



Harmonic Drive Systems Inc.

Harmonic Drive Systems Inc.

Financial Results for the Fiscal Year Ended March 31, 2022

May 20, 2022

This presentation contains forward-looking statements relating to expected future performance as of May 20, 2022. Such statements are based on the views and assumptions of company management and involve risks and uncertainties such as changes in the business environment that may cause the actual results to differ materially from expectations.



Performance Summary for FY 2022/3

Consolidated results for FY 2022/3 (versus original forecasts)

(millions of yen)

	Forecast (announced Nov 12, 2021)		FY2022/3 (actual)		Vs. original forecasts	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate (%)
Net sales	56,500	100.0	57,087	100.0	587	1.0
Operating income	8,200	14.5	8,739	15.3	539	6.6
Ordinary income	8,200	14.5	9,108	16.0	908	11.1
Net income	5,500	9.7	6,643	11.6	1,143	20.8
EPS (yen)	57.14	—	69.02	—	11.88	20.8

Net income refers to net income attributable to owners of parent.

Consolidated results for FY 2022/3 (year-on-year change)

(millions of yen)

	FY2021/3		FY2022/3		Year-on-year change	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate (%)
Net sales	37,034	100.0	57,087	100.0	20,053	54.1
Operating income	865	2.3	8,739	15.3	7,873	909.3
Ordinary income	1,366	3.7	9,108	16.0	7,741	566.4
Net income	662	1.8	6,643	11.6	5,981	902.9
EPS (yen)	6.88	—	69.02	—	62.14	902.9
Capital investment	1,959	—	5,690	—	3,730	190.4
Depreciation costs	7,389	—	8,254	—	865	11.7
R&D costs	2,444	—	3,012	—	568	23.3

Net income refers to net income attributable to owners of parent.

Depreciation costs include depreciation cost of tangible assets and amortization cost of intangible assets and goodwill.

Performance of main group companies in FY 2022/3

(millions of yen)

(millions of yen)		Equity stake	Net sales		Net income	
			Amountc	Year-on-year change (%)	Amountc	Year-on-year change (%)
	Harmonic Drive Systems Inc.	—	41,120	69.5	8,358	224.7
*2	HD Systems, Inc. (Harmonic Drive L.L.C.) (U.S.A)	100% (100%)	6,660	29.3	762	136.0
	Harmonic AD, Inc.	100%	2,765	62.0	365	2,463.8
*3	Harmonic Drive Systems (Shanghai) Co., Ltd.	100%	4,039	69.3	265	80.5
*4	Harmonic Drive SE (Germany)	100%	13,293	35.4	1,532	216.3

*1 For overseas subsidiaries, the fiscal year ends December 31.

*2 Exchange rates: FY 20/12 1USD = 106.82 yen, FY 21/12 1USD = 109.80 yen

*3 Exchange rates: FY 20/12 1CNY = 15.48 yen, FY 21/12 1CNY = 17.03 yen

*4 Exchange rates: FY 20/12 1EUR = 121.81 yen, FY 21/12 1EUR = 129.89 yen

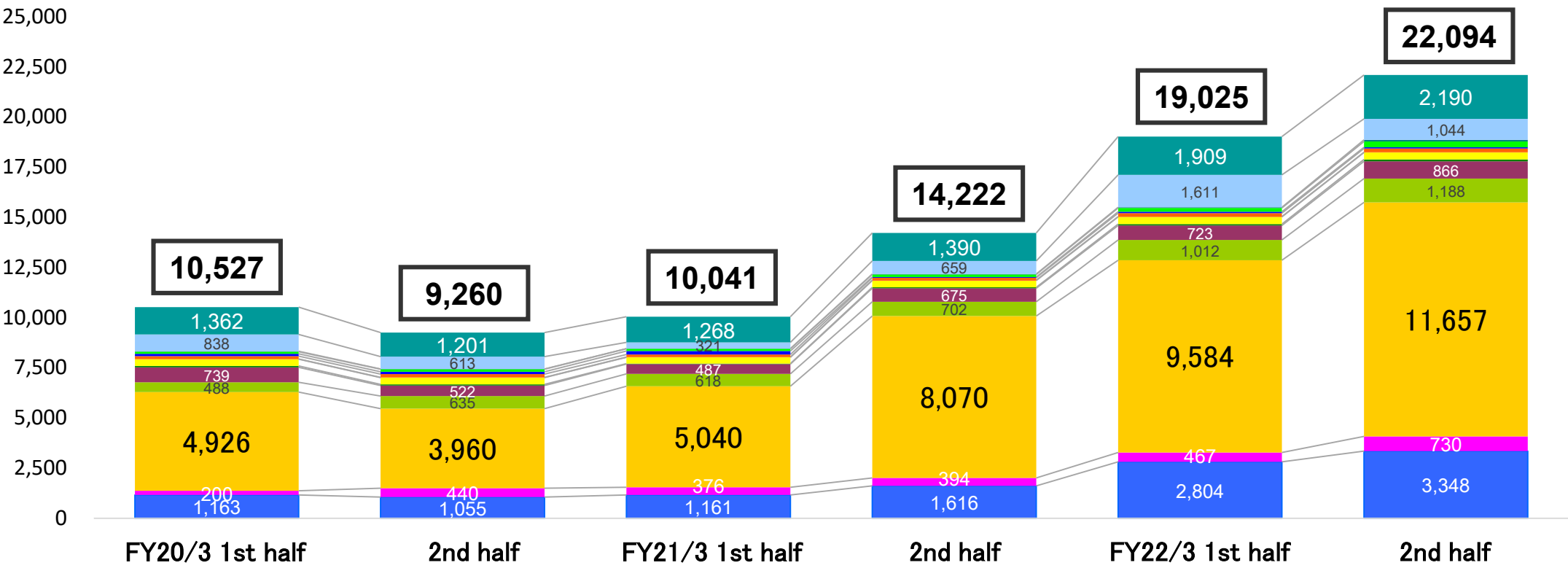
Non-consolidated results for FY 2022/3(year-on-year change)

(millions of yen)

	FY2021/3		FY2022/3		Year-on-year change	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate (%)
Net sales	24,264	100.0	41,120	100.0	16,855	69.5
Operating income	2,573	10.6	8,358	20.3	5,784	224.7
Ordinary income	2,764	11.4	8,702	21.2	5,938	214.8
Net income	1,868	7.7	6,545	15.9	4,677	250.4
EPS (yen)	19.41	—	68.00	—	48.59	250.4
Capital investment	545	—	4,589	—	4,043	741.3
Depreciation costs	2,872	—	3,502	—	630	22.0
R&D costs	1,807	—	2,251	—	443	24.5

Non-consolidated bookings by application (half-yearly)

(millions of yen)



- Semiconductor Equipment

Machine Tools

Measuring Machines

Vehicle
- Flat Panel Display Equipment

Printing Machine

Excavation System for the Oil

Others
- Robotics

Optical Devices

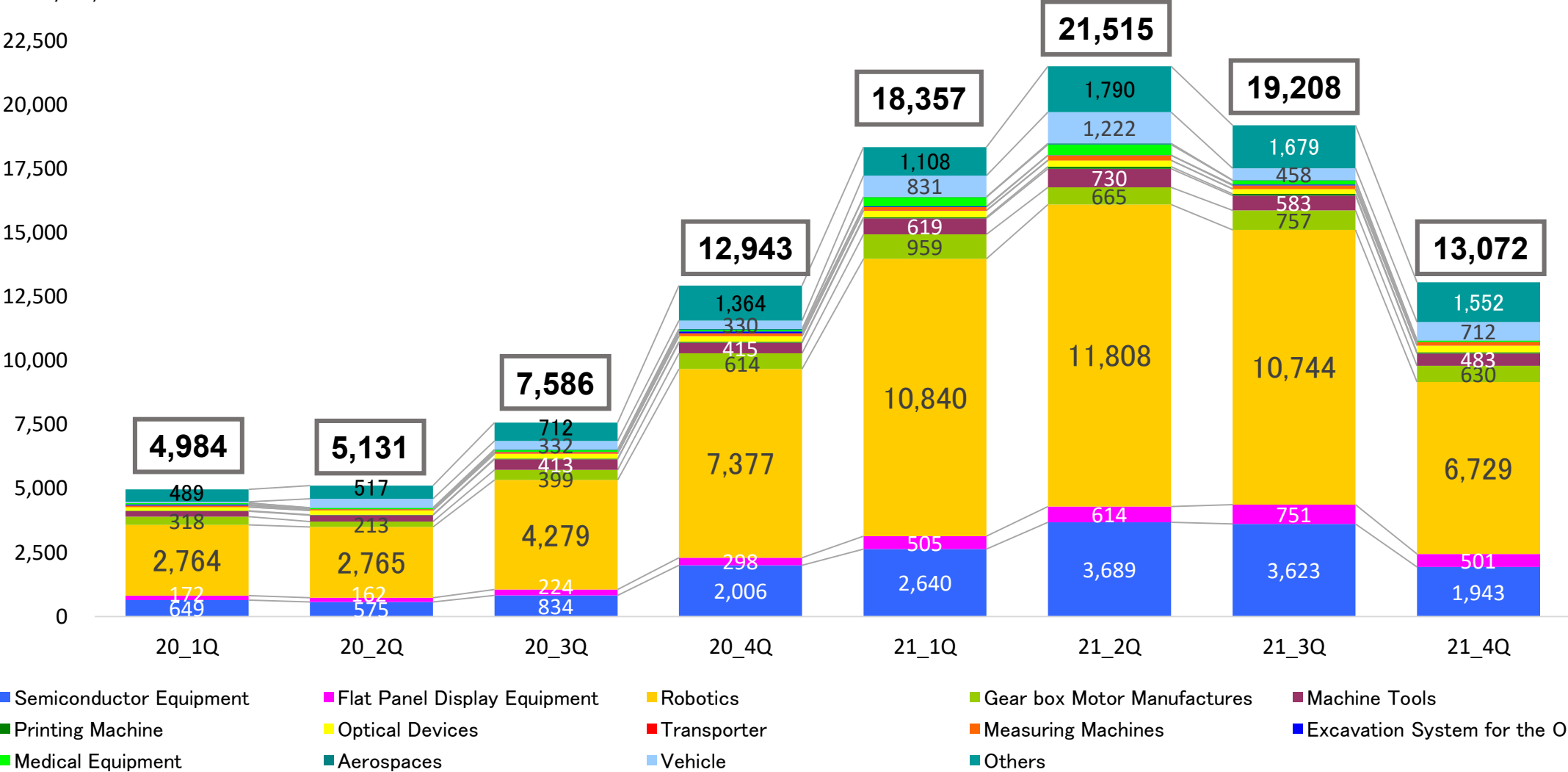
Medical Equipment
- Gear box Motor Manufactures

