Values and Aspirations

The world of Motion Control Transformed by a Single Invention

The innovative idea and the unique principle of HarmonicDrive® are the brainchild of a brilliant American inventor, C. W. Musser. Making use of the deflection of metal, Musser's invention defied the conventional wisdom and instantly became the object of worldwide interest at the time as a revolutionary method of conveying motive power. Two companies stepped forward to take a chance at commercializing this concept. One was USM (United Shoe Machinery Corporation) in the U.S., and Hasegawa Gear Works, Ltd., the forerunner of Harmonic Drive Systems Inc. Subsequently, HarmonicDrive® was successfully commercialized for the first time in Japan. Currently, the technology fulfills the needs of various domains that require positioning accuracy. The management philosophy of Harmonic Drive Systems demonstrate our values and reflect various aspirations behind the realization of Total Motion Control.

Unchanging goals that we want to achieve through corporate activities

Management Philosophy

Respect for the Individual

HDSI aspires to be a company where the rights of every individual employee are respected, and where individuals can pursue a meaningful, cultural, and worthwhile life.

We will make HDSI a company that believes in each employee's aspirations, supports independent activities, and creates an environment where employees can maximize their abilities through work, and where abilities and performance are rewarded.

A Meaningful Company

HDSI wants to be recognized as a meaningful, superior company which manifests creativity, has personality and distinctive characteristics, and whose management foundation is based on ceaseless research and development activities and a constant emphasis on quality—a company where the entire organization finds meaning in making utmost efforts.

Coexistence and Co-prosperity

HDSI is supported by many different parties including our employees, customers, shareholders, materials and parts suppliers, affiliated companies, and trading partners.

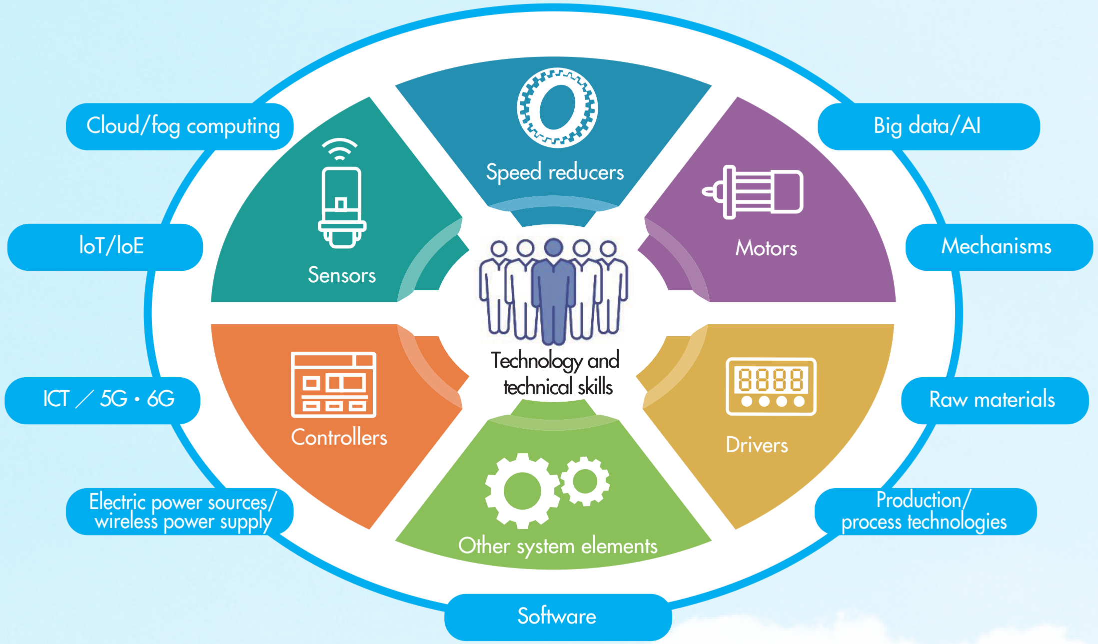
We make our best efforts to create attractive products, services, compensation, working environments, and trading relations to satisfy all these concerned parties.

Contribution to Society

HDSI broadly contributes to society and industry through our corporate activities as a good corporate citizen.

The products and services we provide directly and indirectly contribute to the betterment of society. We aspire to be a company that helps improve the environment and the quality of the communities where we are located.

