

# ***Harmonic Drive Systems Inc.***

## Presentation on Business Results for the Fiscal Year Ended March 31, 2018

May 18, 2018

This presentation contains forward-looking statements relating to expected future performance as of May 18, 2018. 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.

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# Performance Summary for FY 2018/3

# Consolidated results for FY 2018/3 (versus original forecasts)

(millions of yen)

	Forecast (announced Nov 9, 2017)		FY2018/3 (actual)		Vs. original forecasts	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate (%)
Net sales	53,000	100.0	54,339	100.0	1,339	2.5
Operating income	13,000	24.5	12,598	23.2	▲401	▲3.1
Ordinary income	12,800	24.2	12,228	22.5	▲571	▲4.5
Net income	7,800	14.7	8,059	14.8	259	3.3
EPS (yen)	85.16	—	86.9	—	1.74	2.0

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

# Consolidated results for FY 2018/3 (year-on-year change)

(millions of yen)

	FY2017/3		FY2018/3		Year-on-year change	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate (%)
Net sales	30,069	100.0	54,339	100.0	24,270	80.7
Operating income	7,813	26.0	12,598	23.2	4,784	61.2
Ordinary income	7,958	26.5	12,228	22.5	4,269	53.6
Net income	19,732	65.6	8,059	14.8	▲ 11,672	▲ 59.2
EPS (yen)	215.42	—	86.90	—	▲ 128.52	▲ 59.7
Capital investment	4,576	—	8,757	—	4,180	91.3
Depreciation costs	1,774	—	5,852	—	4,077	229.8
R&D costs	1,383	—	2,114	—	731	52.9

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 FY2018/3

(millions of yen)

		Equity stake	Net sales		Net income	
			Amount	Year-on-year change (%)	Amount	Year-on-year change (%)
	Harmonic Drive Systems Inc.	—	38,982	45.7	7,788	49.6
*2	HD Systems, Inc. (Harmonic Drive L.L.C.) (U.S.A)	100% (51%)	5,509	20.4	241	▲0.4
*5	Harmonic AD, Inc.	100%	2,781	17.0	245	72.8
*3	Harmonic Drive Systems (Shanghai) Co., Ltd.	100%	4,644	105.7	281	—
*4	Harmonic Drive AG (Germany)	74.7%	13,623	19.3	2,044	84.4
*6						

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

\*2 Exchange rates: FY16/12 1USD = 108.84yen, FY17/12 1USD = 112.19yen

\*3 Exchange rates: FY16/12 1CNY = 16.37yen, FY17/12 1CNY = 16.63yen

\*4 Exchange rates: FY16/12 1EUR = 120.33yen, FY17/12 1EUR = 126.67yen

\*5 Net income of US subsidiaries (consolidated) is after excluding non-controlling interests.

\*6. Net income of German subsidiaries (consolidated) is before excluding non-controlling interests .

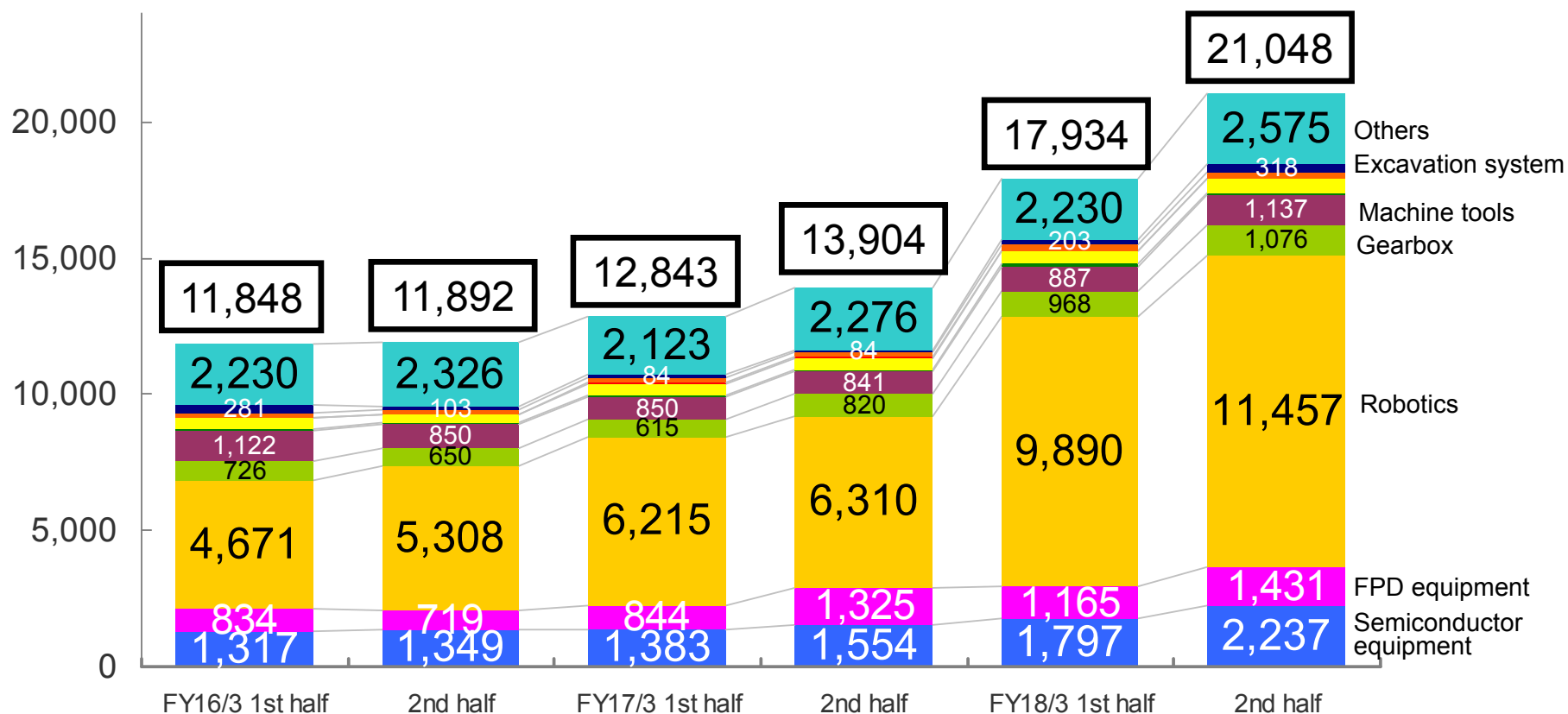
# Non-consolidated results for FY2018/3 (year-on-year change)

(millions of yen)

	FY2017/3		FY2018/3		Year-on-year change	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate (%)
Net sales	26,747	100.0	38,982	100.0	12,234	45.7
Operating income	6,568	24.6	11,016	28.3	4,448	67.7
Ordinary income	7,233	27.0	11,044	28.3	3,811	52.7
Net income	5,206	19.5	7,788	20.0	2,581	49.6
EPS (yen)	56.85	—	83.97	—	27.13	47.7
Capital investment	3,453	—	6,523	—	3,069	88.9
Depreciation costs	1,181	—	1,634	—	452	38.3
R&D costs	1,355	—	1,368	—	13	1.0

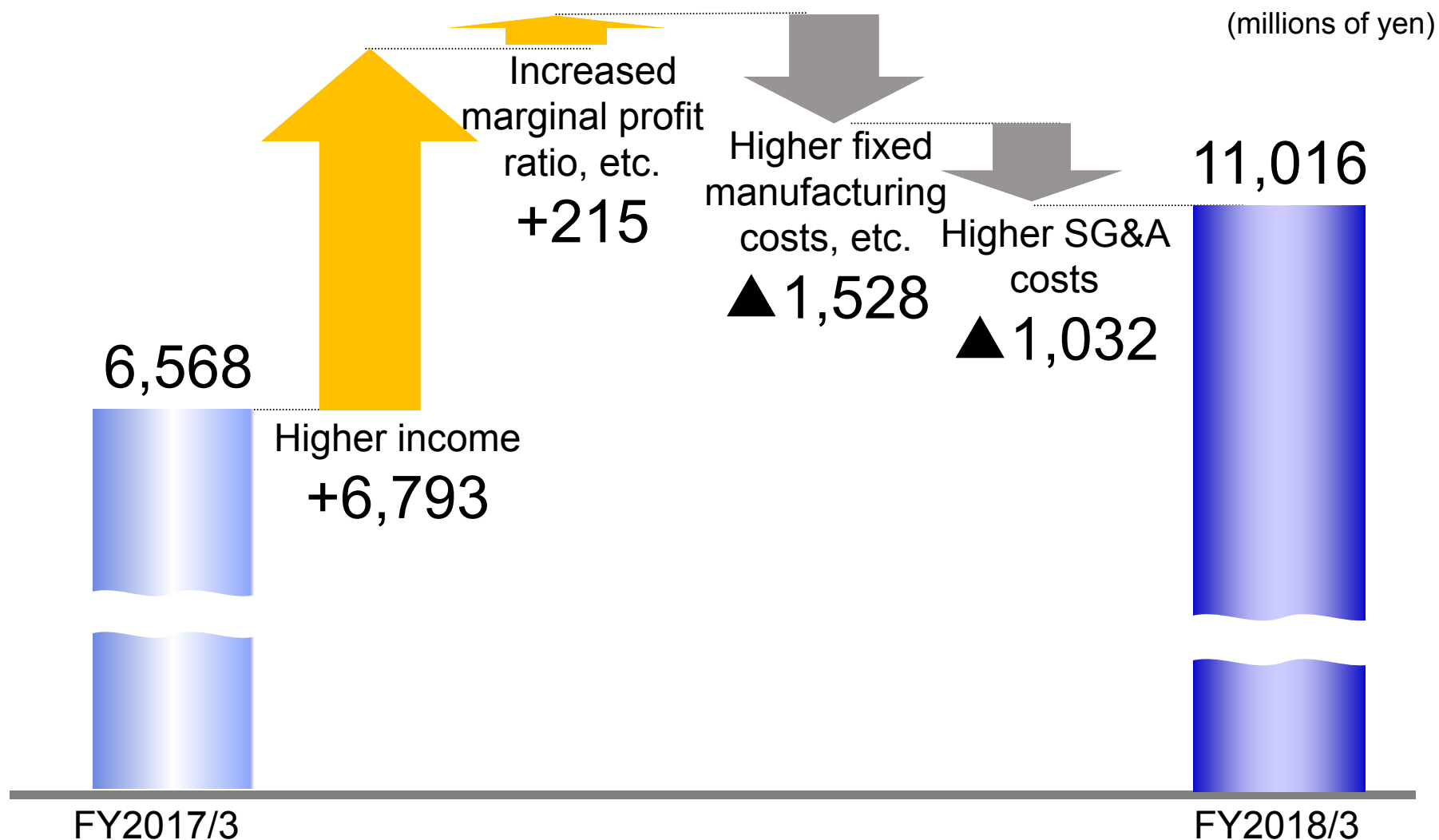
# Net sales by application (non-consolidated)