Transporter

Aerospaces

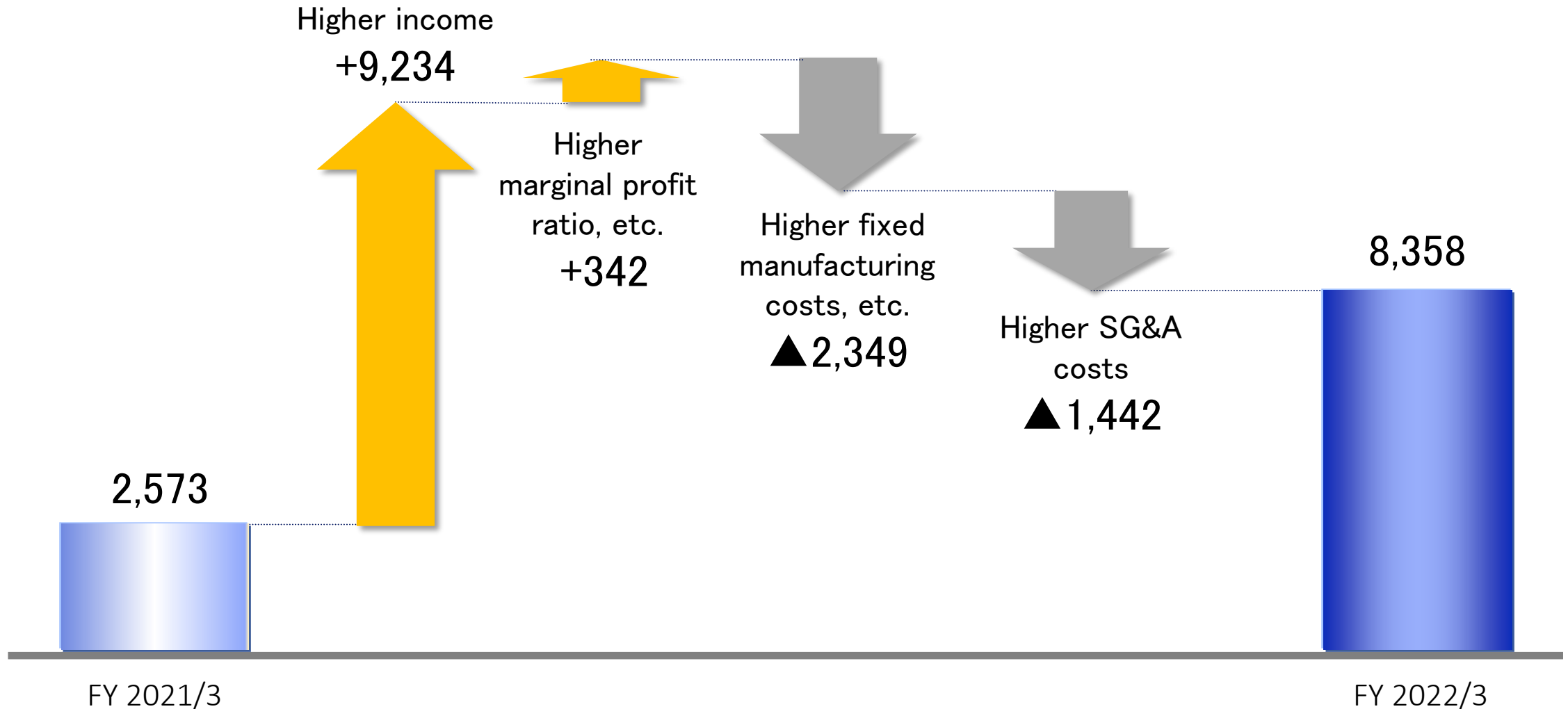
Non-consolidated bookings by application (quarterly)

(millions of yen)

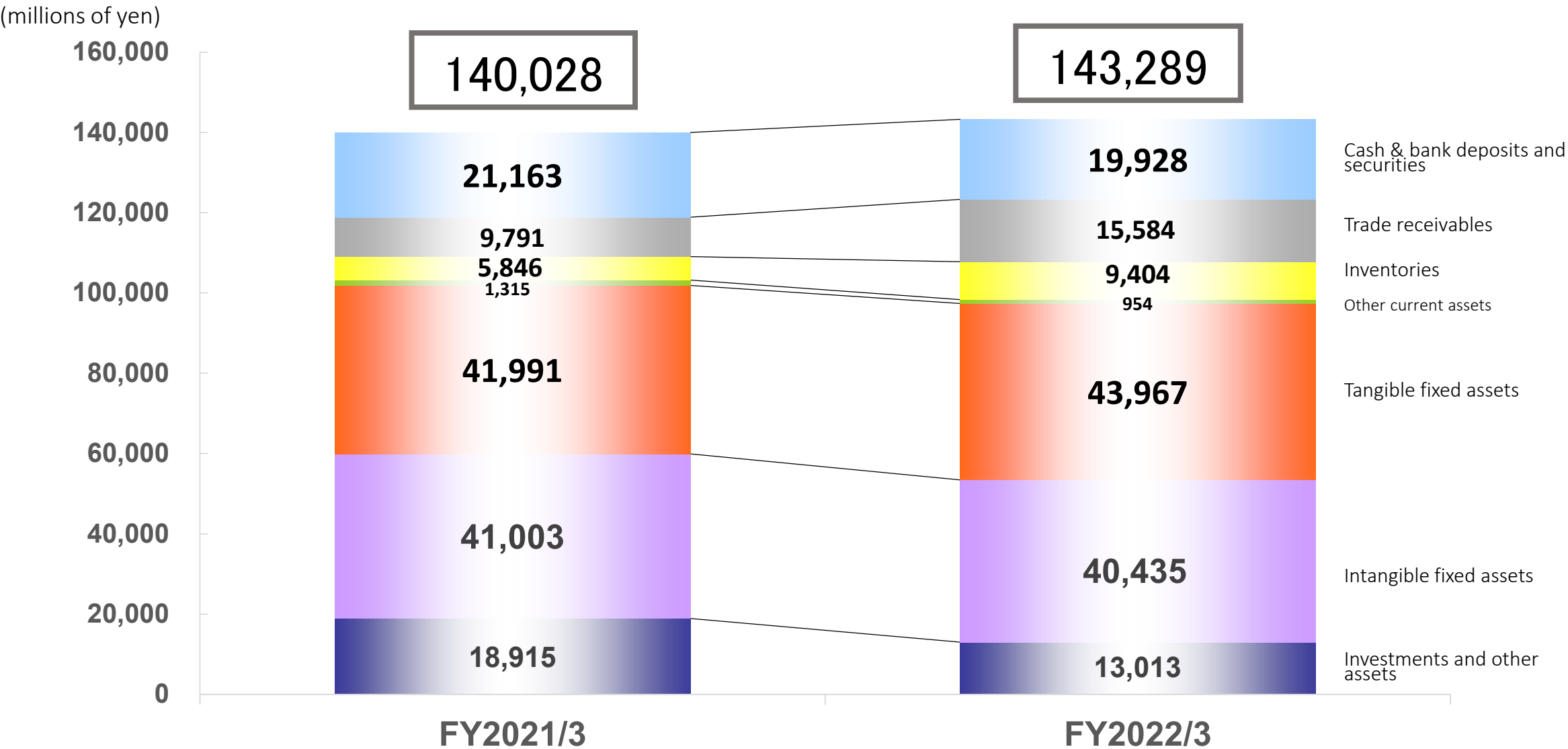


Factors in year-on-year change in non-consolidated operating income (FY 2022/3)

