for 22% of total energy consumed in production processes. Heating the target parts only without heating the entire furnace **dramatically reduces energy consumption.**



Conventional heat treatment furnace

Heating the entire furnace



High-frequency induction heat treatment

Heating the target part only

Expand applicable products and gradually roll out to global plants

Renewable Energy Use

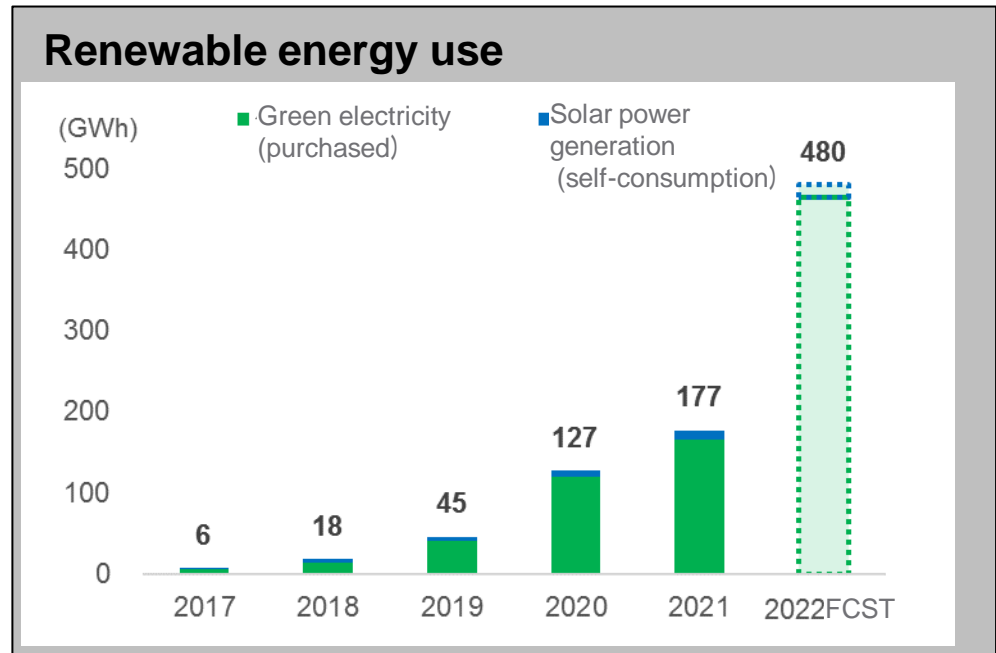
- Actively promote renewable energy procurement: Expand use of green electricity
- Expand installation of renewable energy facilities

<Expand use of green power>

- Switch to 100% green electricity completed at all production sites in Europe
- Accelerate introduction in Japan

<Install solar power generation facilities>

- Gradually expand installation of solar power generation facilities at global production and business sites



- Develop and provide products and services to contribute to reducing CO₂ emissions
- CMS + repairing bearing

<Direct contributions: Develop environmentally friendly products>

- Further pursuit of tribology

<Indirect contribution: Contribute to reducing CO₂ emissions by incorporating NSK products into customer equipment and facilities>

- Focus on **growth sectors** in a post-carbon society and launch NSK products and services that contribute to the environment with Bearings & Beyond

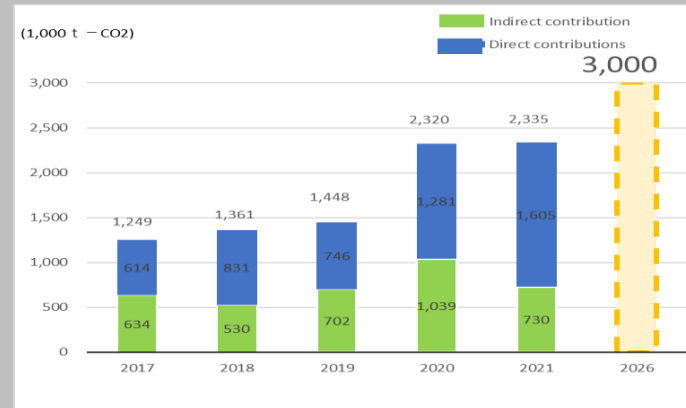
Disclose growth sectors which are “opportunities” identified through TCFD

2020: Announced endorsement

2021: Disclosed scenario analysis (risks and opportunities)

2022: Disclosed financial impact

CO₂ emissions avoided during the use of NSK products



Direct contributions: Direct contributions to CO₂ emissions reduction through individual NSK product performance*

Contribution calculation formula: CO₂ emissions avoided by a single NSK product × sales volume × years of operation