Provision of total motion control



Pursuit of superior actuators

— Mission —

To contribute to innovation in the society by our motion control technology

— Long-term Vision —

The best provider of total motion control in harmony with the future

Greetings from Our New Leadership

We will continue to maintain our leading position as the best provider in harmony with the future

Akira Nagai
Chairperson of Board of Directors

Akira Maruyama
President and CEO

Our Management Philosophy

The Harmonic Drive Systems Inc. (HDSI) Management Philosophy comprises four pillars: "Respect for the Individual," "A Meaningful Company," "Coexistence and Co-prosperity," and "Contribution to Society." This Management Philosophy was devised during HDSI's early days and passed down as part of our corporate culture to the present day. It is also the foundation that will underpin the Harmonic Drive Systems (HDS) Group's continued survival and further development going forward. We designated "Respect for the Individual" as our first pillar, and as this suggests, the Group considers human capital to be our most important form of management capital. In fact, we set "maximization of the value of human capital" as the most important of materiality forming the basis of our Medium-Term Management Plan that began in fiscal 2024. To realize our Medium-Term Management Plan we must meet customer expectations by means of high quality and technical expertise. In our development and manufacturing, we must be unafraid of failure, instead allowing human resources with innovative ways of thinking to generate knowledge and ideas of all kinds. We must also deliver customer satisfaction in terms of cost, service, and delivery schedules and it is the employees comprising our human capital who are interacting with customers at the forefront of efforts to deliver in these areas. At the same time, the Group's products would not even be made if it were not for the members of the HDS Kyoryokukai (HDS Cooperative Association) and our other suppliers. Our relationships of Coexistence and Co-prosperity with suppliers are set to become increasingly important. We are convinced that it is this provision of new value founded on our Management Philosophy that will enable us to contribute to the sustainability of society.

Realizing our long-term vision

Before settling on our long-term vision of "The best provider of total motion control in harmony with the future," we discussed what kind of company we aspire to be in 2030. We reached a consensus on the quantitative targets of ¥100.0 billion or more in net sales and 20% or more in operating income to net sales ratio. One example of a new growth field that could drive our achievement of these targets is the growing humanoid robot market. Likewise, industrial robotics is another field in which we should ensure that we grasp similar opportunities for future growth, given the anticipated evolution in co-robots, among other developments. In particular, our customers that manufacture humanoid robots often come to us with ideas for new markets and applications based on AI (i.e., "artificial intelligence"). Such ideas presage the emergence of customer needs beyond what we ourselves can currently predict. We will address such needs by continuing to maintain our leading position in the precision speed reducer market and seeking to remain the best provider. In doing so, we believe that it will be essential to avoid pursuing short-term profits and instead to make appropriate investments based on a medium- to long-term perspective.

Our sustainability activities

Demands on companies to engage with sustainability look set to increase even further. This being the case, we need to clearly identify sustainability initiatives that align with the requirements of our customers and other stakeholders and implement such initiatives reliably. At HDSI, there are some things we do that contribute to sustainability in ways we ourselves are often unaware of. One example would be our handling of employees' suggestions for improvements. We give the employees feedback on the outcomes of their suggestions and inform everybody in the Company of suggested initiatives' potential contribution to sustainability. However, we believe it is important not to focus solely on implementing sustainability activities as an end in itself, but to respond appropriately to what the wider society actually wants of us and take action that is meaningful.

Last year, after we produced HDS Report 2023, our first integrated report, we received a great deal of feedback from shareholders, investors, and other stakeholders. We are gratified that we succeeded in helping stakeholders to better understand the Group's business activities and future direction by including a range of perspectives, not only from top management, but also from officers in charge of each section, as well as from young employees and Outside Directors.

On June 21, 2024, we transitioned to a new management structure. The current management team will continue making a concerted effort to enhance the Company's corporate value. We would greatly appreciate your support as we do so.

Chairperson of Board of Directors Akira Nagai

President and CEO Akira Maruyama

Contents / Editorial Policy / Information Disclosure

Information Disclosure System

Financial Information | **Sustainability Information**

Company Guide
Integrated Report
Corporate Website

Financial Information:
- IR information (Corporate website)
- Securities Report, Semiannual Report
- Financial Results, Presentation of Business Results
- Investors' Guide
- Materials for briefing sessions for individual investors

Sustainability Information:
- Sustainability information (Corporate website)
- Information on products, technologies, exhibitions (Corporate website)
- Corporate Governance Report

Our website

Access our website for detailed information including financial information, such as Financial Results, Presentation of Business Results, as well as sustainability information.

Investor Relations | Harmonic Drive Systems

Sustainability | Harmonic Drive Systems

Harmonic Drive Systems 50th anniversary

Contents

Editorial Policy

This HDS REPORT 2024 aims to deepen the understanding of wide-ranging stakeholders, including shareholders and investors, by explaining the medium- to long-term economic value generated by the HDS Group, as well as the HDS Group's Management Philosophy, long-term vision, business models, capital and strengths forming the source of its competitive edge, sustainability promotion system, etc., to improve social and environmental values. In compiling this report, we referred to IFRS Foundation's International <IR> Framework, the Ministry of Economy, Trade and Industry's "Guidance for Collaborative Value Creation," and other relevant guidelines.

Scope of reporting

Entities reported: Harmonic Drive Systems and its Group companies included in the scope of consolidation and those accounted for by the equity method.
Period reported: this report covers mainly fiscal 2023 (from April 1, 2023, to March 31, 2024). Notes, etc., are inserted where any other period is mentioned.
Terms used to refer to the Company and its Group: In this report, "HDSI" or the "Company" refers to Harmonic Drive Systems alone, while "HDS Group" or the "Group" is used to refer to the Company and its Group companies.