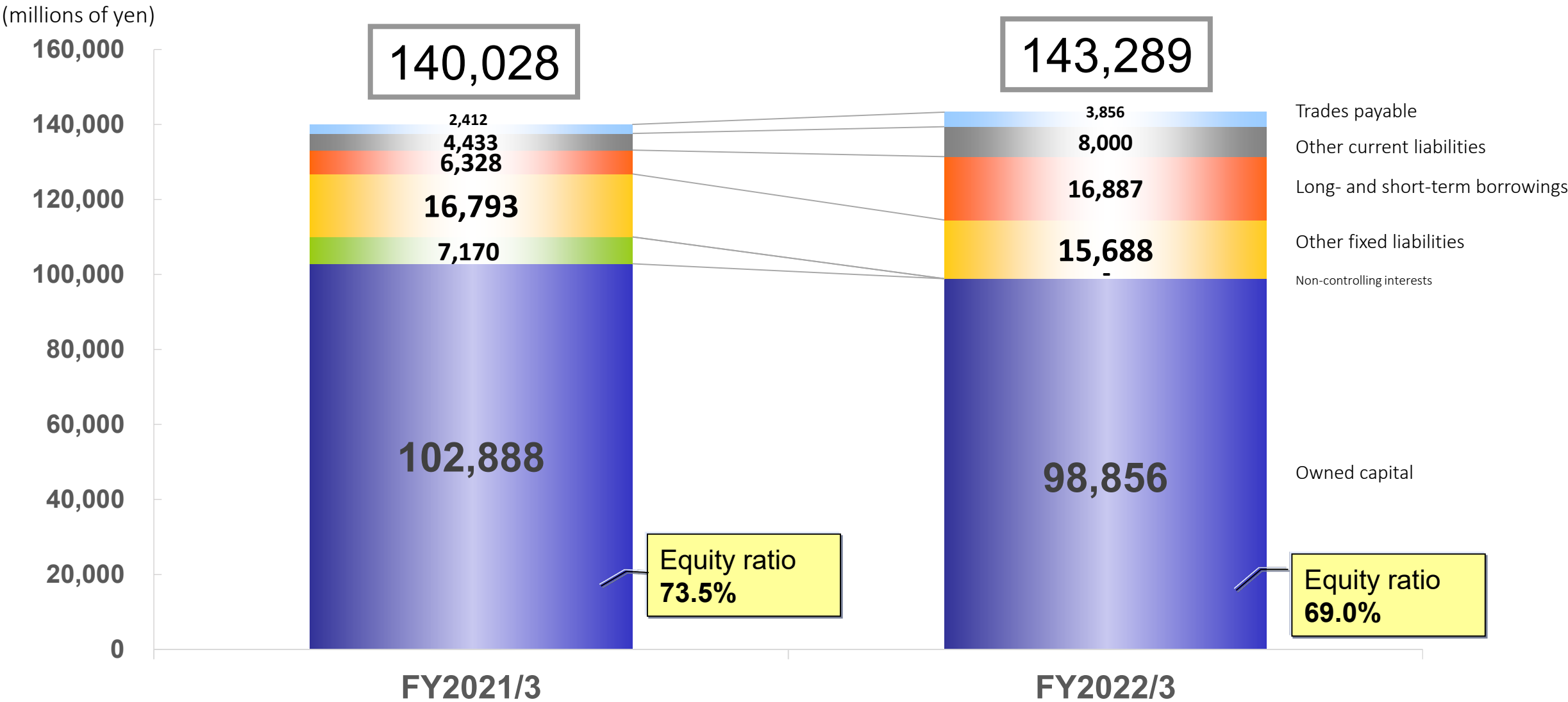
(millions of yen)



Status of consolidated assets



Status of consolidated liabilities and net assets



Status of consolidated cash flows

(millions of yen)

	FY 2021/3	FY 2022/3
Cash flow from operating activities	9,555	9,881
Cash flow from investing activities	▲4,180	▲19,490
Cash flow from financing activities	▲3,611	8,123
Effect of exchange rate changes on cash and cash equivalents	▲108	256
Net increase (decrease) in cash and cash equivalents	1,654	▲1,229
Cash and cash equivalents at end of year	19,996	18,767

Performance Forecasts for FY 2023/3

Consolidated performance forecast for fiscal year ending March 31, 2023

(millions of yen)

	FY2022/3		FY2023/3 forecasts		Year-on-year change	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate (%)
Net sales	57,087	100.0	75,000	100.0	17,912	31.4
Operating income	8,739	15.3	13,000	17.3	4,260	48.7
Ordinary income	9,108	16.0	13,000	17.3	3,891	42.7
Net income	6,643	11.6	9,000	12.0	2,356	35.5
EPS (yen)	69.02	—	93.49	—	24.48	35.5
Capital investment	5,690	—	14,500	—	8,809	154.8
Depreciation costs	8,254	—	9,500	—	1,245	15.1
R&D costs	3,012	—	3,800	—	787	26.1

※ Assumed exchange rate for FY23/3 forecasts 1USD = ¥123.00 1EUR = ¥133.00 1CNY = ¥19.00

※Net income refers to net income attributable to owners of parent.

※Depreciation costs include depreciation cost of tangible assets and amortization cost of intangible assets and goodwill.

Forecasts of main group companies for fiscal year ending March 31, 2023

(millions of yen)

	Equity stake	Net sales		Operating income	
		Amount	Year-on-year change (%)	Amount	Year-on-year change (%)
	—	55,000	33.8	11,000	31.6
*2	100% (100%)	10,000	50.1	1,200	57.4
	100%	3,000	8.5	400	9.4
*3	100%	5,000	23.8	200	▲24.7
*4	100%	15,000	12.8	2,500	63.2

*1 For overseas subsidiaries and affiliates, the fiscal year ends December 31.

*2 Exchange rates: Jan. – Dec., 2021 1USD = 109.80 yen, Jan. – Dec., 2022 forecast 1USD = 123.00 yen

*3 Exchange rates: Jan. – Dec., 2021 1CNY = 17.03 yen, Jan. – Dec., 2022 forecast 1CNY = 19.00 yen

*4 Exchange rates: Jan. – Dec., 2021 1EUR = 129.89 yen, Jan. – Dec., 2022 forecast 1EUR = 133.00 yen

Non-Consolidated performance forecast for fiscal year ending March 31, 2023

(millions of yen)

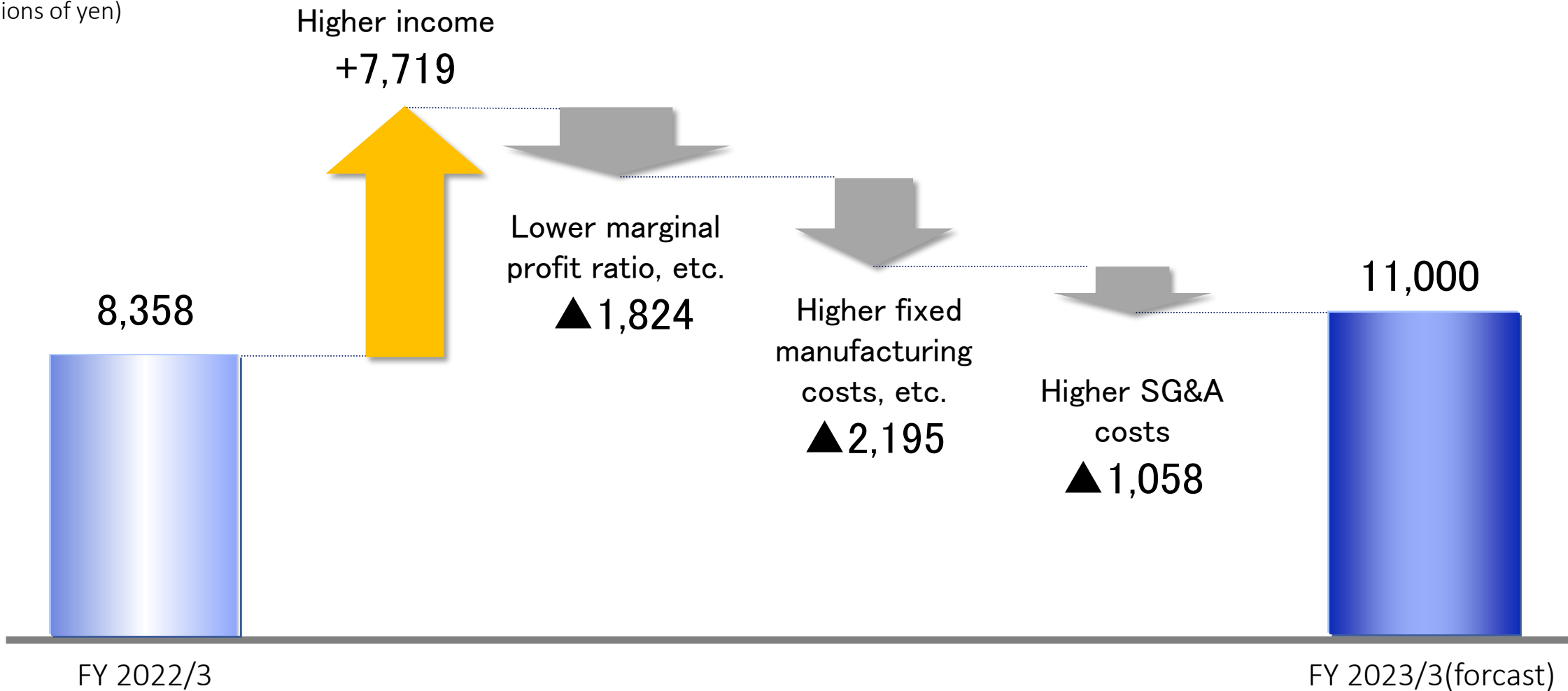
	FY2022/3		FY2023/3 forecasts		Year-on-year change	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate (%)
Net sales	41,120	100.0	55,000	100.0	13,879	33.8
Operating income	8,358	20.3	11,000	20.0	2,641	31.6
Ordinary income	8,702	21.2	11,200	20.4	2,497	28.7
Net income	6,545	15.9	7,500	13.6	954	14.6
EPS (yen)	68.00	—	77.91	—	9.91	14.6
Capital investment	4,589	—	11,500	—	6,910	150.6
Depreciation costs	3,502	—	4,500	—	997	28.2
R&D costs	2,251	—	2,500	—	248	11.1

※ Assumed exchange rate for FY23/3 forecasts 1USD = ¥123.00 1EUR = ¥133.00 1CNY = ¥19.00

※ Depreciation costs include depreciation cost of tangible assets and amortization cost of intangible assets and goodwill.