(millions of yen)



- Semiconductor equipment
- Flat panel display equipment
- Robotics
- Gearbox for motor manufactures
- Machine tools
- Printing machines
- Optical devices
- Transporter
- Measuring machines
- Excavation system for the oil, etc.
- Others

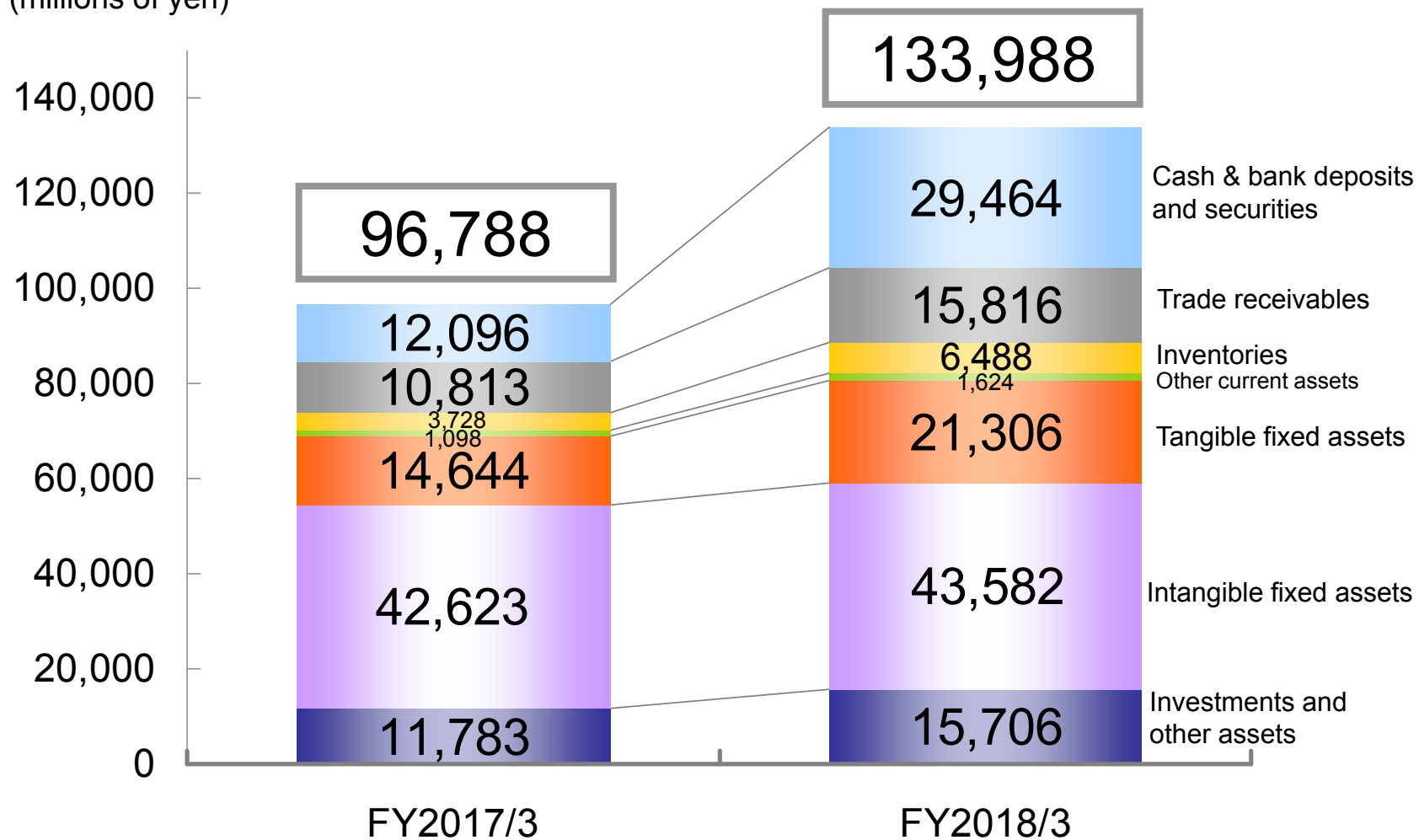
# Factors in year-on-year change in non-consolidated operating income (FY2018/3)





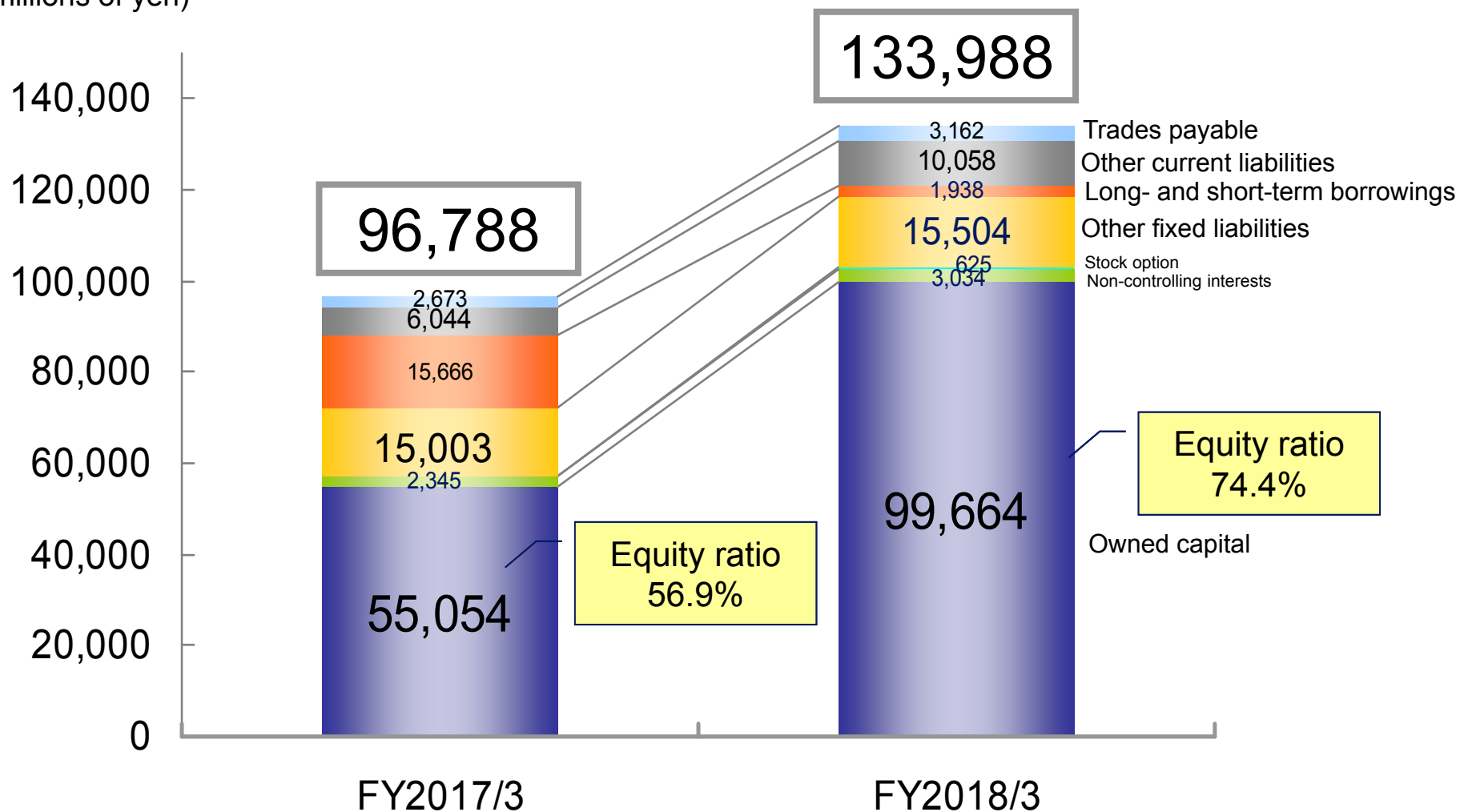
# Status of consolidated assets

(millions of yen)



# Status of consolidated liabilities and net assets

(millions of yen)



# Status of consolidated cash flows

(millions of yen)	FY2017/3	FY2018/3
Cash flow from operating activities	7,225	9,233
Cash flow from investing activities	▲32,522	▲8,171
Cash flow from financing activities	24,648	17,493
Effect of exchange rate changes on cash and cash equivalents	▲121	95
Net increase (decrease) in cash and cash equivalents	▲770	18,651
Cash and cash equivalents at end of year	9,668	28,320

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# Performance Forecasts for FY 2019/3

# Consolidated performance forecasts for FY 2018/3

(millions of yen)

	FY2018/3		FY2019/3 forecasts		Year-on-year change	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate (%)
Net sales	54,339	100.0	68,500	100.0	14,160	26.1
Operating income	12,598	23.2	17,400	25.4	4,801	38.1
Ordinary income	12,228	22.5	17,600	25.7	5,371	43.9
Net income	8,059	14.8	11,500	16.8	3,440	42.7
EPS (yen)	86.9	—	119.46	—	32.56	37.5
Capital investment	8,757	—	24,000	—	15,242	174.1
Depreciation costs	5,852	—	6,500	—	647	11.1
R&D costs	2,114	—	2,750	—	635	30.0

Assumed exchange rate for FY19/3 forecasts 1USD = ¥105.00 1EUR = ¥130.00 1CNY=¥16.00

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.