Notes on forward-looking statements

Forecasts and outlook regarding future financial results indicated in this integrated report are what the Company judged as reasonable based on currently available information. Note that such forecasts contain risk and future uncertainty, and actual achievements and financial results may differ from them.

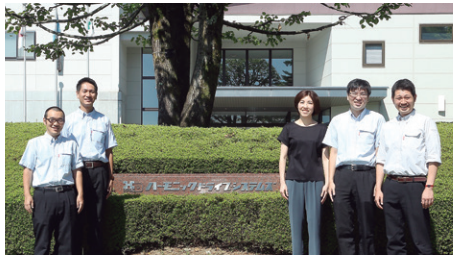
HDS REPORT 2024 Key Topics

1 Introducing Our New President & CEO and Chairperson of the Board

The new President & CEO and Chairperson of the Board share their commitment to the Management Philosophy that has been passed down over many years and their aspirations embedded in the newly established long-term vision.

The new President & CEO leading the HDS Group outlines his aspirations and strategies for achieving the long-term vision and the Medium-Term Management Plan.

2 Launch of Medium-Term Management Plan for fiscal years 2024-2026



This section details the overview of the Medium-Term Management Plan for fiscal years 2024-2026 launched under the new management structure.

The next generation leaders of our Group gather to discuss the on-the-ground efforts and challenges to achieve the Medium-Term Management Plan and long-term vision.

3 Messages from the Top Leaders of the Overseas Group Companies with a Deep Understanding of the HDS Group

Top leaders of four key overseas companies of the HDS Group's global network share their individual visions, strategies, and strengths.

4 Expectations and Challenges for the Sustainable Growth of the HDS Group: Insights from the Outside Directors and Outside Corporate Auditors

The Outside Directors and Outside Corporate Auditors engage in a candid discussion on business strategies for the sustainable growth of the HDS Group, as well as challenges and expectations regarding internal controls and governance enhancement. The officers discuss about the roles of the Nomination and Remuneration Advisory Committee (voluntary committee) established in March 2024.

Our Products

MECHATRONICS

Mechatronics products

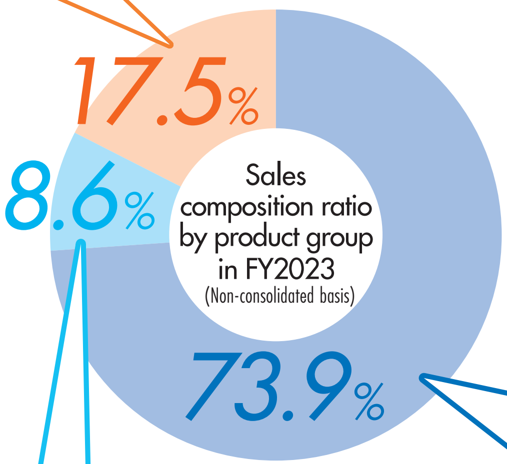
Production base Harmonic Winbel Inc. (Komagane-shi, Nagano)

In order to take advantage of the excellent angle transmission precision and positioning precision of HarmonicDrive®, we offer total motion control, including AC, DC, and step actuators capable of ultra-high resolution and high-precision rotary motion, and linear actuators capable of ultra-fine volume and high-precision linear motion.

SHA series
AC servo actuator
Flat hollow shaft type

RH series
DC servo actuator

LA series
AC servo linear actuator



HarmonicDrive®

Strain-wave gearing

Production base Hotaka Factory/Ariake Factory (Azumino-shi, Nagano)

The HarmonicDrive® consists of only three basic components. Unlike motions of ordinary gearing, the unique tooth behavior (operating principle) of HarmonicDrive® achieved nonbacklash motion, infinitesimal angular feeding (one-pulse feeding) and high positioning repeatability.

Wave Generator

The wave generator consists of a thin ball and bearing that fit into the outer circumference of the elliptical cam. The inner ring of the bearing is fixed to the cam, while the outer ring deforms elastically via the ball. Normally, this is installed on the input shaft.

Flexspline

This is the thin, cup-like, metallic, and elastic body. The outer circumference of the opening has the teeth. The bottom of the flex spline (bottom of the cup shape) is referred to as the diaphragm, and is installed on the output shaft in the normal fashion.

Circular Spline

This is the rigid and ring-shape component. The inner circumference has the teeth, and the number of teeth is higher than the flex spline by two teeth. Normally, it is fixed to the casing.

HarmonicPlanetary®

Precision planetary speed reducers

Production base Harmonic AD, Inc. (Azumino-shi, Nagano)

HarmonicPlanetary® is a Precision planetary speed reducers that utilizes the accumulated precision machining expertise of HarmonicDrive® at lower reduction ratios. With a unique backlash elimination function, it achieves high rotational precision.