Factors in year-on-year change in non-consolidated operating income (fiscal year ending March 31, 2023 forecast)

(millions of yen)



Future Outlook

1. Our operating environment

1-1. Demand for HDSI's products

Outlook

- Robust investments in automation and enhancements
- Customers' production and scale continue to expand

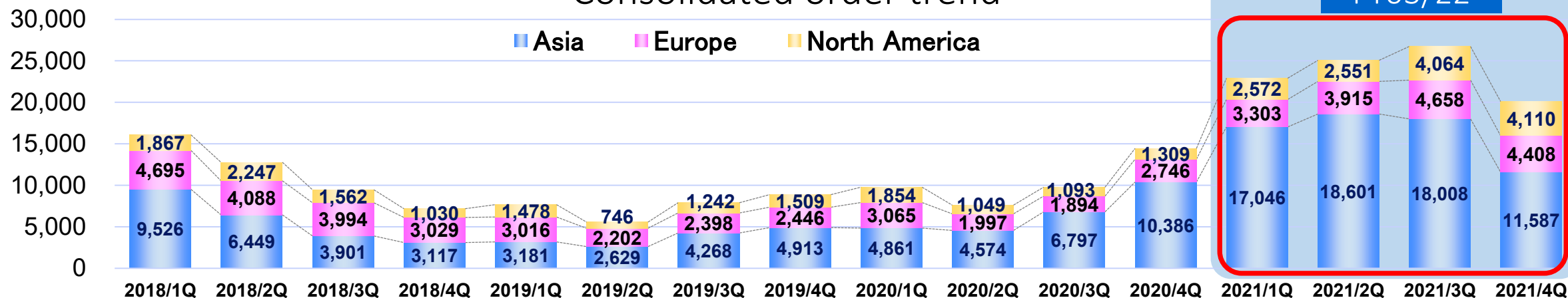
Concerns

- Shortages in components, rapid increase in raw material prices
- ➡ Delays and slowdown in capital investments

(millions of yen)

Consolidated order trend

■ Asia ■ Europe ■ North America



Asia

Capital investments in EV and semiconductors are growing, while overheated capital investment demand in China subsides

Europe

Orders recovered in line with normalization of market conditions, especially for industrial robots

North America

Orders were strong for semiconductor and medical applications, and recovery in amusement applications



Harmonic Drive Systems Inc.

2.Trends in Main Fields of Application

2-1. Factory automation robot market forecast

Labor shortage

Labor management
measures



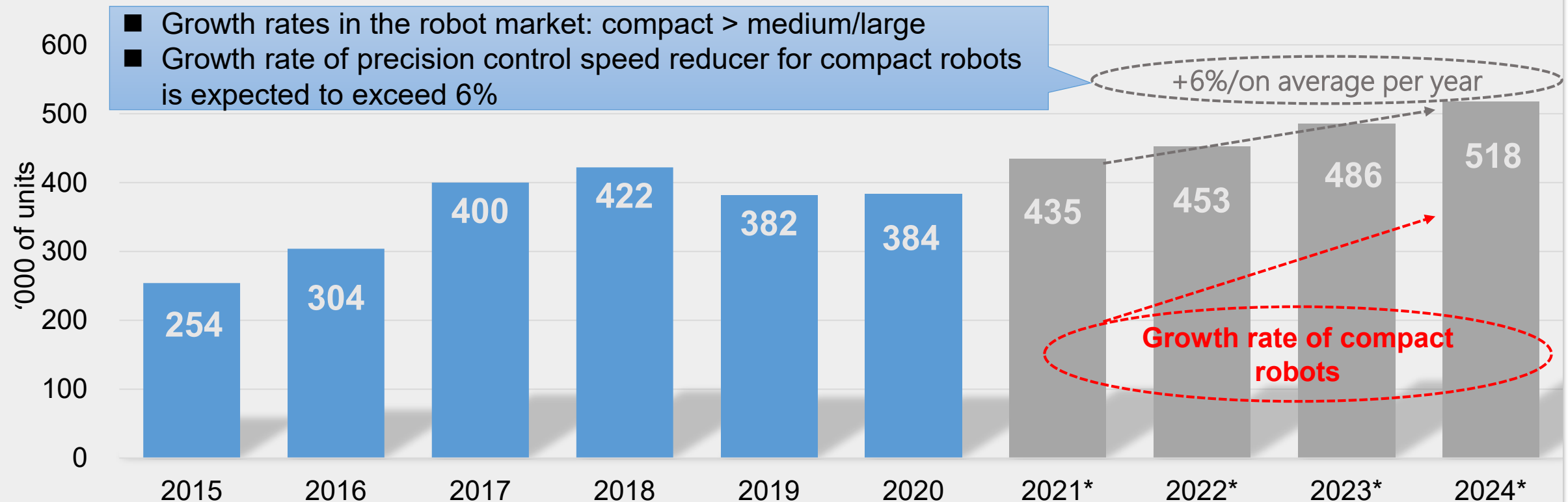
Infection
prevention

Automation demand

Labor-saving demand

Market
expansion

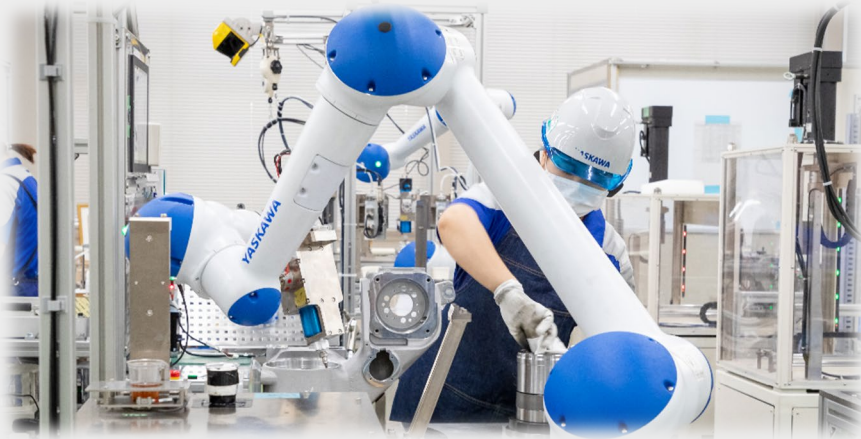
Annual installations of industrial robots 2015 –2020 and 2021* – 2024*



Source: compiled by the Company based on IFR World Robotics 2021

2-2. Collaborative robot market forecast

- Demand is accelerating for co-bots as a solution for non-contact demand and labor management
- Growth in applications as key robot manufacturers make a full-scale entry into the field ➡ Market expansion is accelerating