# FY 2019/3 forecasts for main group firms

(millions of yen)

		Equity stake	Net sales		Net income	
			Amount	Year-on-year change (%)	Amount	Year-on-year change (%)
	Harmonic Drive Systems Inc.	—	50,000	28.3	10,000	28.4
*2 *5	HD Systems, Inc. (Harmonic Drive L.L.C.) (U.S.A)	100% (51%)	6,100	10.4	250	3.5
	Harmonic AD, Inc.	100%	2,900	4.3	260	5.9
*3	Harmonic Drive Systems (Shanghai) Co., Ltd.	100%	5,200	12.0	100	▲64.5
*4 *6	Harmonic Drive AG (Germany)	74.7%	15,800	16.0	2,400	17.4

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

\*2 Exchange rates: FY17/12 1USD = 112.19yen, FY18/12 (forecast) 1USD = 105.00yen

\*3 Exchange rates: FY17/12 1CNY = 16.63yen, FY18/12 (forecast) 1CNY = 16.00yen

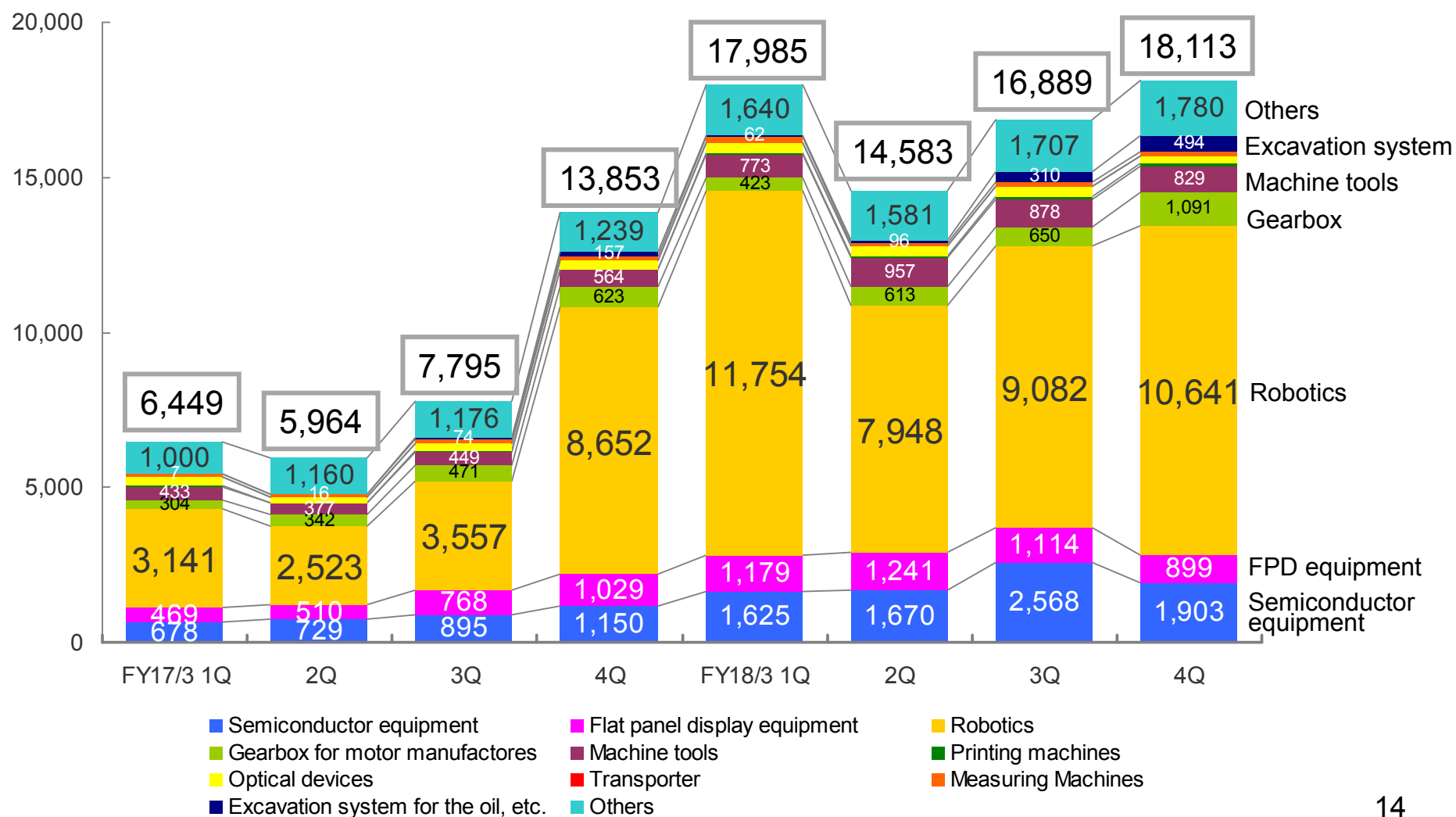
\*4 Exchange rates: FY17/12 1EUR = 126.67yen, FY17/12 (forecast) 1EUR = 130.00yen

\*5 Net income of US subsidiaries (consolidated) is after excluding non-controlling interests.

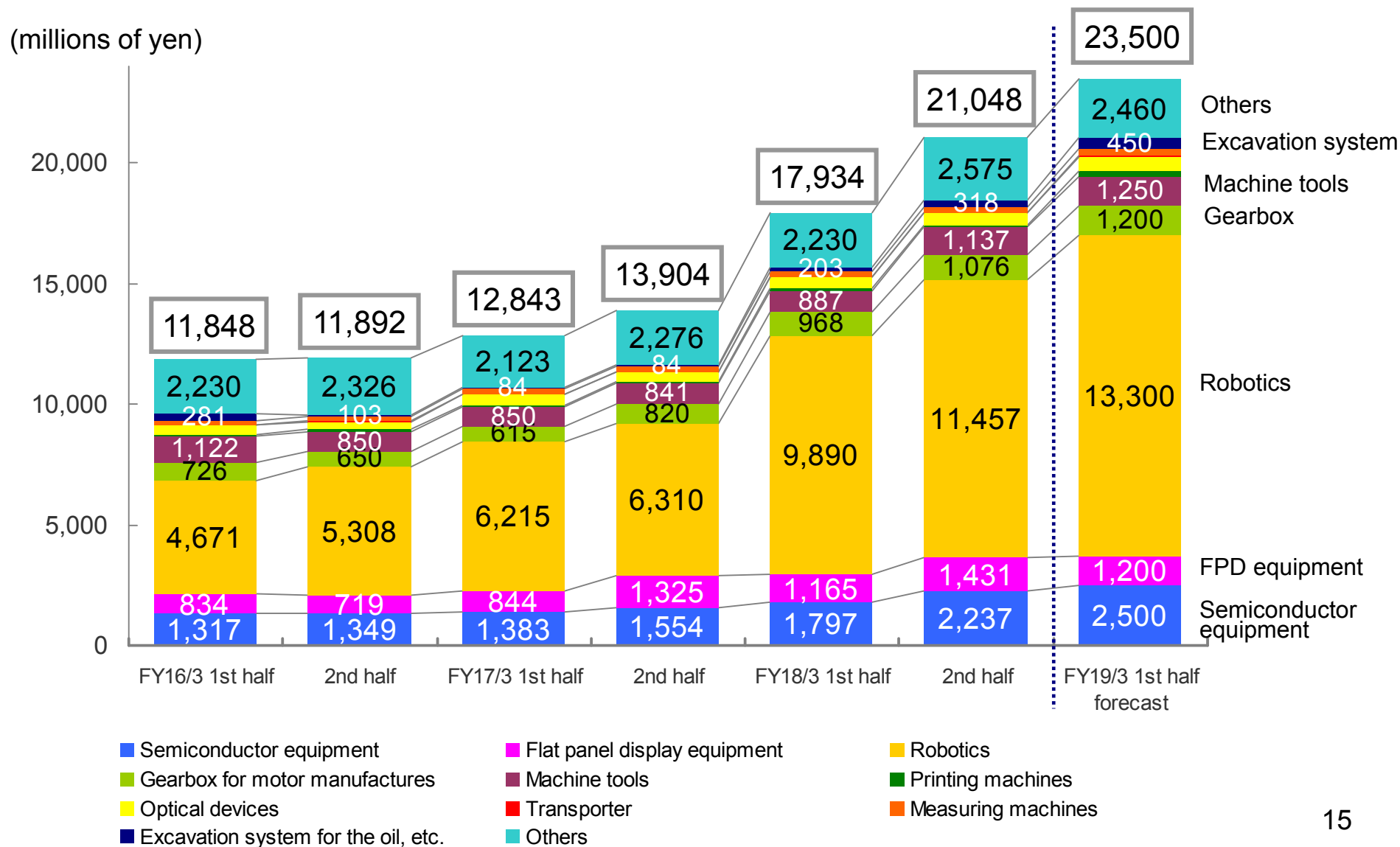
\*6. Net income of German subsidiaries (consolidated) is before excluding non-controlling interests .

# Non-consolidated bookings by application (quarterly)

(millions of yen)



# Non-consolidated Sales by application (by half-year)





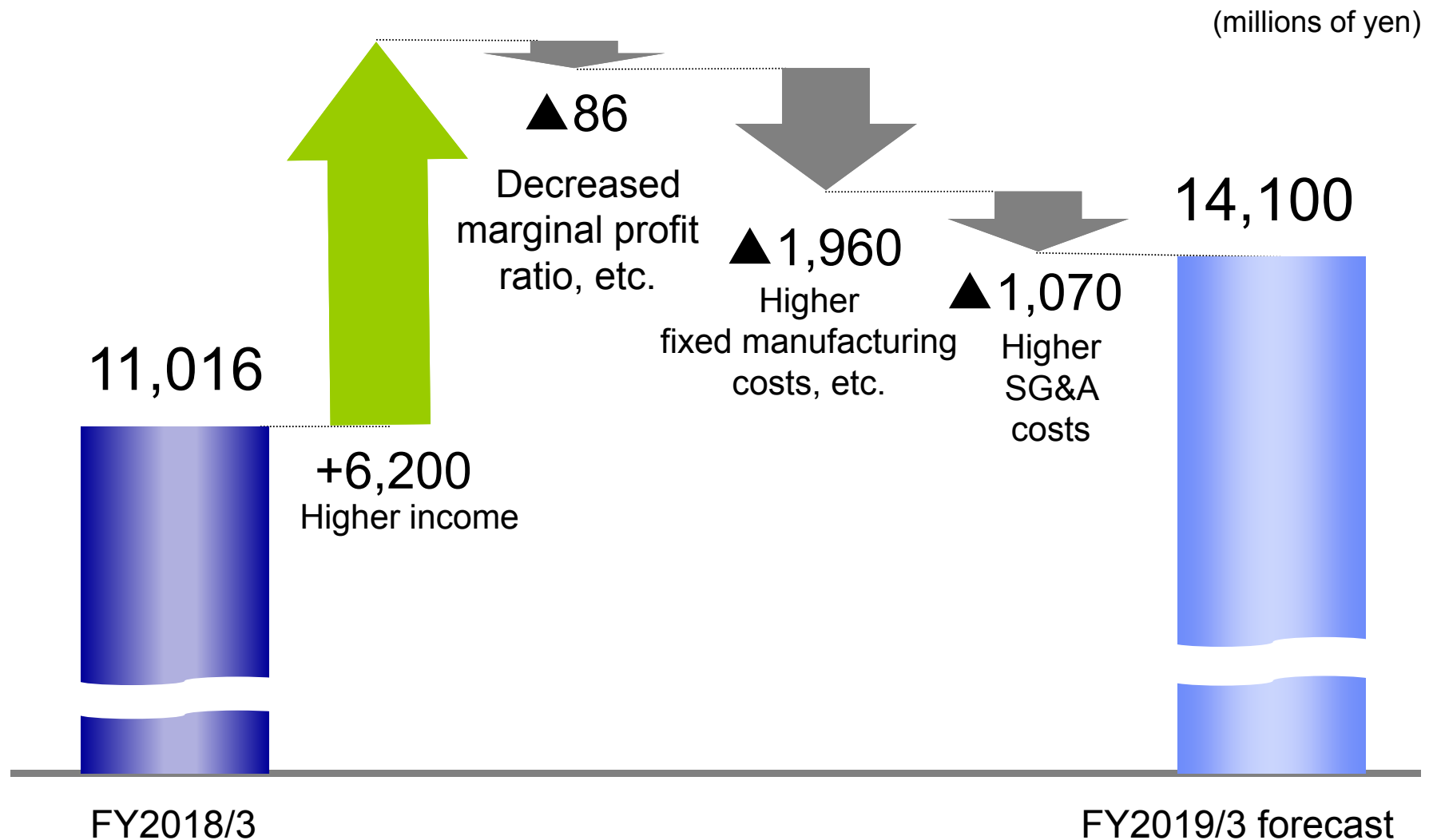
# Non-consolidated performance forecasts for FY 2019/3