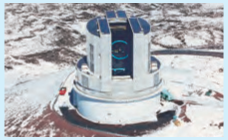
HPG-R series
Gearhead

Product Applications

Hayabusa; Hayabusa2

Courtesy of Japan Aerospace Exploration Agency (JAXA)

Large-scale optical/infrared telescope "Subaru"



Courtesy of Inter-University Research Institute Corporation, National Institutes of Natural Sciences, National Astronomical Observatory of Japan

Collaborative Robot(Co-bot)

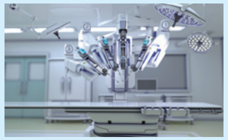
Courtesy of Techman Robot Inc.

eVTOL (flying cars)

Power assist suits

Courtesy of Hashimoto Laboratory of Shinshu University

Surgical robots



Mars rover "Perseverance"

Courtesy of NASA/JPL-Caltech

Semiconductor wafer transport robots

Courtesy of DAIHEN Corporation

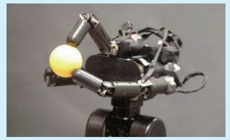
Automated guided vehicles (AGVs)

Industrial robots

Mobility vehicles

Courtesy of Lean Mobility Co., Ltd.

Small robot finger module



Courtesy of Ishikawa Group Laboratory of the University of Tokyo

Corporate History

HDSI : Harmonic Drive Systems Inc.
HDSGmbH : Harmonic Drive GmbH (Germany) (Currently, Harmonic Drive SE)
HDL : HD Logistics, Inc.
HPI : Harmonic Precision Inc.
HAD : Harmonic AD, Inc.
HDLLC : Harmonic Drive L.L.C (the U.S.)
WB : Winbel Co., Ltd. (Currently, Harmonic Winbel Inc.)
HDSE : Harmonic Drive SE (Germany)
HDCH : Harmonic Drive Systems (Shanghai) Co., Ltd. (China)
ADM : SAMICK ADM CO., LTD. (South Korea)

1911-1978 Birthing Period・Foundation Period

1911-1969 Birthing Period

"Birth of HarmonicDrive®"

1911 Kiyoharu Hasegawa established Hasegawa Gear Works, Ltd.
1955 C. W. Musser invented HarmonicDrive®
1964 Hasegawa Gear Works and USM (the U.S.) signed a technological partnership agreement
1965 Completed the first HarmonicDrive® unit

1970-1978 Foundation Period

"Established Harmonic Drive Systems Inc."

1970 Established a J/V company, HDSI Established HDSGmbH in Germany
1976 Joined the umbrella of USM (the U.S.)
1977 Began manufacturing and selling mechatronics products

1979-1997 Expansion Period・Independence Period

1979-1988 Expansion Period

"Expanded a factory and entered the U.S."

1985 Expanded Matsumoto Factory (currently, Toyoshina Factory)
1987 Established HD Systems, Inc. in the U.S.

1989-1997 Independence Period

"Became independent from foreign capital"

1989 Established new HDSI as a wholly owned subsidiary of former HDSI
1990 Completed Hotaka Factory Established HDS Cooperative Association

1998-2013 Development Period・Stabilization Period

1998-2006 Development Period

"Listed shares for over-the-counter trading and enhanced supply chain"

1998 Listed shares for over-the-counter trading
1999 Established HDL (logistics company)
Established HPI (J/V) (producing cross roller bearings)
2000 30th anniversary
2003 Established HAD (manufacturing of HarmonicPlanetary®)
2004 Listed on JASDAQ
2005 Established HDLLC in the U.S.

2007-2013 Stabilization Period

"Enhanced presence in Asian markets and mechatronics products"

2007 Formed a capital and business alliance with WB (for developing actuators)
Made HPI a wholly owned subsidiary
2008 Formed a capital and business appliance with Ome Iron Casting Co., Ltd. (manufacturing high-strength cast-iron products)
2010 40th anniversary
2011 Established HDCH (Chinese sales company)
2013 Established ADM (Korean manufacturing company)

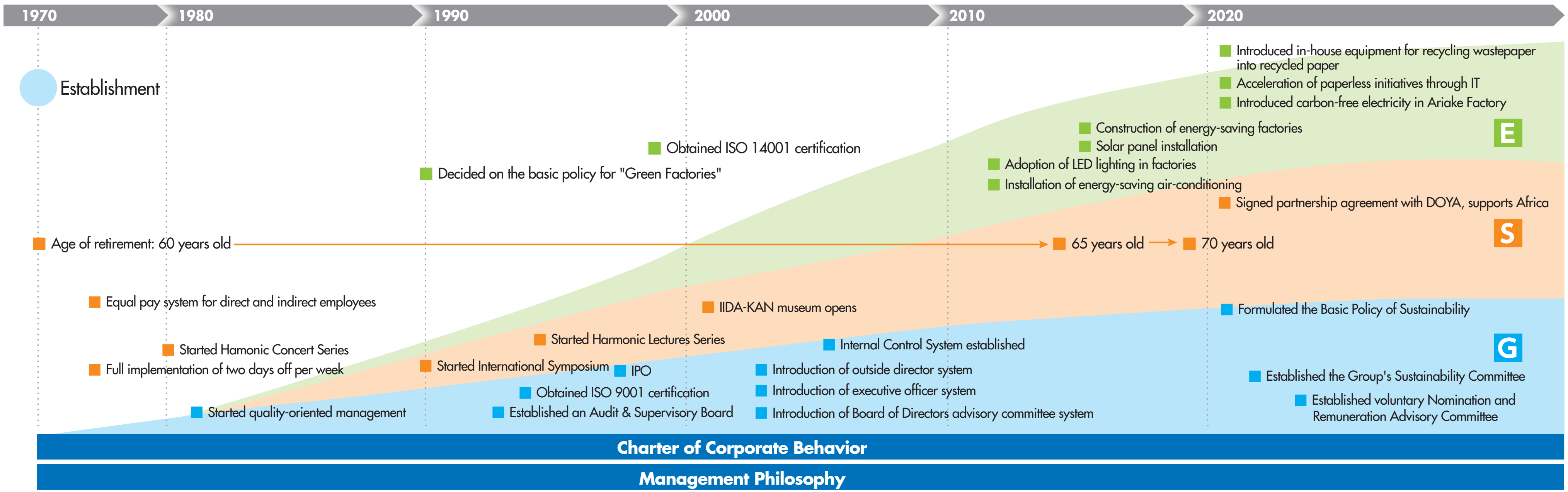
2014- Current Investment in Future Period