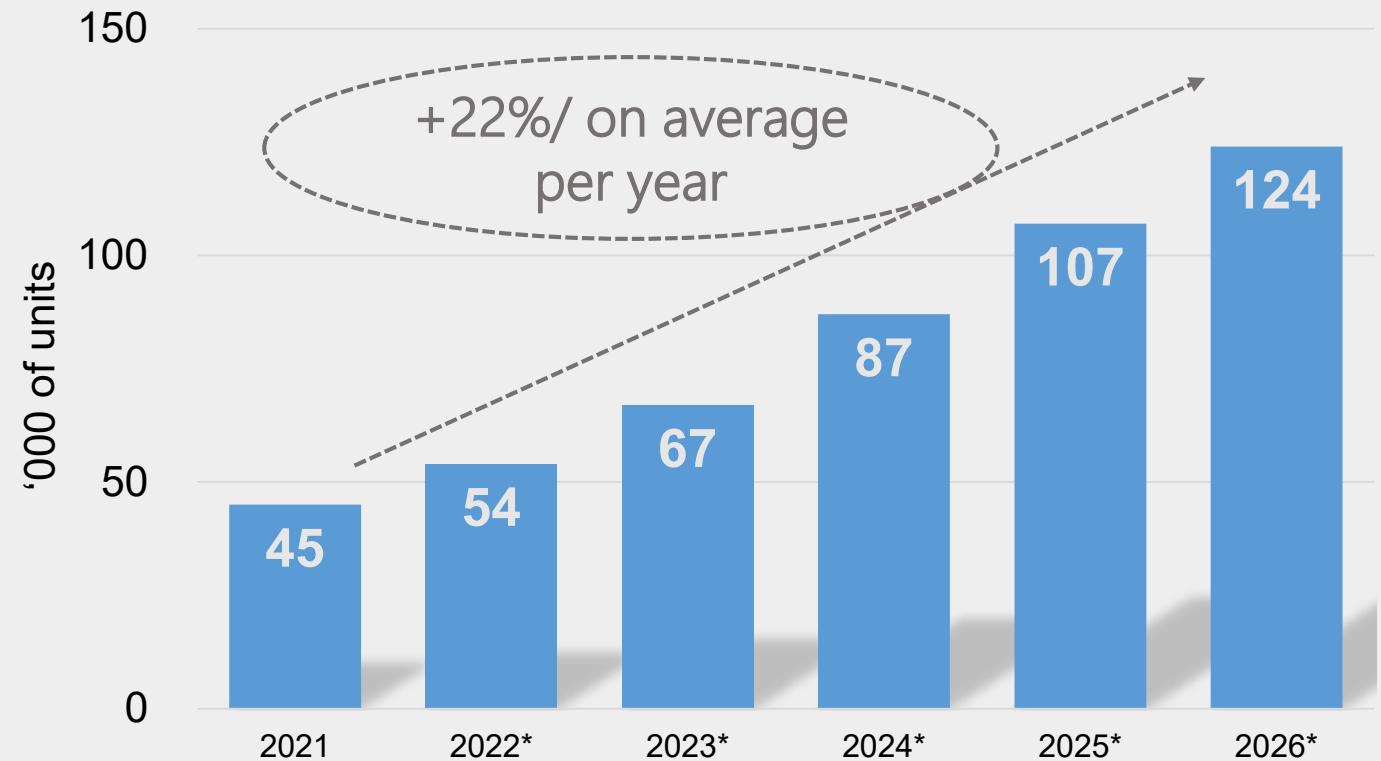


Courtesy of YASKAWA Electric Corporation



Could humanoid co-bots be on the horizon?

Collaborative robot global market size(forecast)



Note: Figures for 2021 are estimates, figures for 2022 and beyond are forecasts, based on the number of units shipped by manufacturers
Source: Compiled by the Company based on "Survey on the Global Market for Collaborative Robots (2021)" published by Yano Research Institute Ltd. on March 28, 2022

2-3. Semiconductor manufacturing equipment and Vehicle

Semiconductor manufacturing equipment

- Global shortage of semiconductors driven by the surge in data demand
- ➡ Large-scale investment by major semiconductor companies to continue beyond 2023
- ➡ Governments to support the semiconductor industries of their respective countries
- Foundries set to accelerate investment in cutting edge technologies
- Domestic semiconductor production will accelerate in China.
- ➡ Production capacity expansion will lead to higher sales of semiconductor manufacturing equipment.



Vehicle: Used in variable compression ratio (VCR) engines

- Achieved improvements in ease of installation, fuel economy, and quietness at high speeds
- This will become the center of Nissan's next-generation engines
- Also used for e-POWER in exclusive power generator engines
- Production down due to semiconductor shortage
- ➡ No change in total demand



Courtesy of
Nissan Motor Co. Ltd.

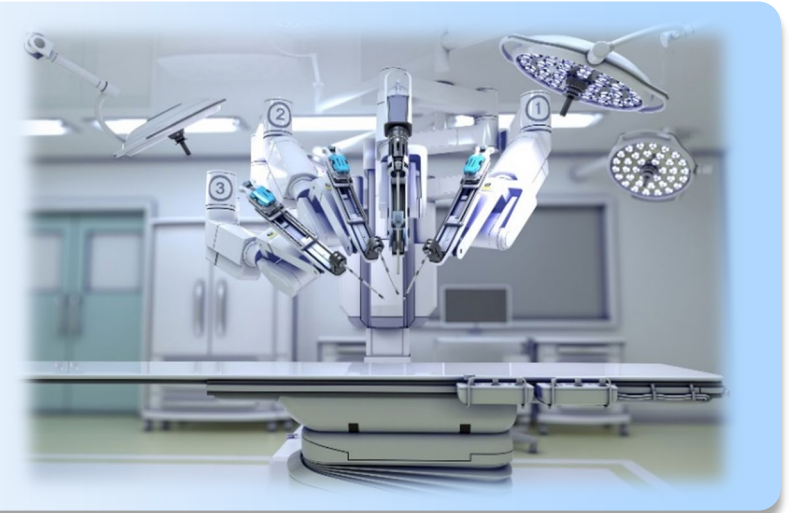
3. New Applications

3-1. Medical care and health care

Surgical robots

- Diverse manufacturers in Japan, the US, and Europe use our products
- Providing total motion control with highly integrated Harmonic Drive®, planetary gear speed reducers, and mechatronics products
- Treatment fields expanding \downarrow More companies joining the field

Full-scale adoption



Examples of healthcare applications



Medical equipment ▪ Specimen analysis/test equipment/PCR test applications



Assisted suits ▪ Moving into a phase of practical adoption with expanded insurance coverage and subsidies



Electric wheelchairs ▪ Autonomous driving enhances convenience

3-2. Amusement

Animatronics

- Harmonic Drive® helps to realistically replicate the movements of people, animals, and fictional creatures
- Major amusement companies are restarting investments with a view toward society “With COVID” and “Post-COVID”
- Animatronics products for attractions and shows are actively developed and invested



Source: Harmonic Drive SE website

3-3. Aviation and Space

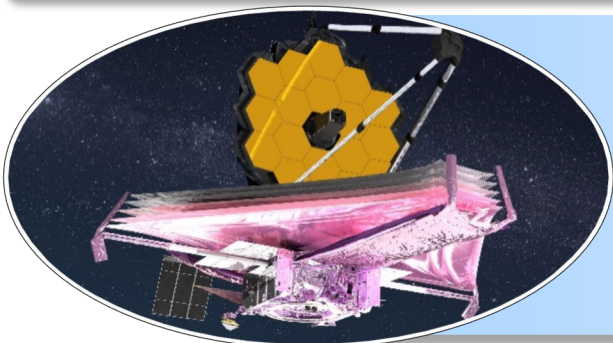
eVTOL (flying car)

- Electrification of aircraft ➡ CO2 emission reduction, quieter operations
- Our compact and lightweight products are suited to these needs
- Top players in eVTOL have entered the commercialization stage
- What about large aircraft?



Space industries

- Commercial opportunities expand as private companies enter the space field
- Harmonic Drive®, which has a proven track record in space applications, will expand its areas of business
- HDSI's activities were introduced on BS TV Tokyo's "Japan Takes on the Challenge! New Space Business" (December 2021)



James Webb Space Telescope

- Successor to the Hubble Space Telescope (scheduled for launch this December)
- One NIRCam (infrared camera) unit and two antenna units use Harmonic Drive®

Credit: NASA GSFC/CIL/Adriana Manrique Gutierrez

3-4. Barrier-free

Step/gap eliminators between train platforms and cars

(West Japan Railway Company / Komatsu Seisakusho Co., LTD. (Matsumoto City))

- Several HDSI planetary gear reducers are being used in each unit
 - Adopted in prototypes based on recognition of outstanding safety, performance, and unique suitability in outdoor applications
 - Enables wheelchair users to board and disembark trains without assistance
- ➡ Contributes to a barrier-free society

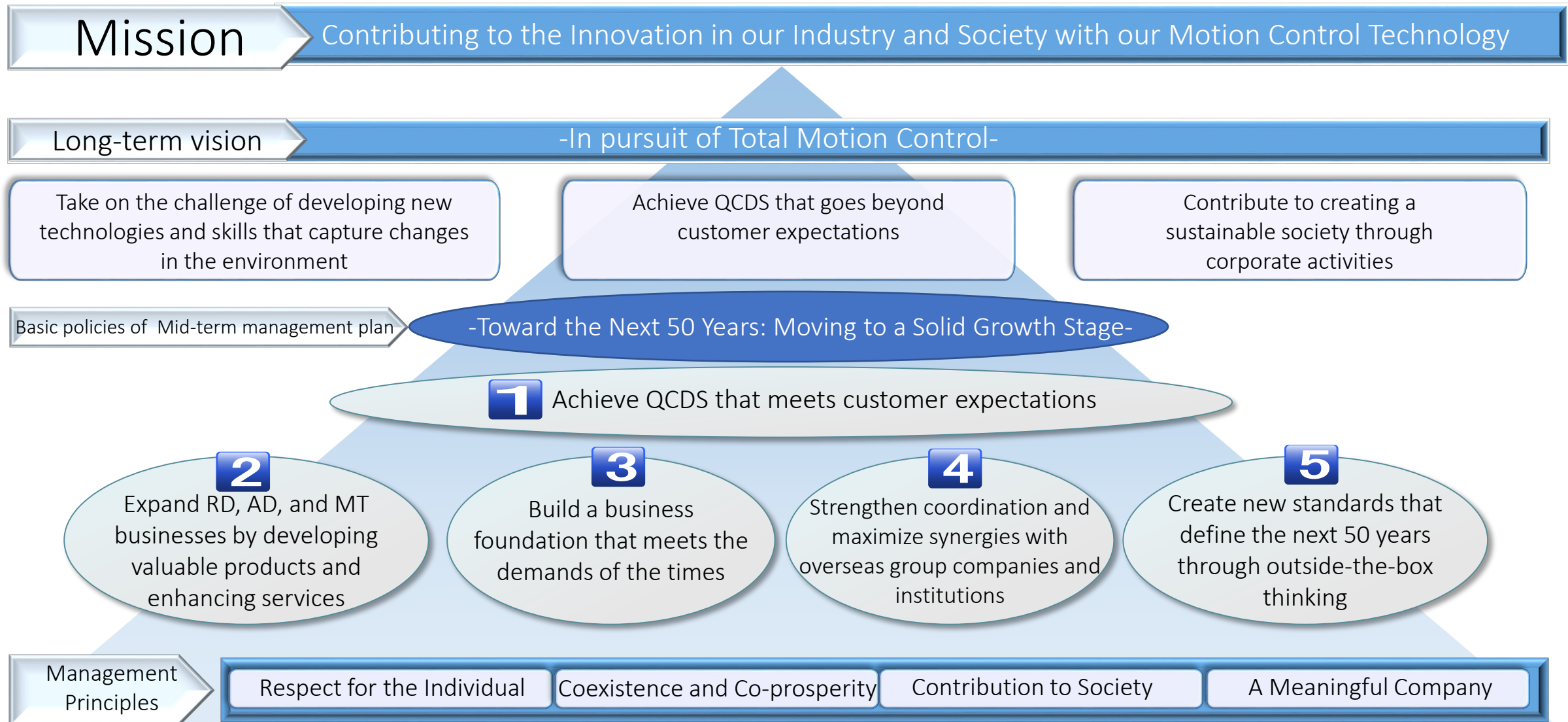


Source: Komatsu Seisakusho Co., LTD.