(millions of yen)

	FY2018/3		FY2019/3 forecasts		Year-on-year change	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate (%)
Net sales	38,982	100.0	50,000	100.0	11,017	28.3
Operating income	11,016	28.3	14,100	28.2	3,083	28.0
Ordinary income	11,044	28.3	14,300	28.6	3,255	29.5
Net income	7,788	20.0	10,000	20.0	2,211	28.4
EPS (yen)	83.97	—	103.88	—	19.91	23.7
Capital investment	6,523	—	18,000	—	11,476	175.9
Depreciation costs	1,634	—	2,600	—	965	59.1
R&D costs	1,368	—	1,700	—	331	24.2

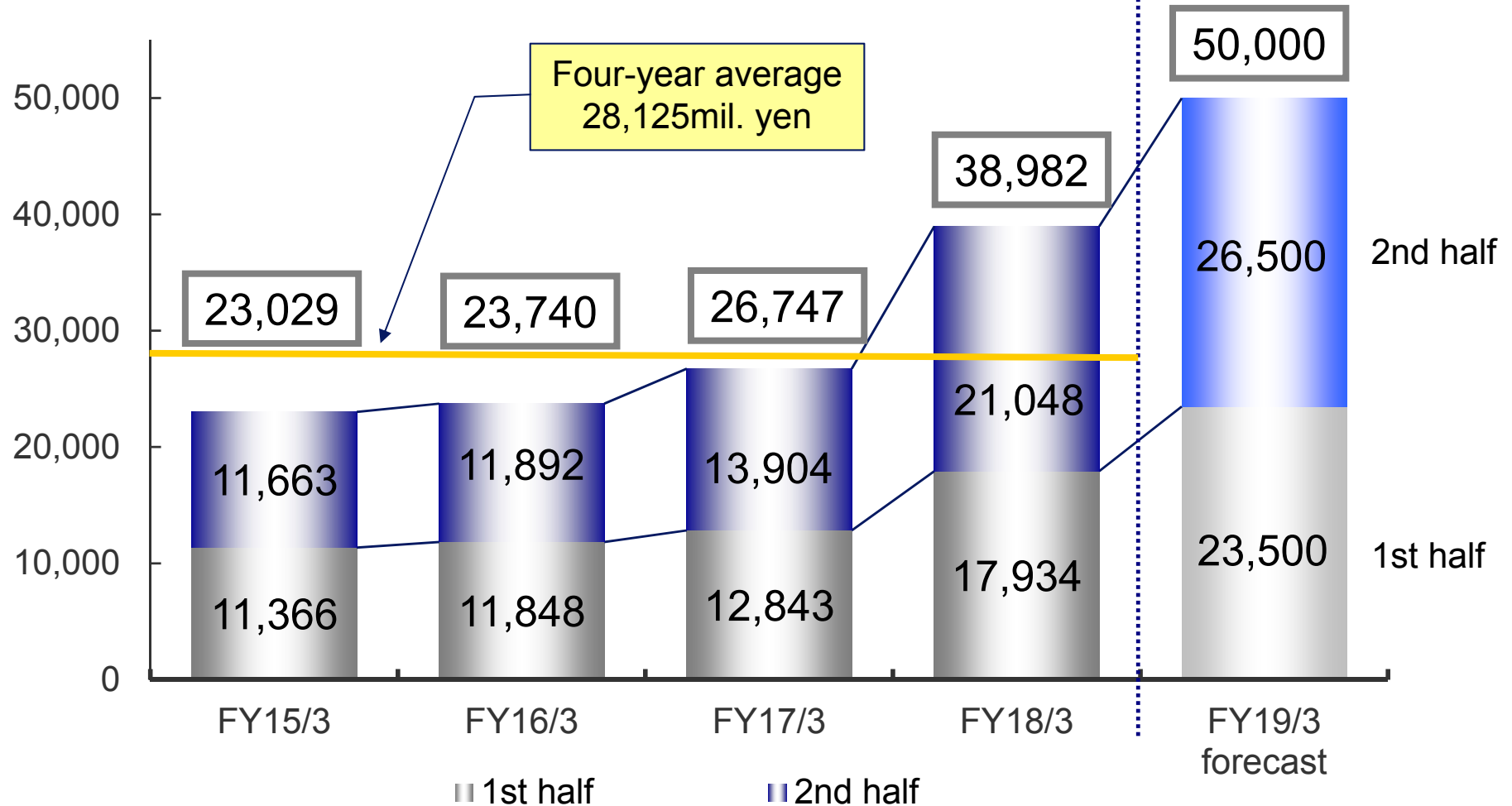
Assumed exchange rate for FY19/3 forecasts 1USD = ¥105.00 1EUR = ¥130.00 1CNY = ¥16.00


# Factors in year-on-year change in non-consolidated operating income (FY 2019/3 forecast)



# Sales trend line (non-consolidated)

(millions of yen)



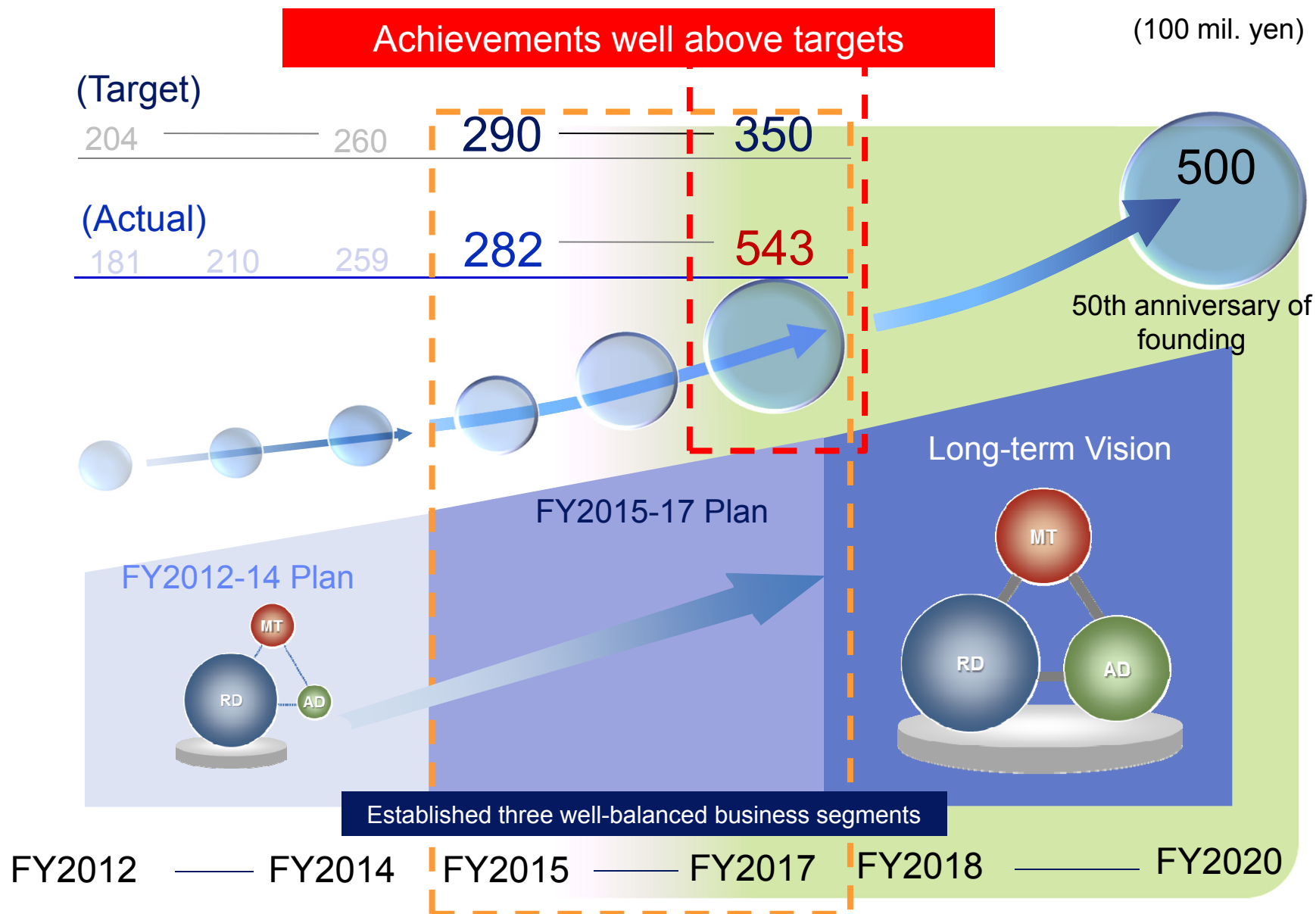
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# New Mid-term Management Plan and Long-term Vision