2014- Current Investment in Future Period

"Enhanced corporate fundamentals and supply structure for the future"

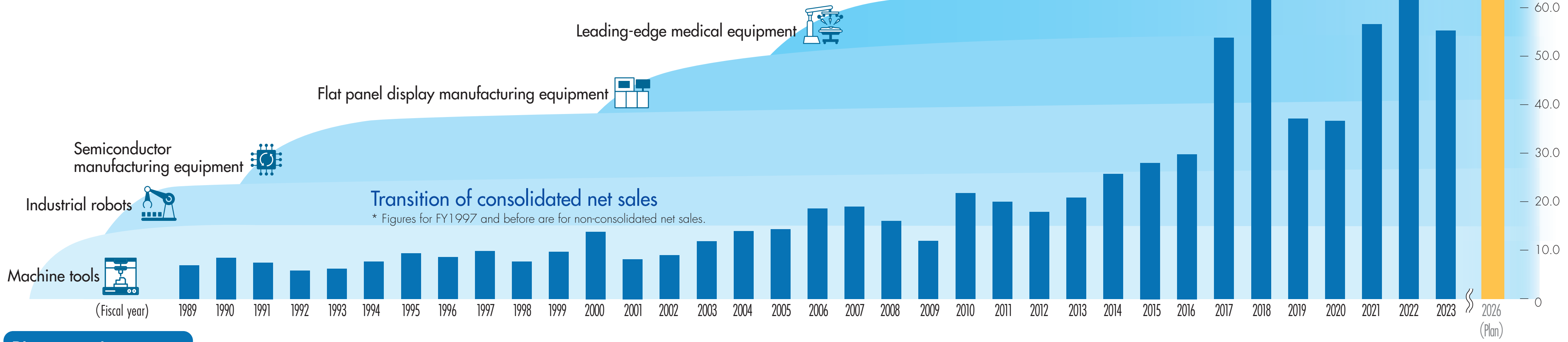
2014 Invested in enhancing production capacity of Hotaka Factory
2016 Opened Taiwan Representative Office
2019 Completed HPI's new factory
Completed new Ariake Factory
2020 50th anniversary
2021 Made HDLLC a wholly owned subsidiary
Made HDSE a wholly owned subsidiary
Made WB a wholly owned subsidiary

Our ESG efforts to improve the corporate value



Milestones in Value Creation

The HDS Group has achieved its growth and expansion through its contribution to diverse technological innovations in the industry, through HarmonicDrive®, Harmonic-planetary®, precision planetary speed reducers, and the provision of mechatronics products which integrates system elements such as motors, sensors, drivers, controllers, and others. We will continue to refine the technologies of Total Motion Control in order to meet the expanding applications.

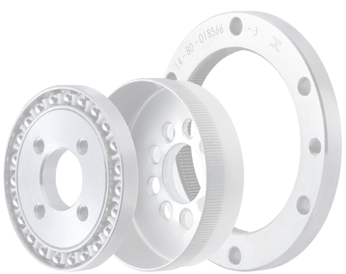


Diverse product groups

Strain-wave gearing HarmonicDrive®

- **1965** • Completed first unit made in Japan
- **1972** • Launched FD series differential unit for phase fine-tuning
- **1977** • Birth of R series (initial product)
- **1985** • Launched model number 5 products
- **1988** • Launched CSS series with a new IH tooth profile
- **1992** • Launched CSF series
- **1995** • Launched silk hat type SHF series
  • Established production technology of cross roller bearings
- **1999** • Developed units with a reduction ratio of 1/30
  • Launch larger torque capacity, longer life CSG series
- **2001** • Launched ultra-thin CSD series
- **2002** • Launched larger torque capacity, longer life SHG series
- **2006** • Launched CSF-3 micro precision speed reducer
- **2015** • Launched CSF-mini ultra flat, high stiffness type (2UP)
- **2020** • Launched ultra-light ULW
- **2023** • Launched CSD-ULW
- **2023** • Added model number 7 to small unit types