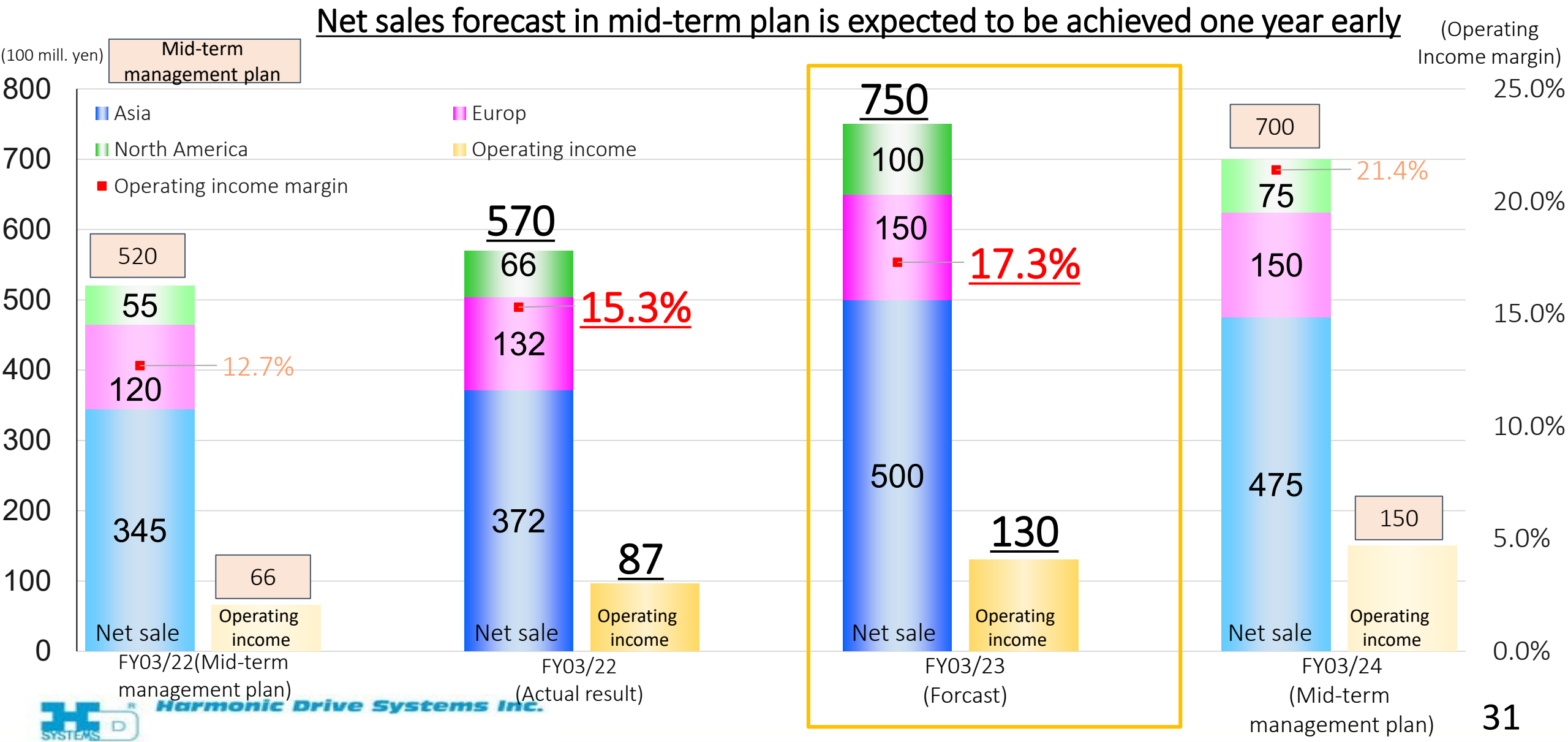
4. Progress of Mid-term Management Plan

(FY2021 ~ FY2023)

4-1. Mission, Long-term vision and Basic policies of Mid-term management plan



4-2. Consolidated sales and Operating income of Mid-term management plan (FY03/22 - FY03/24)



4-3. Increasing Production Capacity ①The Ariake Plant

Basic Policies 1 Achieve QCDS that meets customer expectations

- Established a production system with capacity of total 200,000 units/month at the Hotaka Plant and the Ariake Plant, as laid out in the previous mid-term plan (2018–2020)
- Construction of a highly automated production line
- Delivery and installation from March to August 2022
- Digitize various data and promote introduction of IoT
- Delivery and installation scheduled from March to August 2022



Increased production capacity

Additional 70,000 units
(Industrial: 40,000 units;
Automotive: 30,000 units)

Improve **stable supply capacity**

Increased productivity

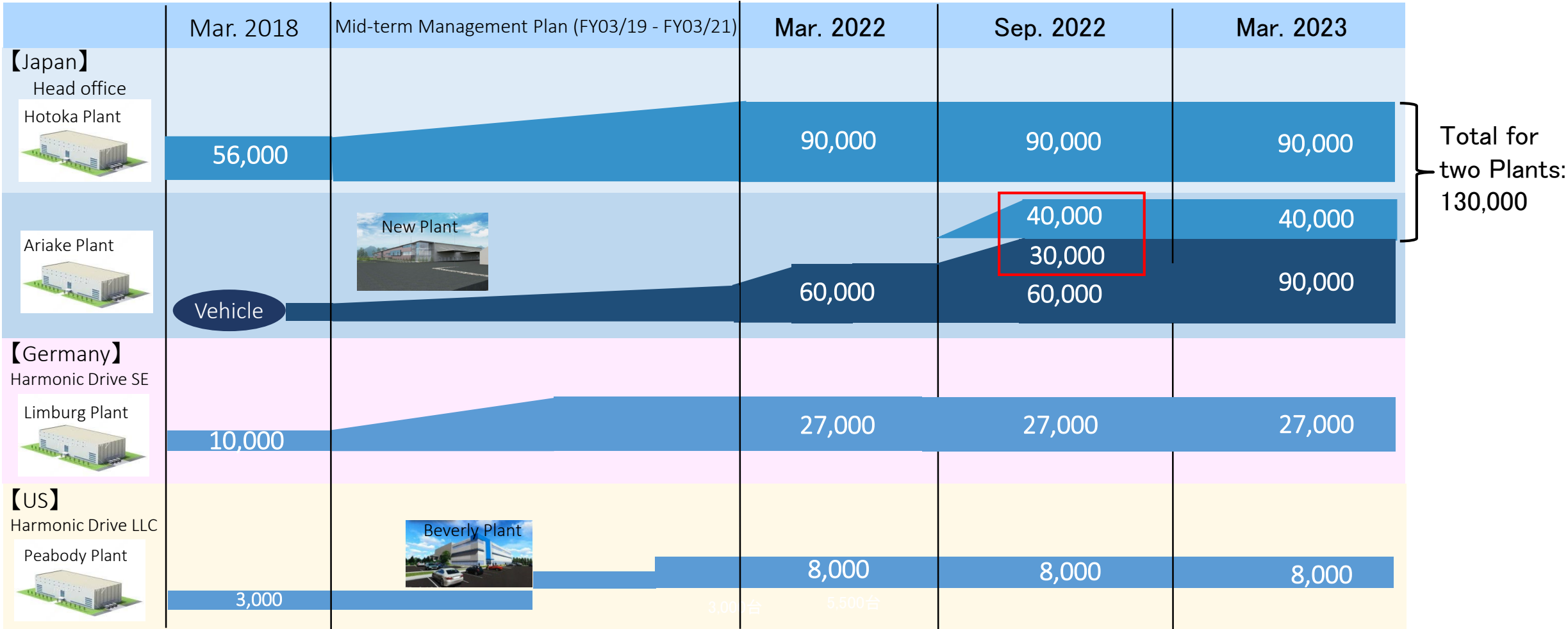
Improve automation
and save labor

Increase **cost performance**


4-3. Increasing Production Capacity ②Production capacity of Group companies

Basic Policies 1 Achieve QCDS that meets customer expectations

Basic Policies 4 Strengthen coordination and maximize synergies with overseas group companies and institutions



Total for two Plants: 130,000

 Harmonic Drive Systems Inc.