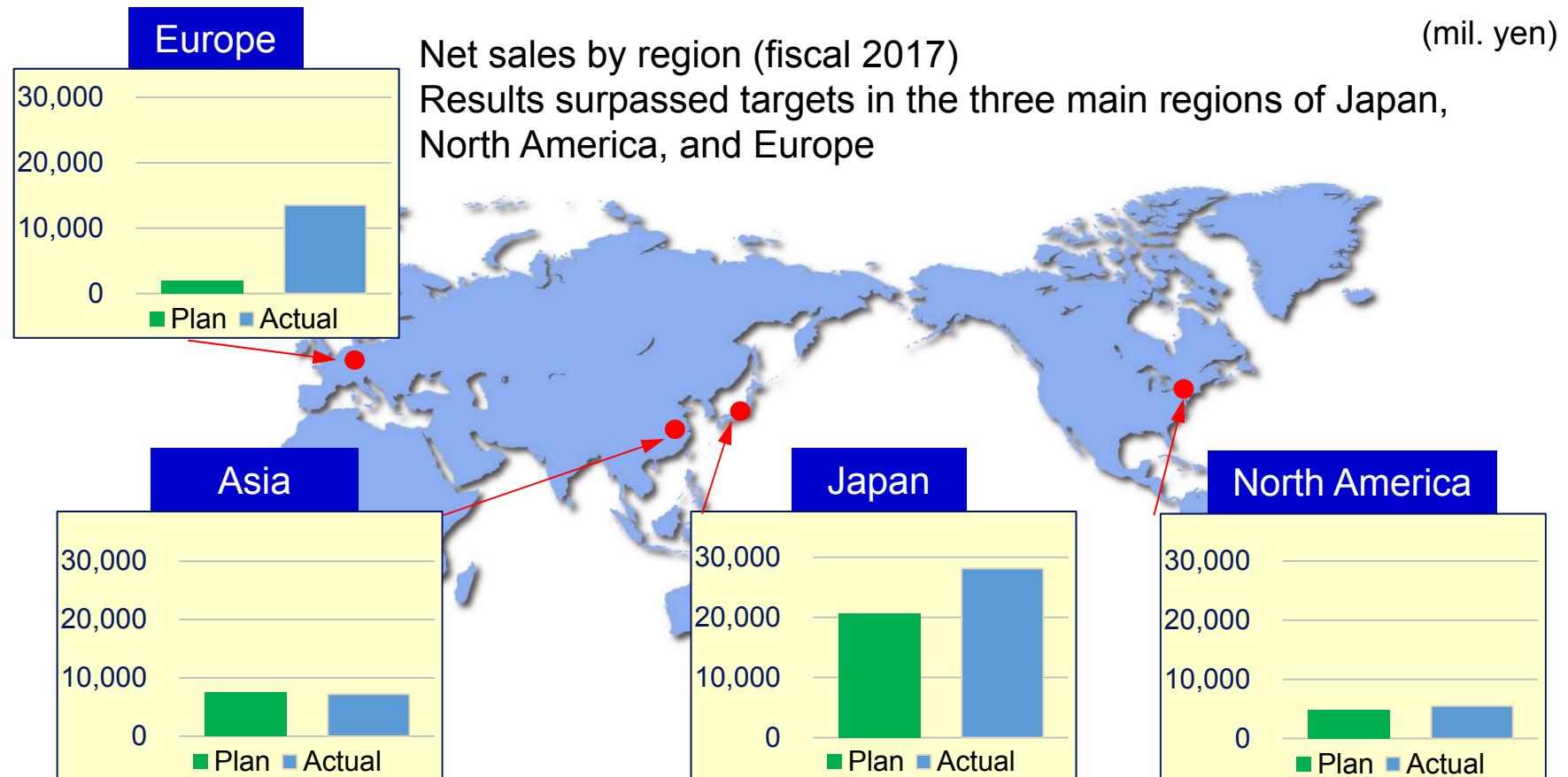
# 1. Looking Back at the Previous Mid-term Management Plan (fiscal years 2015-2017)

# Targets and actual results of previous Mid-term Management Plans (consolidated)



# Main factors for achieving consolidated sales above target

1. Business growth: Sharp rise in demand for use in industrial robots and other main applications
2. M&A benefits: German affiliate made a subsidiary



# Revenue targets and results (consolidated)

(mil. yen)

	Fiscal 2017					
	Mid-term management plan		Actual		Vs. original plan	
	Amount	Percent (%)	Amount	Percent (%)	Increase amount	Rate of increase
Net sales	35,000	100.0	54,339	100.0	19,339	55.3
Operating income	9,500	27.1	12,598	23.2	3,098	32.6
Current net income	7,000	20.0	8,059	14.8	1,059	15.1

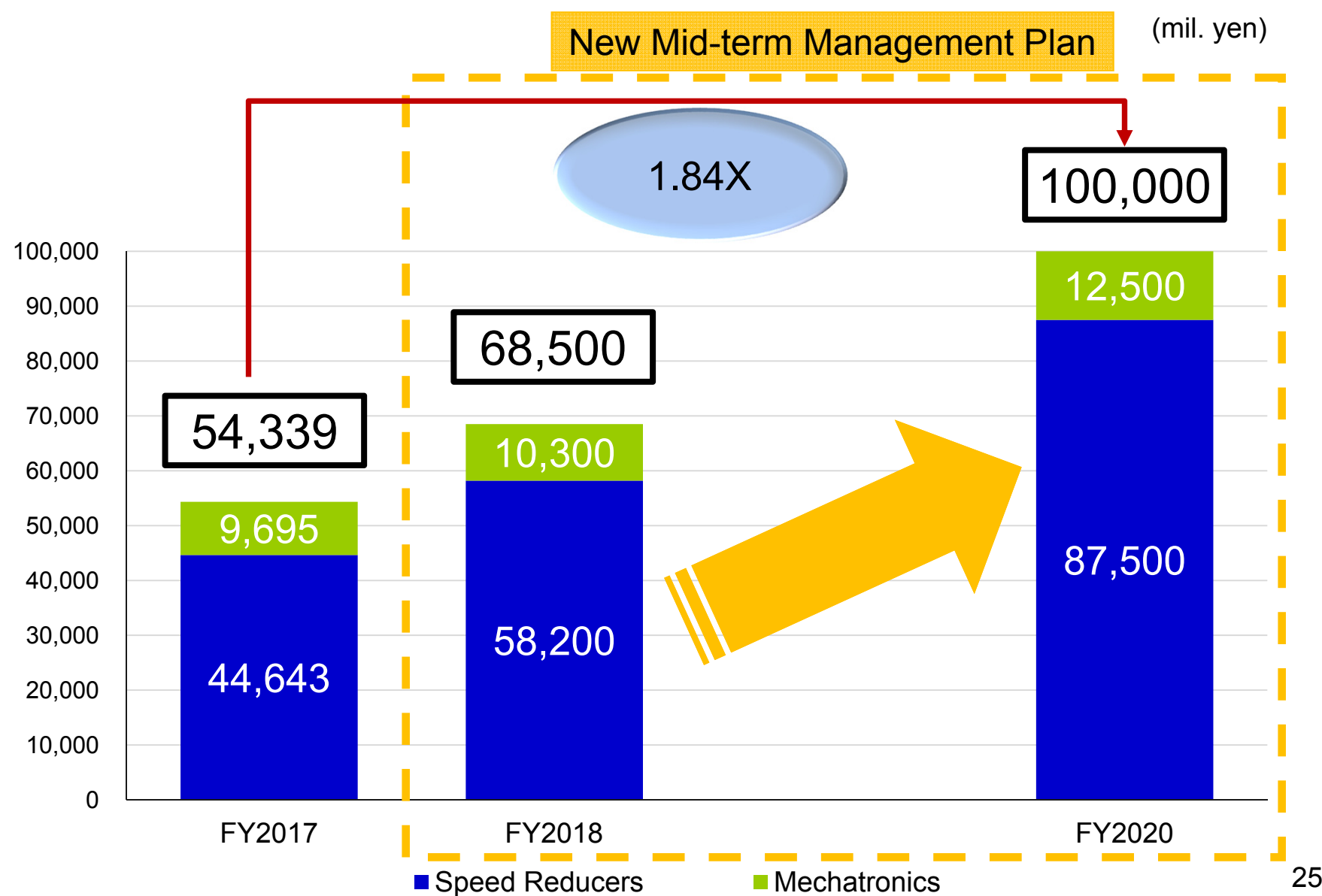
	Cumulative total for three years of Mid-term Plan (Planned for fiscal years 2015-2017)	Cumulative total for three years of Mid-term Plan (Results for fiscal years 2015-2017)
Capital investment amount	10,000	17,630
Depreciation and amortization costs	6,000	9,150
R&D costs	4,800	4,902



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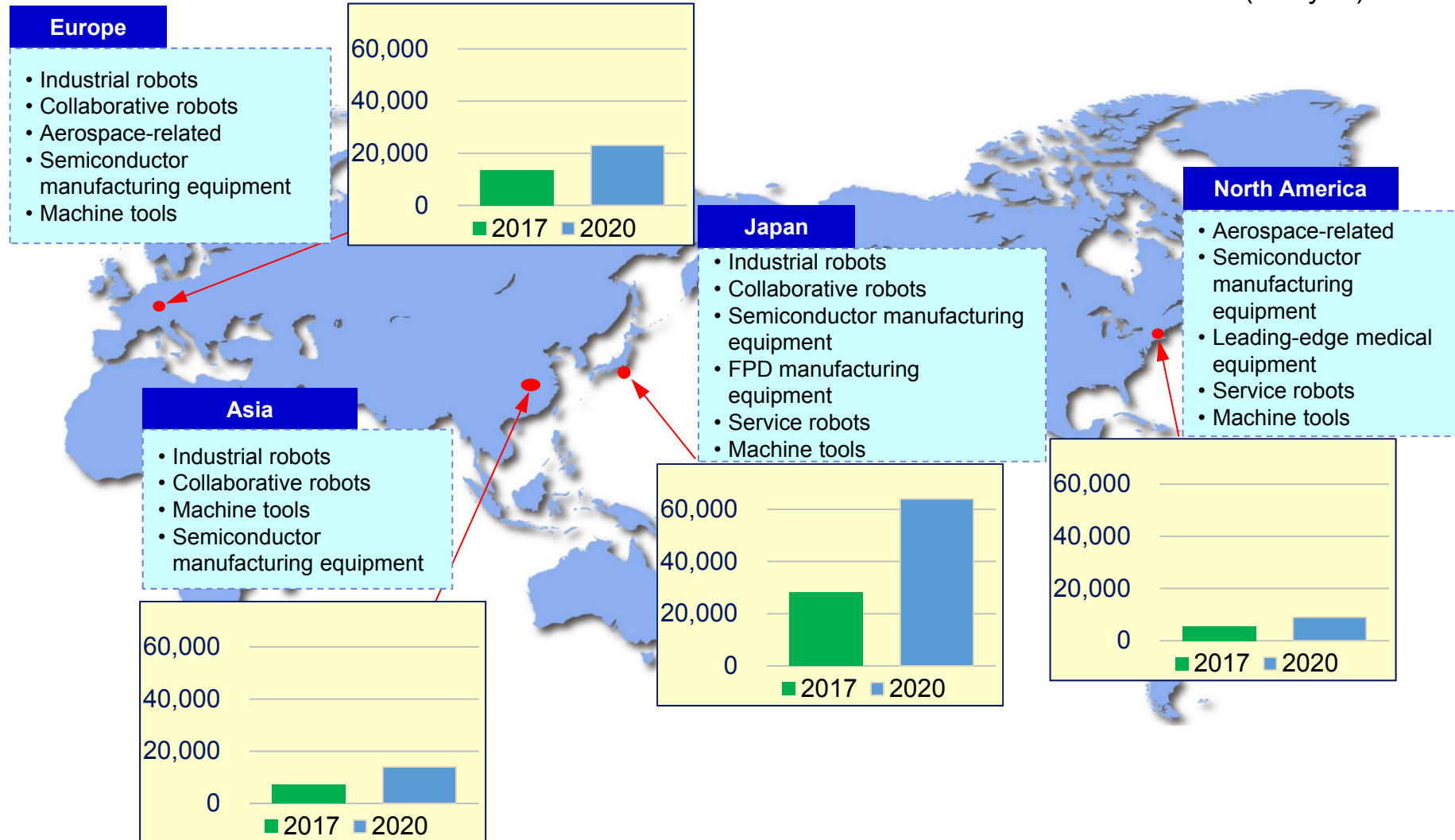
## 2. New Mid-term Management Plan (fiscal years 2018-2020)