Mechatronics products MECHATRONICS



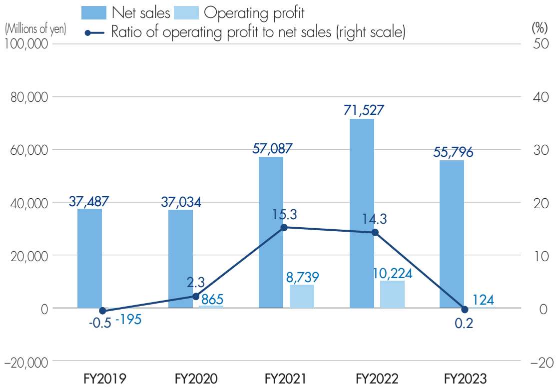
- **1978** • Commercialized Hi-T Drive
- **1984** • Launched high power DC servo actuator RH series
- **1987** • Launched DC servo actuator RH mini series
- **1989** • Launched LA-30 linear actuator
- **1990** • Launched FHA-25A FH2000 series servo actuator
- **1994** • Launched LSA-50A for laser scanners
- **2000** • Launched FH2000 series C type
- **2006** • Launched RSF-3 micro AC servo actuator
- **2009** • Launched new SHA series flat hollow actuator
- **2018** • Launched FLA series ultra flat brushless DC actuator
- **2018** • Launched HMA series flat and hollow AC servo motor
- **2025** • Addition of ULW type to the FHA-C mini series (planned)

Precision planetary speed reducers HarmonicPlanetary®

- **1988** • Launched BP series
- **1990** • Launched HP series
- **1999** • Launched HPG series
- **2007** • Added right angle type to HPG series
- **2015** • Launched HPG series helical gear type
- **2017** • Launched HPN series
- **2023** • Added model number 40 to HPG series helical gear type

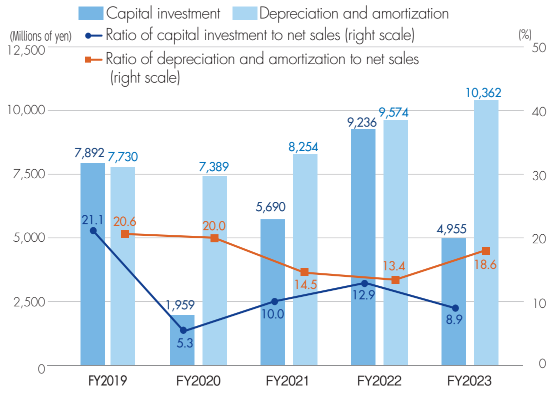
Financial Highlights

Net sales, Operating profit, and Ratio of operating profit to net sales



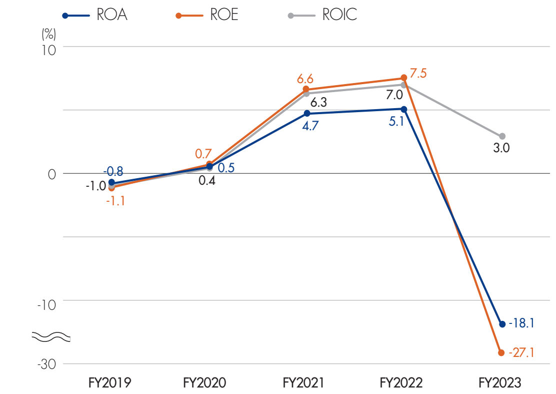
The net sales for fiscal 2023 amounted to ¥55,796 million, a decrease of 22.0% from the previous fiscal year, impacted by the continued stagnation of the domestic order from the previous fiscal period. Operating profit decreased 98.8% compared to the previous fiscal year to ¥124 million, due to an increase in depreciation and amortization as a result of investments to expand production capacity, as well as the decline in the operating rate of domestic production factories.

Capital investment, Depreciation and amortization, Ratio of capital investment to net sales, and Ratio of depreciation and amortization to net sales



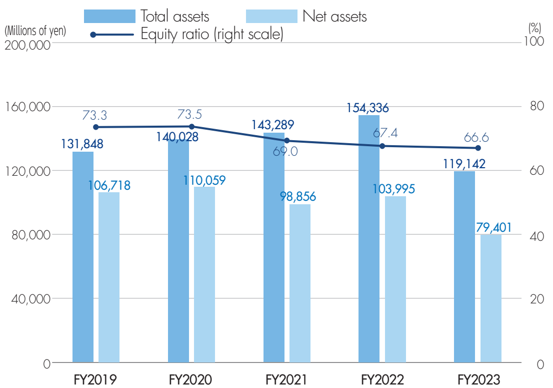
The capital investment decreased 47.5% compared with the previous fiscal year to a total of ¥4,955 million (¥3,548 million for Japan, ¥942 million for Europe, ¥465 million for North America). The three-year cumulative capital investment for the previous Medium-Term Management Plan for fiscal years 2021-2023 amounted to a total of ¥19,881 million, exceeding the plan (¥15,000 million) by 32.5%. Depreciation and amortization, including intangible, increased by 8.2% compared with the previous fiscal year to ¥10,362 million.