Total: 79,000

Total(excl. automotive): 125,000
Total : 185,000

➡

165,000 32.0%UP

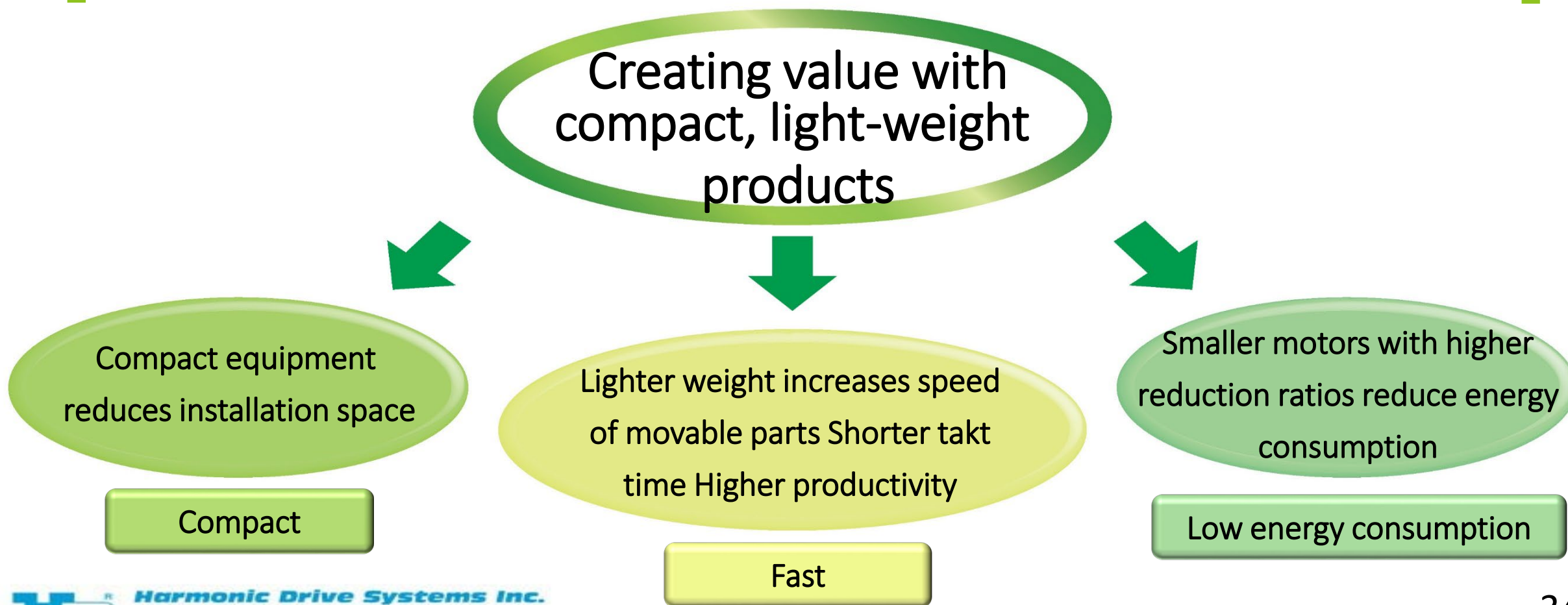
255,000 37.8%UP

4-4. Contributing to energy conservation

Basic
Policies

2 Expand RD, AD, and MT businesses by developing valuable products and enhancing services

Contributing to energy conservation by further reducing size and weight



4-4. Contributing to energy conservation ①Development of MINI-MICRO products

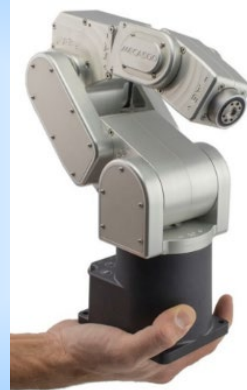
Basic
Policies

2 Expand RD, AD, and MT businesses by developing valuable products and enhancing services

Advanced medicine, amusement



Palm sized robots



www.mecademic.com

Courtesy of Mecademic Inc.

Small collaborative robots, semiconductor manufacturing equipment



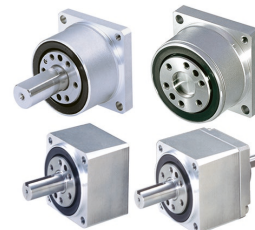
Courtesy of Techman Robot Inc.



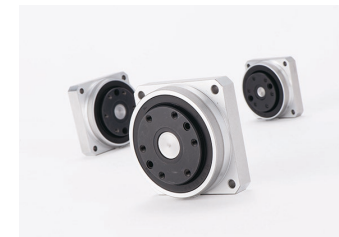
Industry's smallest
Φ5mm



CSF micro series
Starting from Φ10mm



CSF mini series
Starting from □ 20mm



CSF-2UP series
Starting from □ 50mm

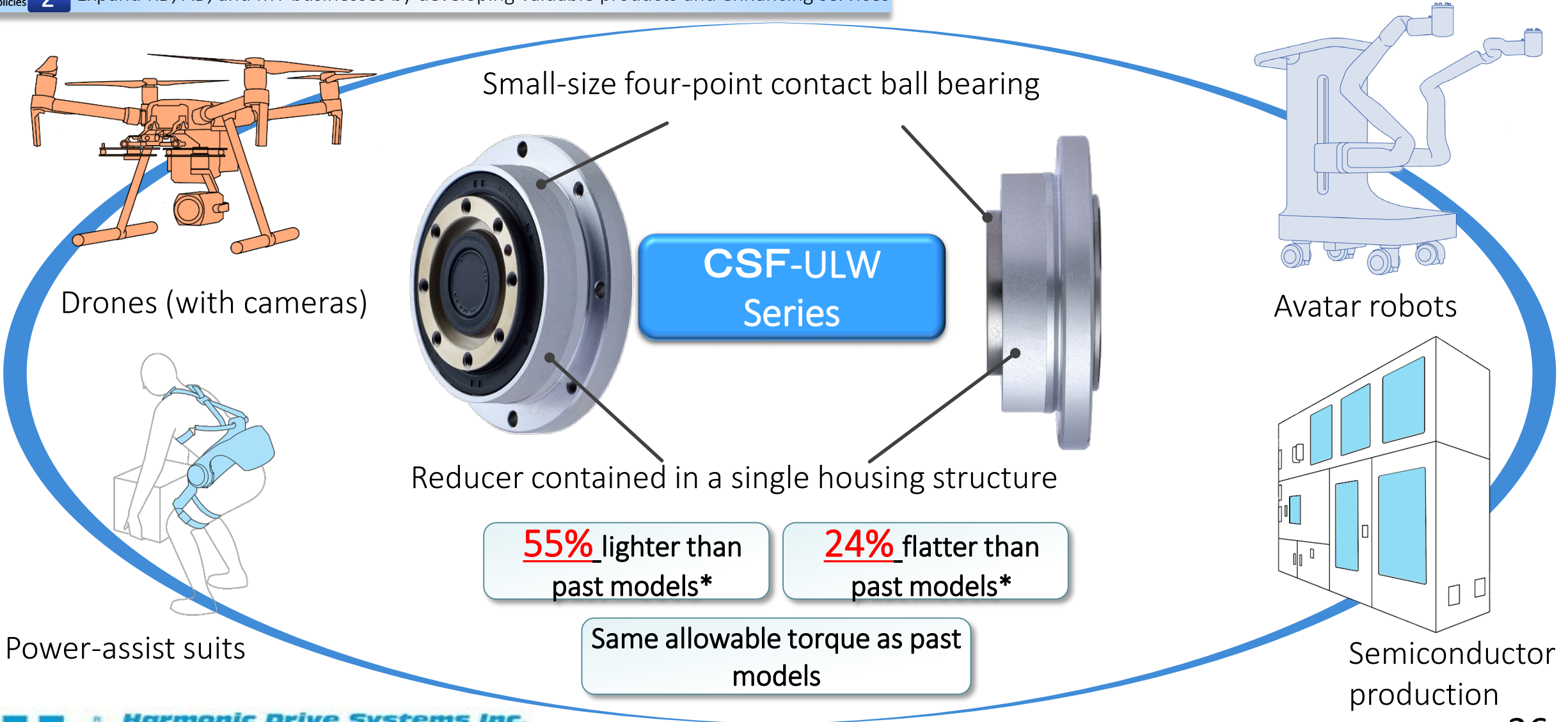


CSF-ULW series
Starting from Φ54mm

- Highly-competitive and unmatched products made possible through our Group's unique strengths
- Secure a position as the industry standard in a rapidly growing market

4-4. Contributing to energy conservation ②Pursuit of light weight and flatness

Basic Policies 2 Expand RD, AD, and MT businesses by developing valuable products and enhancing services



4-4. Contributing to energy conservation ③Introducing MINI-MICRO Micromotion GmbH

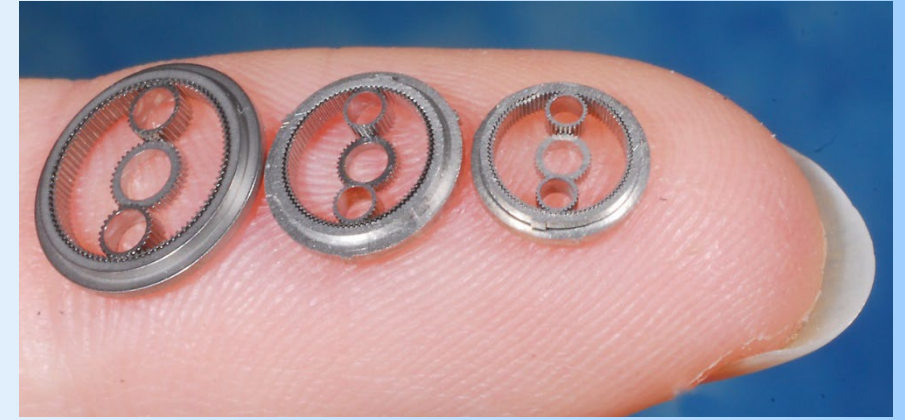
Basic
Policies

2 Expand RD, AD, and MT businesses by developing valuable products and enhancing services

■ Micromotion GmbH

- Sub-subsidiary of HDSI
- Development, manufacture, and sales of ultra-compact gearboxes and actuators using the LIGA process*