Indirect contribution: Indirect contributions through CO₂ emissions avoided by incorporating NSK products into customer equipment and facilities

Contribution calculation formula: CO₂ emissions avoided per unit × rate of contribution of NSK products × sales volume × years of operation

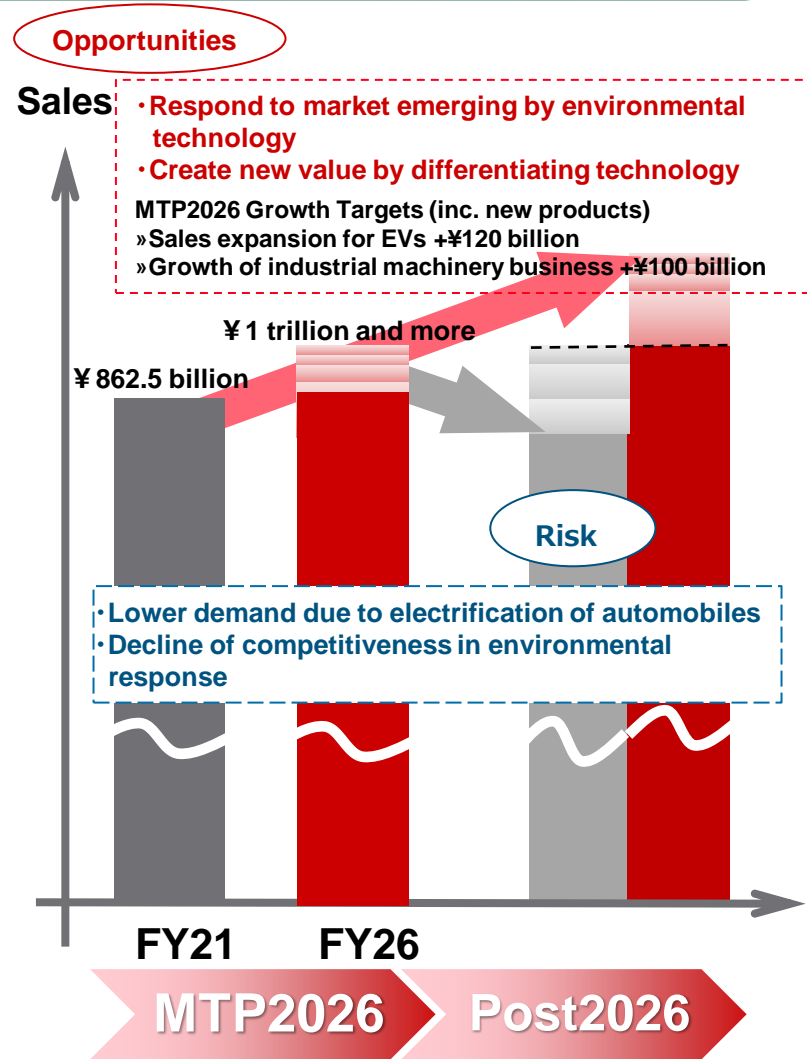
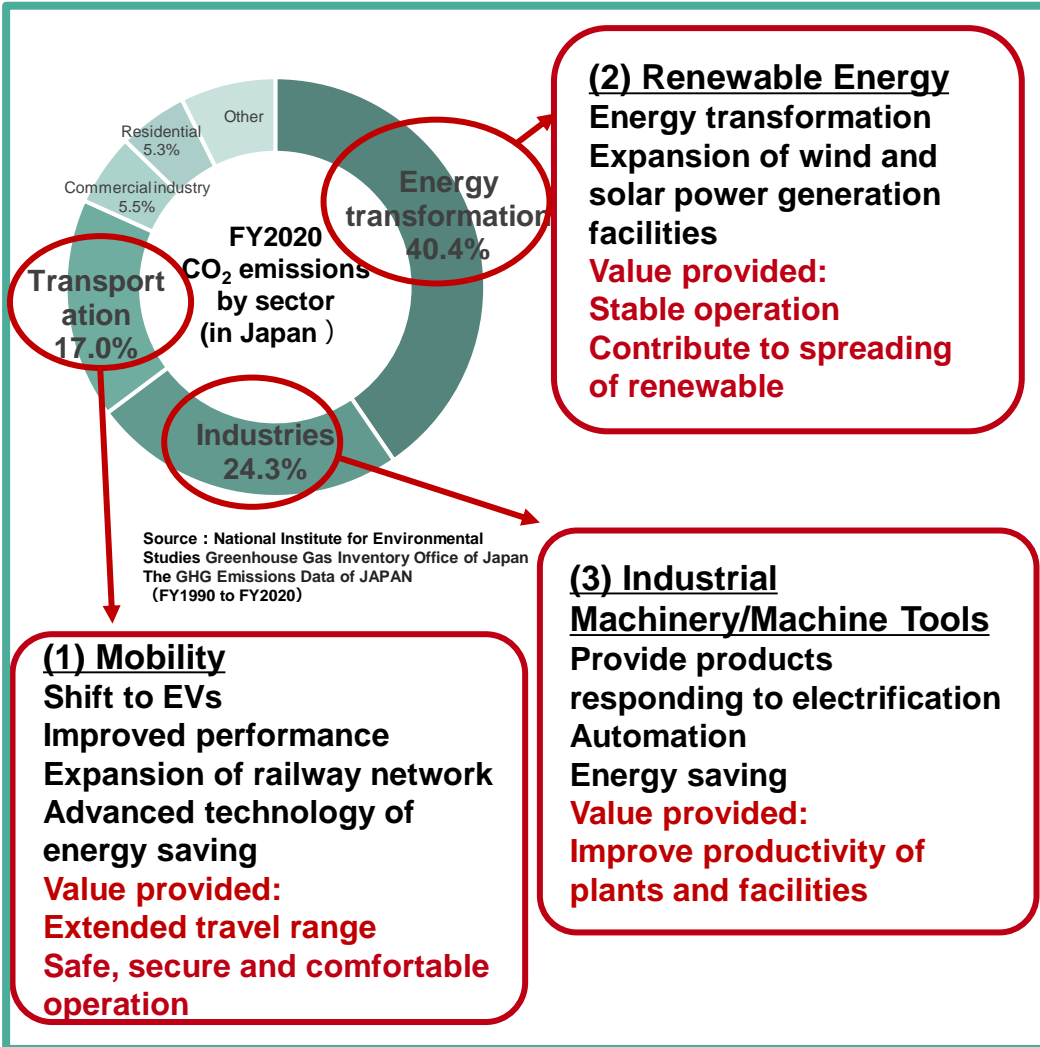
*The method for calculating contributions to reductions (direct contributions) follows the “Guidelines for Quantifying CO₂ Emissions Avoided by Use of Bearings” published by the Japan Bearing Industry Association.