ROA, ROE, and ROIC



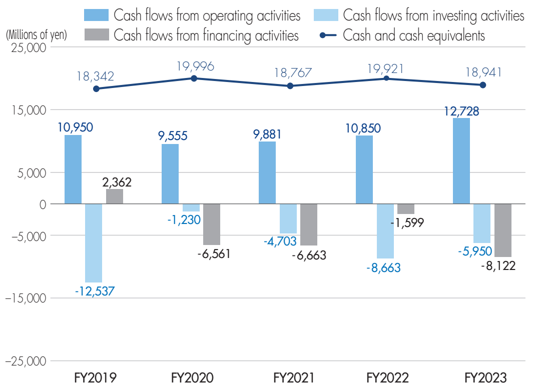
Return on equity (ROE) decreased by 34.6 percentage points to -27.1%, return on assets (ROA) decreased by 23.2 percentage points to -18.1%, and return on invested capital (ROIC) decreased by 4.5 percentage points to 3.0%, all from the previous fiscal year. The major reason for the decline in each profit ratio in fiscal 2023 is the recording of ¥28,159 million for impairment losses on intangible assets related to the consolidated subsidiary, Harmonic Drive SE.

Total assets, Net assets, and Equity ratio



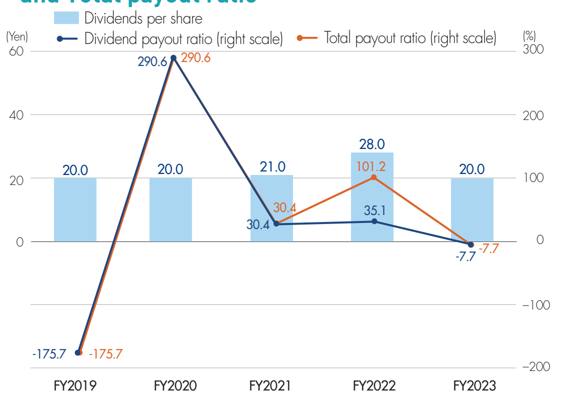
At the end of fiscal 2023, total assets decreased ¥35,193 million from the previous fiscal year end to ¥119,142 million, and net assets decreased ¥24,553 million from the previous fiscal year end to ¥79,401 million. Equity ratio dropped 0.8 percentage points from the end of the previous fiscal year to 66.6%. The major reason for this is the recording of ¥28,159 million for impairment losses on intangible assets related to the consolidated subsidiary, Harmonic Drive SE.

Cash flows, and Cash and cash equivalents



In terms of cash flows, operating activities provided net cash of ¥12,728 million, increasing by ¥1,878 million from the previous fiscal year, while investing activities used net cash of ¥5,950 million. Financing activities used net cash of ¥8,122 million, and cash and cash equivalents at fiscal year-end came to ¥18,941 million.

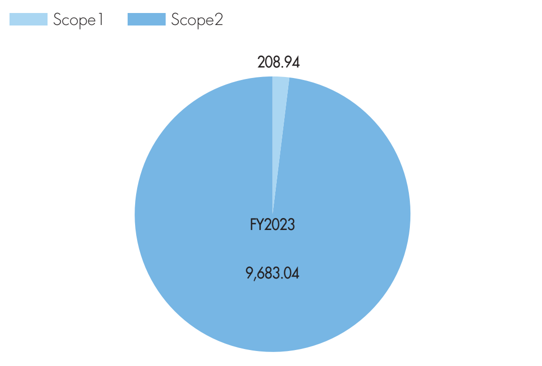
Dividends per share, Dividend payout ratio, and Total payout ratio



Dividends per share decreased ¥8 from the previous fiscal year to ¥20 (¥10 interim and ¥10 year-end), and dividend payout ratio was -7.7%, while ratio of total amount of dividends to net assets was 2.1%. A dividend payout ratio of 30% is our basic dividend policy. In the event of significant short-term fluctuations in performance, we will consider stable dividend payments while pursuing a flexible capital policy.

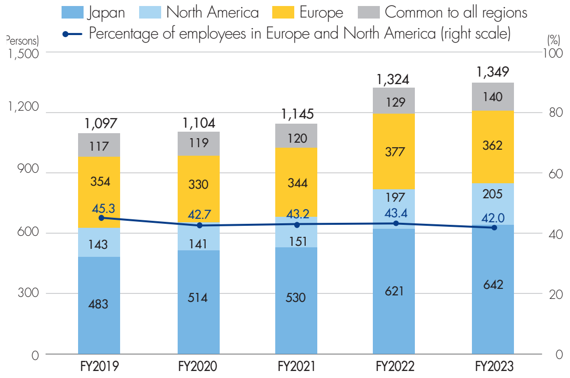
Sustainability Indicators Highlights

Greenhouse gas (GHG) emissions (t-CO_2)