*A micro-processing technology using chemical treatment
(German acronym for lithography, electroplating, and molding)



Typical
Applications

Space

Optical
instrument

Semiconductor

Medicine

Testing
equipment

■ About Products

- Ultra-compact wave gears
- Ultra-compact planetary gear speed reducer
- Outer diameter: 6mm or more
- Reduction ratio: 1/40 to 1/1000
- Zero backlash

4-5. Next 50 years

Basic Policies **5** Create new standards that define the next 50 years through outside-the-box thinking

R&D

Joint research with SRI and others
(new principles and peripheral technologies)

Joint research with Japanese and overseas venture companies (new materials and technologies)

Production

Acquire technologies from other industries

Implement low-cost operation and horizontal rollout

Sales

Seek out partnerships that lead to meaningful collaborations

Work with overseas partners to cultivate Asian markets

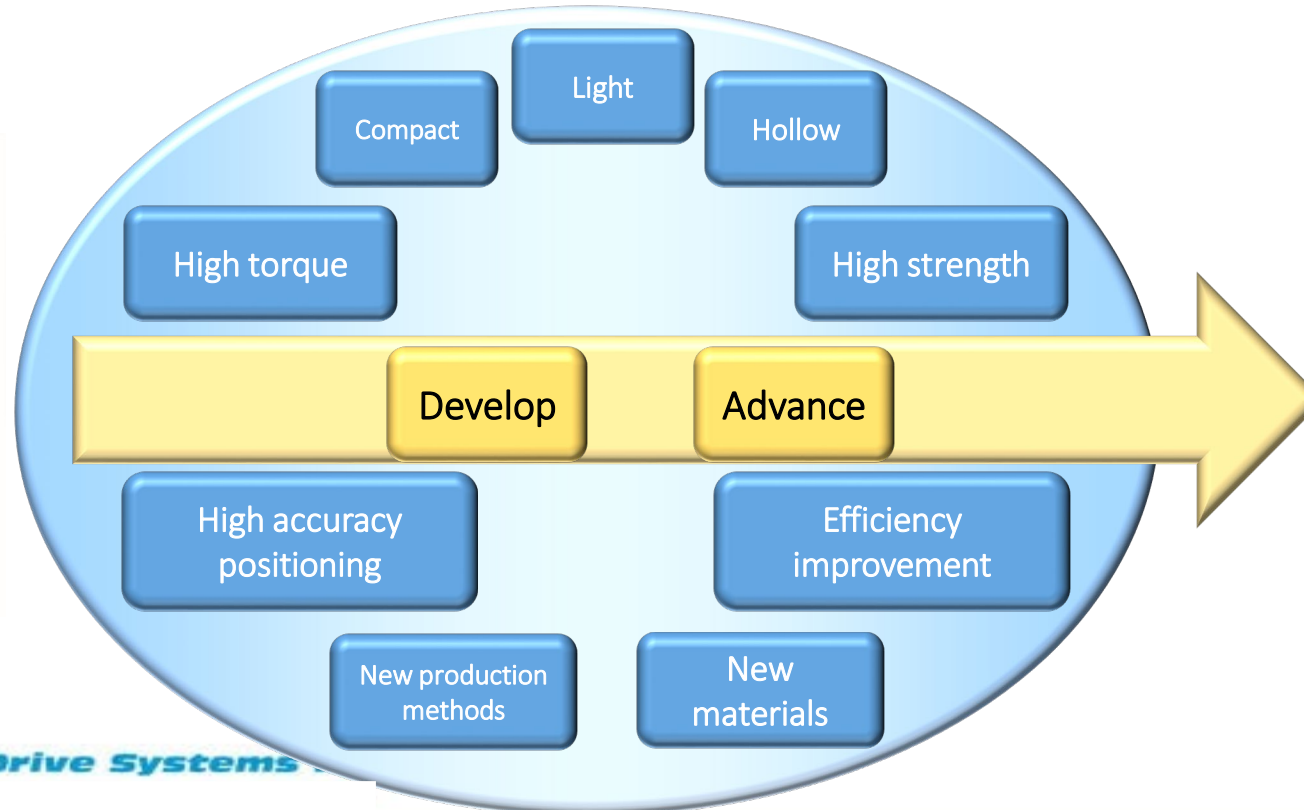
4-6. Our sustainability initiatives

We will continue to develop and advance **Strain Wave Gearing**, which is a unique and awesome invention

Basic Policy of Sustainability (approved on March 25, 2022.)

As a technology and skills-based organization in pursuit of Total Motion Control, the HDS Group aims to enhance corporate value and realize a sustainable society by contributing to technological innovation for the betterment of society. We intend to achieve these goals based on our management philosophy comprising four pillars: **Respect for individuals**, **be a meaningful company**, **coexistence and co-prosperity**, and **contribution to society**.

Our mission

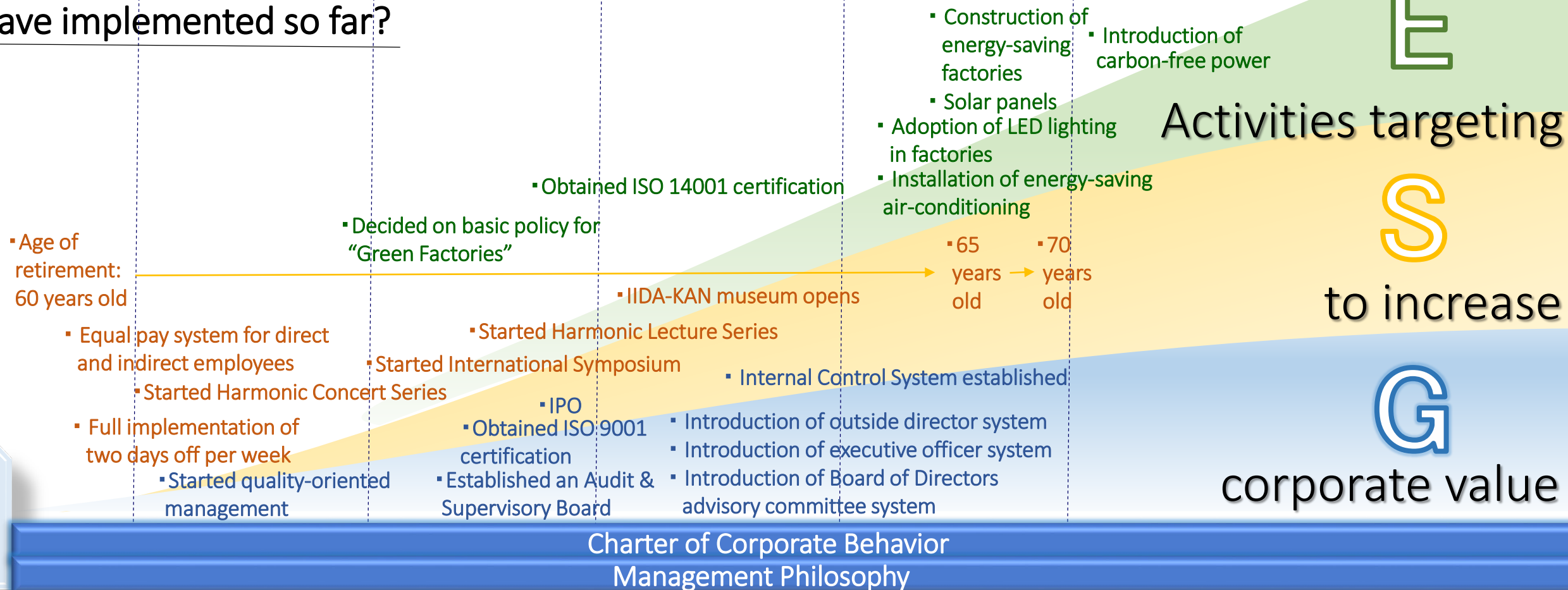


Contribute
to the
Innovation
and
Ecology
of industrial
society

4-7. Our path to sustainability

1970 1980 1990 2000 2010 2020 2050

What should we do based on the ESG activities we have implemented so far?



4-8. Activities borne from strong employee awareness

Basic Policies **3** Build a business foundation that meets the demands of the times

Each division undertakes “grass-roots” activities with an awareness of ESG × SDGs

FY2021: Outcomes in ESG × SDGs

Gen. Affairs

Ariake Plant: Complete transition to CO2-free electricity generated by using water from Azumino City (from April 1, 2022)

安曇野の水でつくった
CO2フリー電気を使っています

Sales

Formed a partnership with DOYA INC., which supports employment and education in Africa. We wore the company's shirts at trade shows.



Accounting

Capital investments in Ariake Factory certified under METI's tax incentive system for investments in carbon neutrality.





Harmonic Drive Systems Inc.

株式会社 ハーモニック・ドライブ・システムズ