# Target net sales (consolidated)



# Net sales targets and main applications in each region


(mil. yen)



# Revenue targets (consolidated)

(mil. yen)

	Fiscal 2017 (actual)		Fiscal 2018 (forecast)		Fiscal 2020 (planned)	
	Amount	Percent (%)	Amount	Percent (%)	Amount	Percent (%)
Net sales	54,360	100.0	70,000	100.0	100,000	100.0
Operating income	12,598	23.2	17,500	25.0	26,000	26.0
Current net income	8,059	14.8	11,500	16.4	17,000	17.0



	Cumulative total for three years of previous Mid-term Plan (Results for fiscal years 2015-2017)	Cumulative total for three years of new Mid-term Plan (Planned for fiscal years 2018-2020)
Capital investment amount	17,630	71,000
Depreciation and amortization costs	9,150	25,500
R&D costs	4,902	9,450

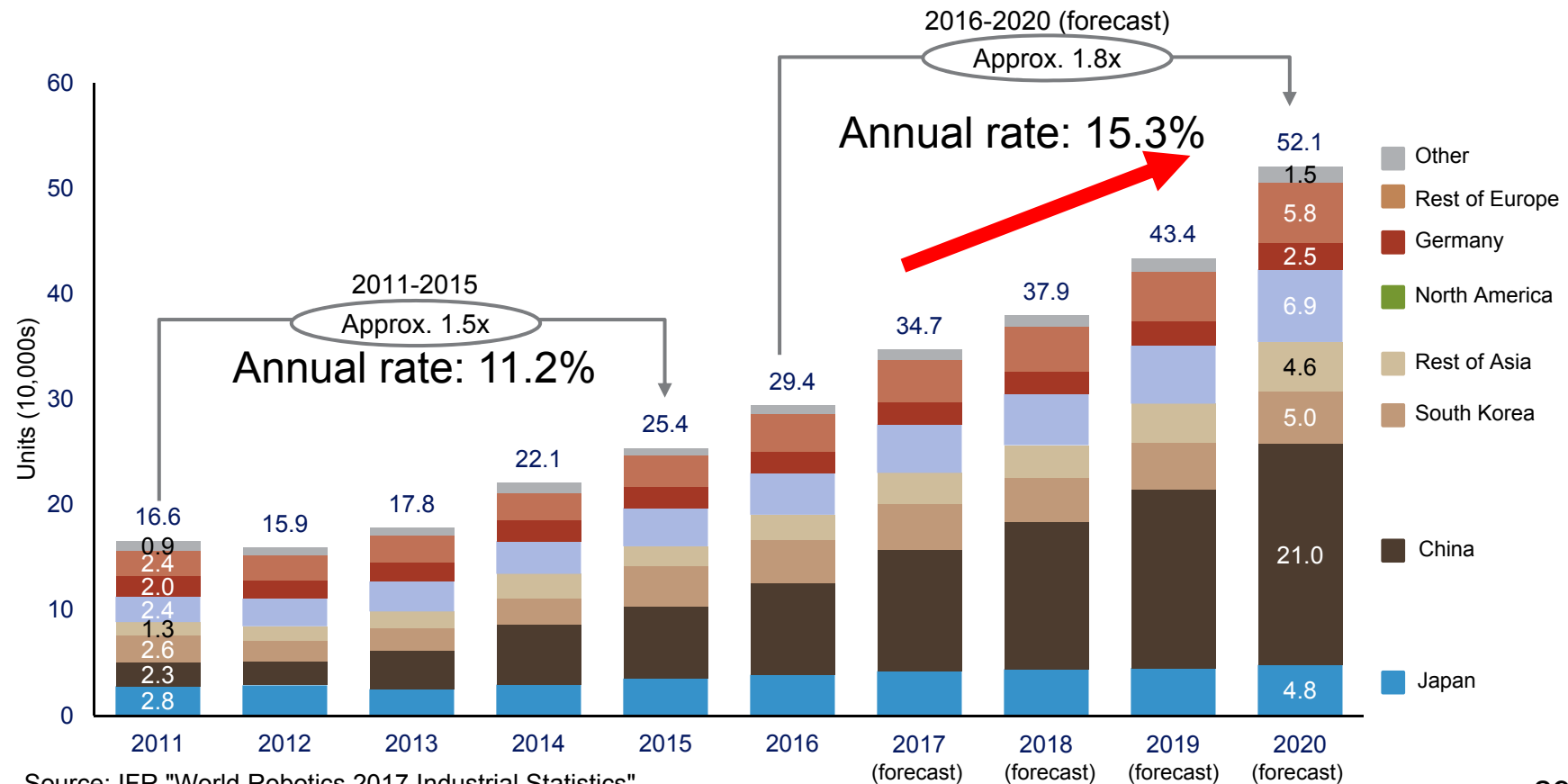
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# Trends in main application fields

# 1. Industrial robots

- Market expected to expand 15% annually even after 2018 (IFR forecast)
- Changes in China's industrial structure with Made in China 2025

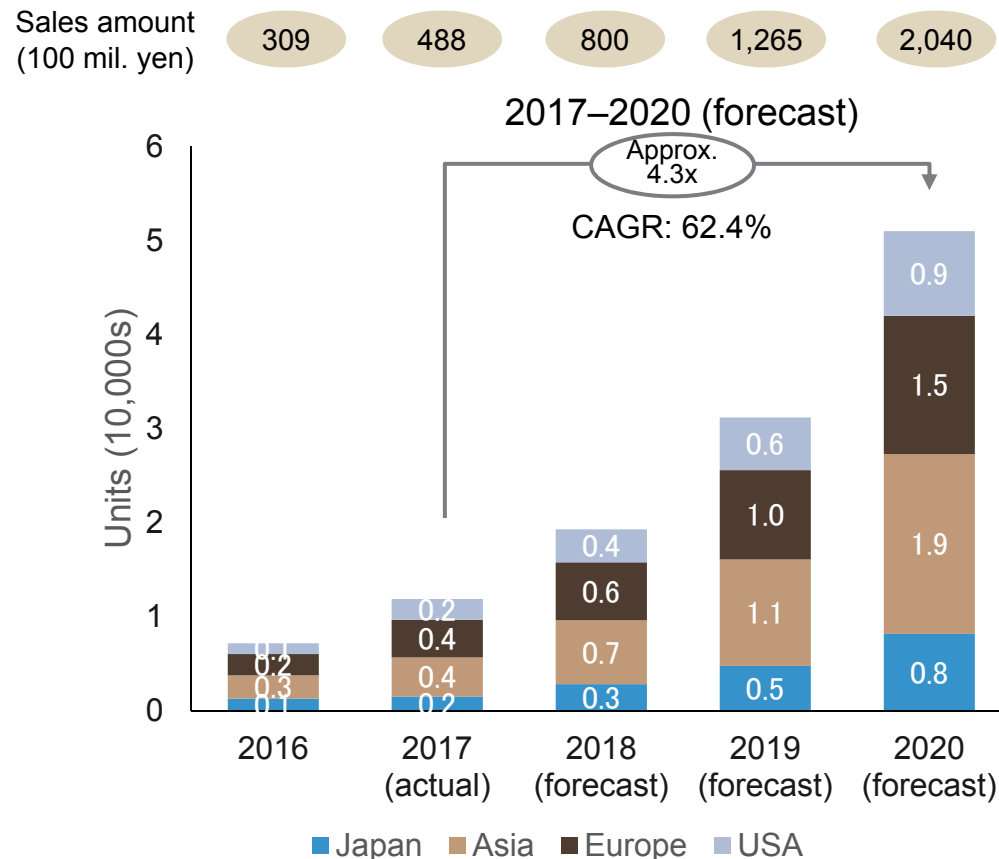
## Worldwide outlook for number of industrial robots sold



## 2. Collaborative robots (co-bots)

- Examples of expanding adoption in manufacturing and service industries
- Becoming drivers of further growth

### Co-bots market size outlook (sales amount, units)

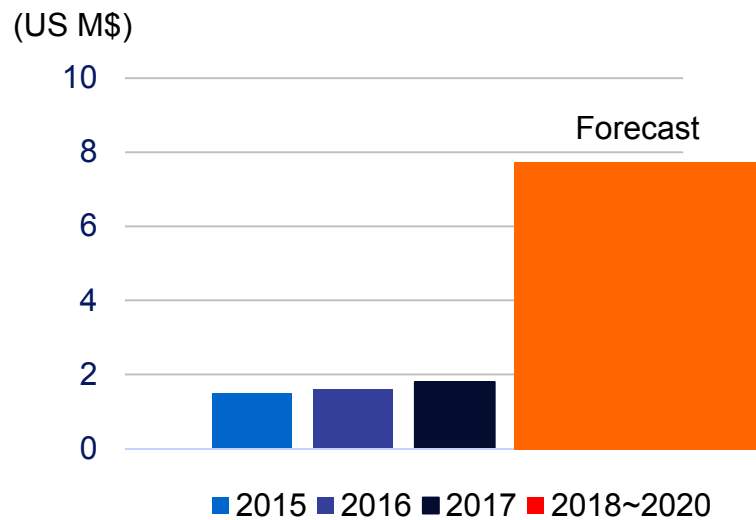


Source: Fuji Keizai Group, Reality and Outlook of Worldwide Robot-related Markets 2018: No.1 Factory Automation Robots Market