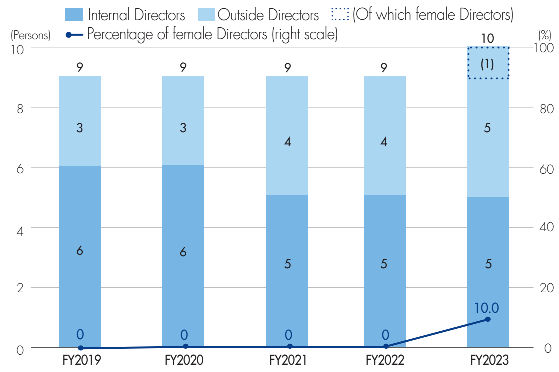
We began disclosing greenhouse gas (GHG) emissions on a consolidated bases with the figure from fiscal 2022. For fiscal 2023, the Scope 1 emissions totaled 208.94 t-CO_2, while Scope 2 emissions (location-based) totaled 9,683.04 t-CO_2, with a combined total of 9,891.98 t-CO_2. The data on Scope 1 and Scope 2 GHG emissions for fiscal 2023 has undergone third-party verification by an external organization.

Number of employees on consolidated basis by region, and Percentage of those in Europe and North America



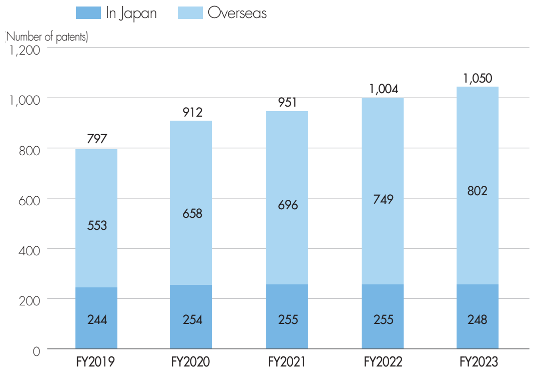
On a consolidated basis, the number of employees increased 25 from the end of the previous fiscal year to 1,349. The figure includes 642, up 21 from the previous fiscal year in Japan; 205, up 8 from the previous fiscal year in North America; 362, down 15 from the previous fiscal year in Europe; and 140, up 11 from the previous fiscal year for employees common to all regions. The combined total of the numbers in North America and Europe decreased by 7 to 567, representing 42.0% of all employees on a consolidated basis.

Number of Directors



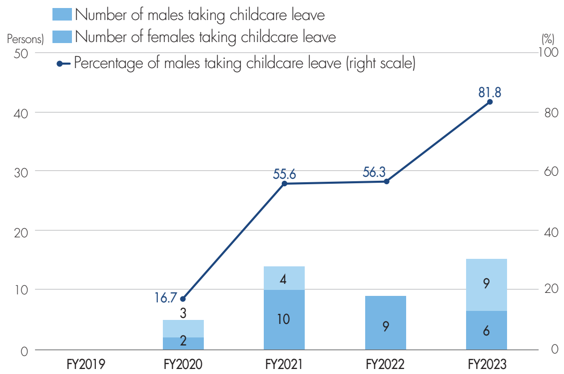
In fiscal 2023, the Company's Directors totaled ten, including five Outside Directors, and the percentage of Outside Directors came to 50%. Female Directors increased by one (Outside), and the percentage of female Directors has risen to 10.0%.

Number of patents held



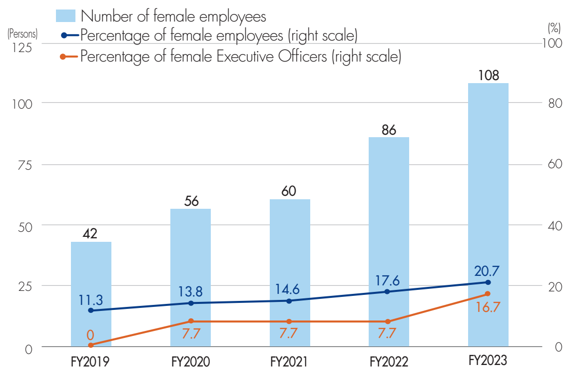
The Company held patents totaling 248 in Japan and 802 overseas totaling 1,050 at the end of fiscal 2023 on a non-consolidated basis. The number of patents held on a consolidated basis is 1,079.

Number of employees taking childcare leave, and Percentage of males taking childcare leave



The number of employees who took childcare leave on a non-consolidated basis was nine (nine males and zero females) in fiscal 2022 and 15 (six males and nine females) in fiscal 2023. Ratio of male employees who took childcare leave came to 81.8% on a non-consolidated basis. The number of employees who took childcare leave and the ratio of males who took childcare leave have been collected since fiscal 2020.

Number and percentage of female employees, and Percentage of female Executive Officers



The number of female employees on a non-consolidated basis increased 22 from the end of the previous fiscal year to 108, representing 20.7% of the non-consolidated total employees of 523. The Company has two female Executive Officers, representing 16.7%, and two females in managerial positions, representing 2.2%. For fiscal 2024, our target figure for female officers and those in managerial positions is to have two female officers and five females in managerial positions.