3. Create New Value with Bearings & Beyond



Expanding Growth by Contributing to a Decarbonized Society with Bearings & Beyond

Transition to a decarbonized society is a growth opportunity for NSK



Support for EVs



Ball screws for electric-hydraulic brake systems

Ultra-high-speed ball bearings



Low-friction hub unit bearings



Single pinion EPS for EVs



Ceramic ball bearings

Traction drive speed reducer



Differentiation:

Reduced friction, Reduced size and weight, High-durability, High output, High-speed, Low noise

Value provided: Extended travel range of EVs

Railways

Vibrator control actuator for railcars



Wheelset bearings



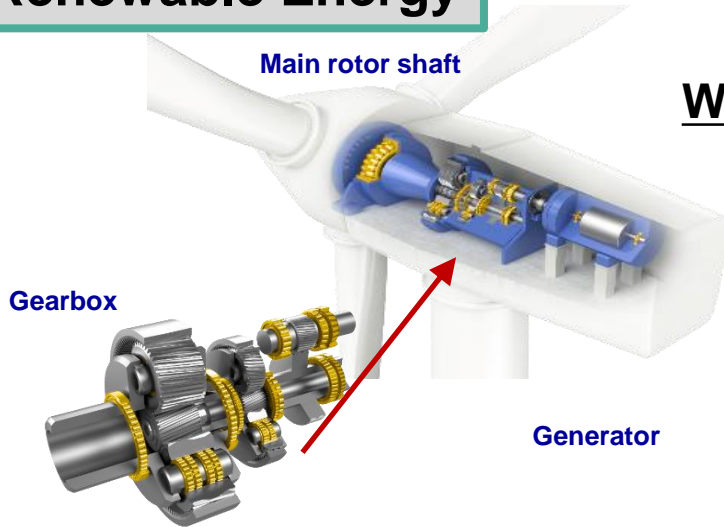
Differentiation:

Low noise/vibration control, Reduced friction, High-durability

Value provided: Safe and secure operation, Comfortable ride

Focus on Growth Areas: Value Provided in (2) Renewable Energy and (3) Machine Tools

Renewable Energy

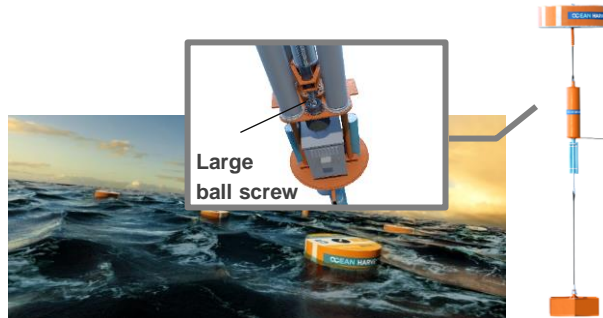


Wind turbines

Provide a variety of high functional bearings that meet the needs for enlarged size and long-term suitable operation

Wave power generator

A system to capture the power of waves on the ocean. The nuts of the ball screws built into the device move up and down with the motion of the waves, generating power.