### 3. Service robots

- Robotics technology is playing an active role in medical practice
- Use of power assistance is expanding in physical therapy clinics and for easing the burden of carrying heavy objects
- Health insurance applicability to surgery assistance robots is growing

#### Market forecast for surgical robots



Source: IFR "World Robotics 2017 Industrial Statistics"

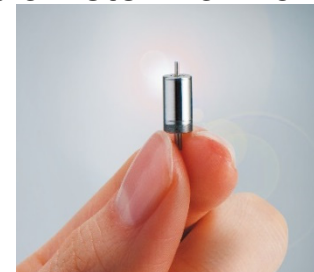
Surgical robots



Power assist suits



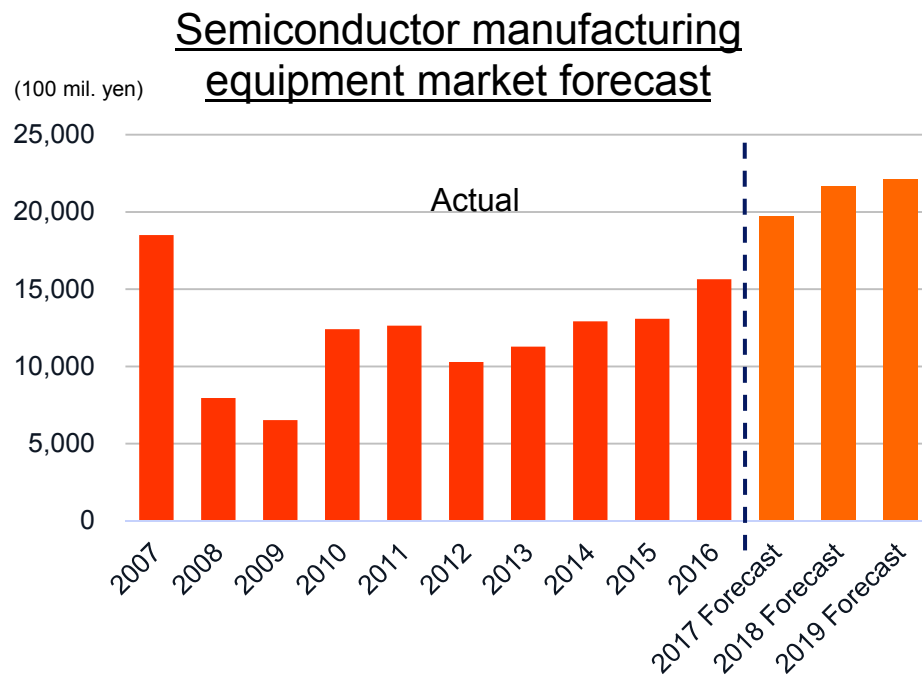
5mm diameter HarmonicDrive®



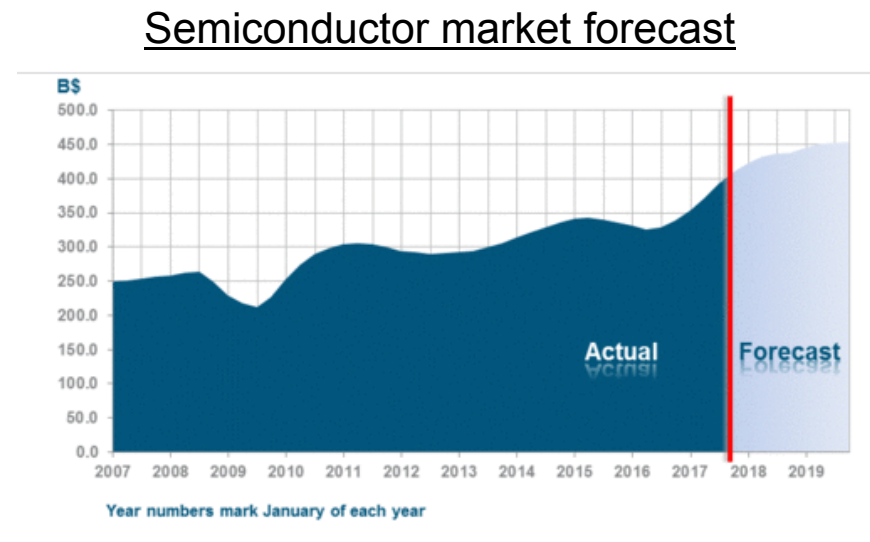


## 4. Semiconductor manufacturing equipment

- Investment in layering and miniaturization through capacity increases and high quality
- Growing demand for semiconductors used in artificial intelligence (AI) and virtual reality (VR)
- Full-scale investment in 5G-related technology
- Increase in server demand due to data explosion, and switch from HDD to SSD



Source: Semiconductor Equipment Manufacturing Association of Japan

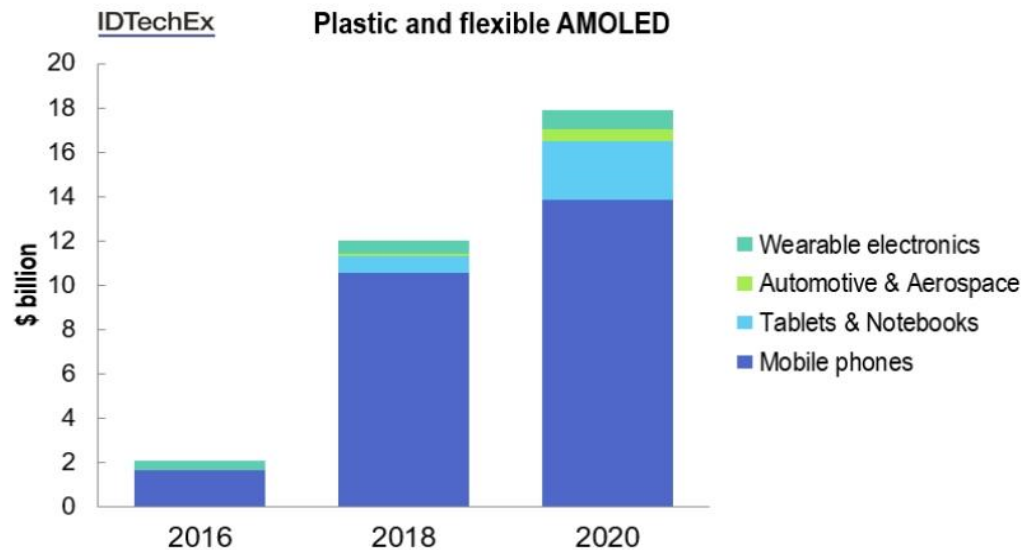


Source: WSTS

## 5. LED and OLED manufacturing equipment

- Slowdown in growth of small and midsize OLED panels  
(lower demand for smaller OLED panels with scaling back of iPhone-X production)
- Chinese LED and OLED manufacturers continue to invest in production

### OLED market forecast



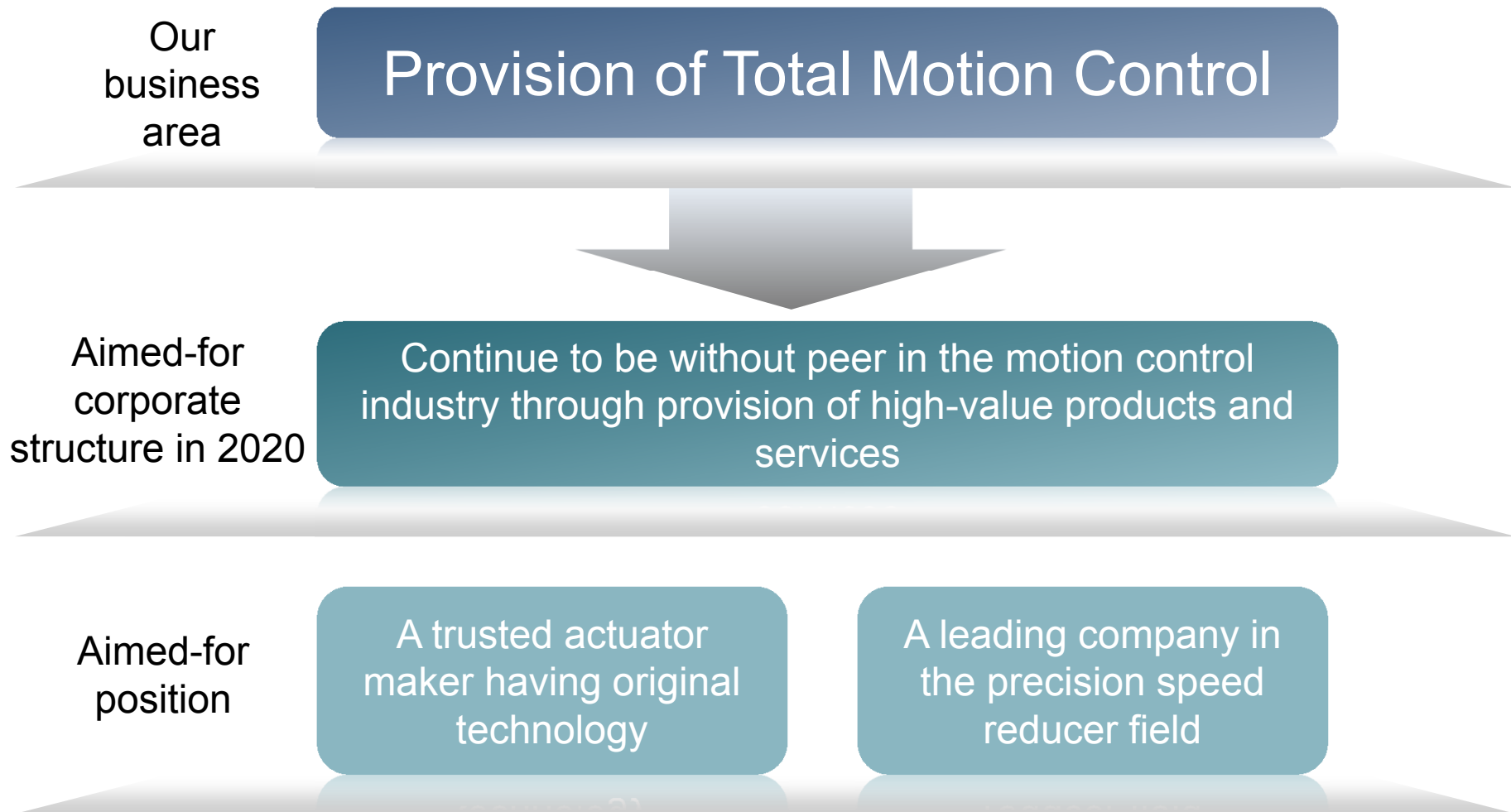
Source: IDTechEX



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# **New Mid-term Management Plan Basic Policies**