Images provided by Ocean Harvesting Technologies AB

Differentiation:

Reduced friction, Prevention of breakage(High-durability)

Value provided:

Stable operation, Contribute to spreading of renewable energy

Machine Tools

ROBUSTGRD™

seizure-resistant grease for machine tool spindle bearings



Ball screws for next-generation high-accuracy machine tools



Differentiation:

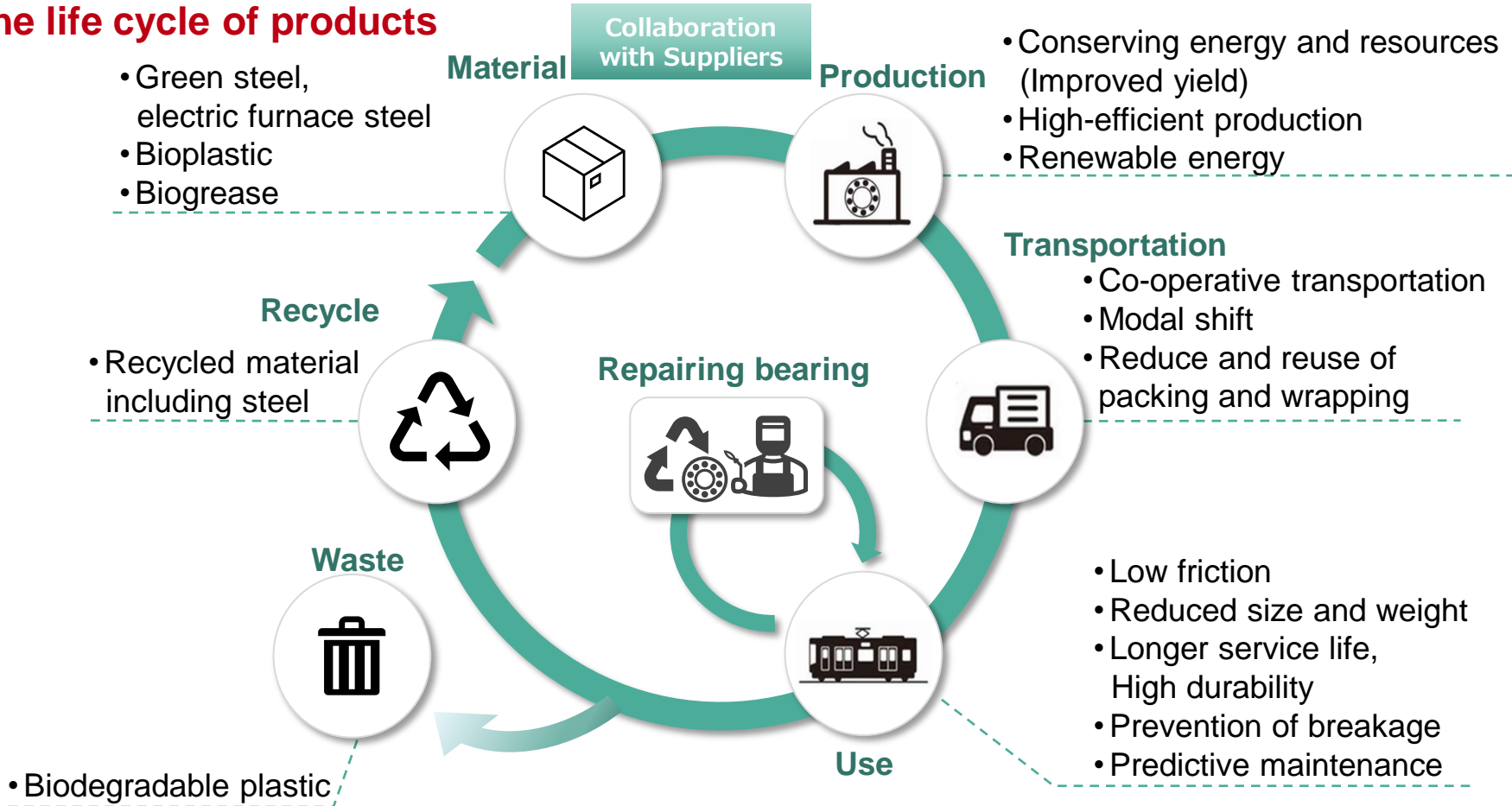
Reduced friction, Low noise, High-durability, Reduced energy for production, Smooth movement (precision control)

Value provided:

Stable operation of facilities, Improved productivity

NSK provide solutions throughout the life cycle of products and help to create a sustainable society

Value Provided: Contribute to reducing CO₂ emissions of society throughout the life cycle of products



New Value Provided with Bearings & Beyond

Creating new value to resolve social issues, we aim to achieve sustainable growth of NSK

Industrial Machinery Business

Spread of automation, electrification, and predictive maintenance technologies

Acceleration of energy transition



Active casters



"Broaden CMS"
Synergies with BKV

Expand hydrogen-related businesses

Sales target:
¥50.0 billion

Electric Actuators
Construction/agriculture etc.



Food oil deterioration
suppression filter



FY2026

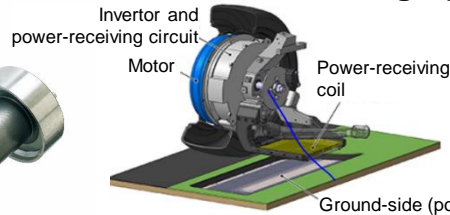


Post2026

Expand sales of
ball screws for
electric-hydraulic
brake systems:
10 million units/ year



In-Motion wireless charging



Non-contact
torque sensor



Traction drive
speed reducer



Automotive Business

Spread of HEVs/EVs

Shift to EVs

Improved EV driving
performance



We will set the future in motion by practicing “Change & Go Beyond.”

Highly Evaluated by Outside Agencies (SRI/ESG) (As of December 2022)

Member of
**Dow Jones
Sustainability Indices**

Powered by the S&P Global CSA



FTSE4Good *1



FTSE Blossom
Japan *2



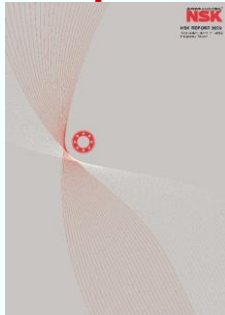
FTSE Blossom
Japan Sector
Relative Index *3

2022 CONSTITUENT MSCI JAPAN
EMPOWERING WOMEN INDEX (WIN) *4



Please also see NSK Report and our website for sustainability information.

NSK Report 2022



Sustainability Website



Cautionary Statements with Respect to Forward-Looking Statements

Statements made in this report with respect to plans, strategies and future performance that are not historical fact are forward-looking statements. NSK cautions that a number of factors could cause actual results to differ materially from those discussed in the forward-looking statements.

Note : This document is an English translation of material written initially in Japanese. The Japanese original should be considered the primary version.

*1 : FTSE Russell (the trading name of FTSE International Limited and Frank Russell Company) confirms that NSK has been independently assessed according to the FTSE4Good criteria, and has satisfied the requirements to become a constituent of the FTSE4Good Index Series. Created by the global index provider FTSE Russell, the FTSE4Good Index Series is designed to measure the performance of companies demonstrating strong Environmental, Social and Governance (ESG) practices. The FTSE4Good indices are used by a wide variety of market participants to create and assess responsible investment funds and other products.

*2 : FTSE Russell (the trading name of FTSE International Limited and Frank Russell Company) confirms that NSK has been independently assessed according to the FTSE Blossom Japan Index criteria and has satisfied the requirements to become a constituent of the FTSE Blossom Japan Index. Created by the global index provider FTSE Russell, the FTSE Blossom Japan Index is designed to measure the performance of companies demonstrating strong Environmental, Social and Governance (ESG) practices. The FTSE Blossom Japan Index is used by a wide variety of market participants to create and assess responsible investment funds and other products.

*3 : FTSE Russell (the trading name of FTSE International Limited and Frank Russell Company) confirms that NSK has been independently assessed according to the FTSE Blossom Japan Sector Relative Index criteria and has satisfied the requirements to become a constituent of the FTSE Blossom Japan Sector Relative Index. Created by the global index provider FTSE Russell, the FTSE Blossom Japan Sector Relative Index is designed to measure the performance of companies demonstrating strong Environmental, Social and Governance (ESG) practices. FTSE Blossom Japan Sector Relative Index indices are used by a wide variety of market participants to create and assess responsible investment funds and other products.

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