# Aimed-for corporate structure and industry position in 2020



# Basic Policies of New Mid-term Management Plan

## 50th anniversary of founding

Seizing the rapidly expanding growth opportunities, advance to the next stage

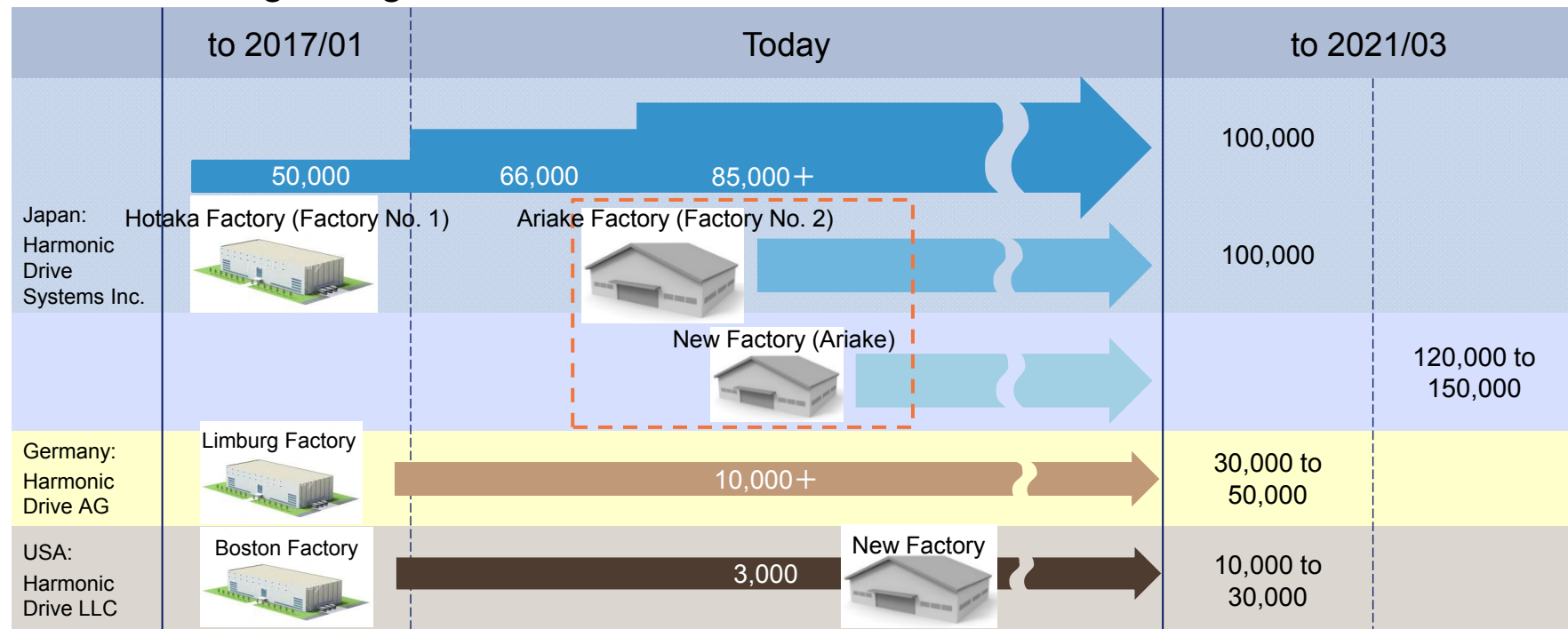


# 1 Major increase in global production capacity

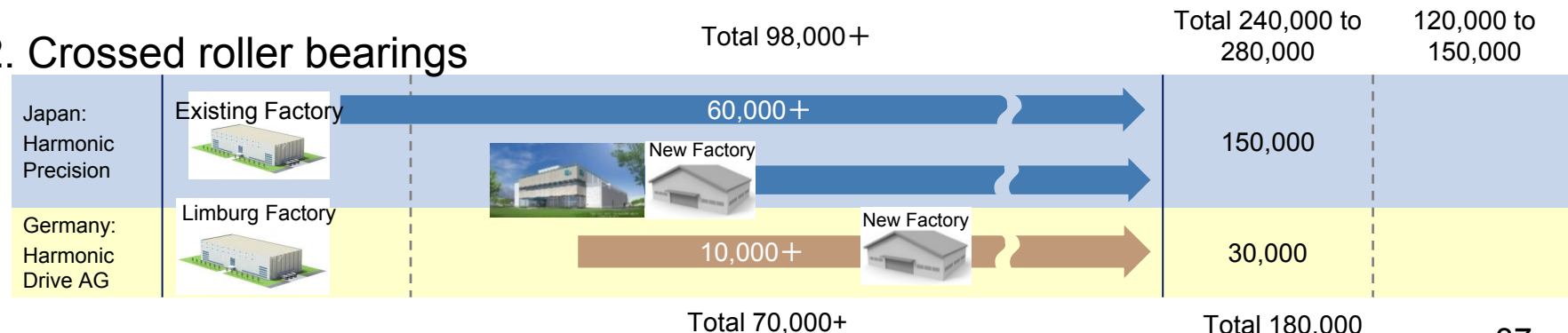
## 1. Roadmap to raising production capacity

### 1. Strain wave gearing devices

(numeric data is monthly units produced)



### 2. Crossed roller bearings

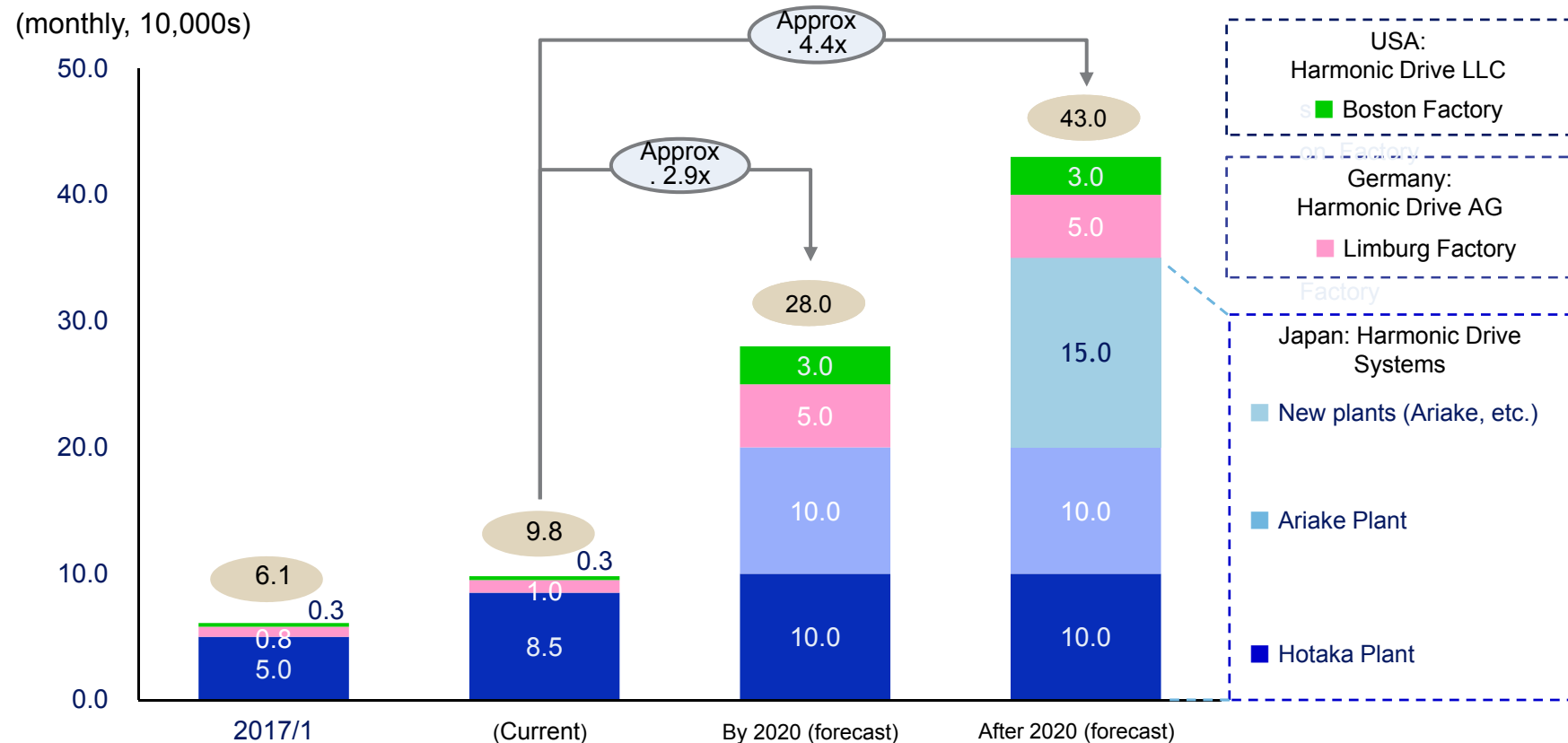


# 1 Major increase in global production capacity

## 2. Toward capacity of 280,000/month by 2020

We are aiming for higher corporate value by establishing supply capacity to meet growing demand and by further building our competitive strength

Plans for boosting production capacity of our precision speed reducers



# **1** Major increase in global production capacity

## 3. Productivity improvements

1. Enhancement of automated lines
2. Promotion of multi-skilled workers
3. Unflagging pursuit of improvements in fabrication, assembly, and inspection processes

Ariake Factory

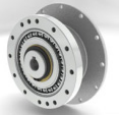

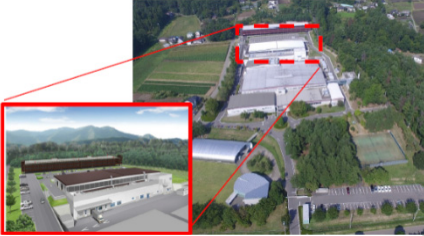
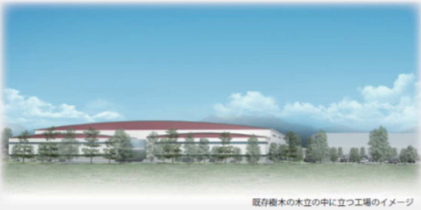
















# 2

## Raising the capability of each Group company and building greater comprehensive strength

### Main manufacturing sites

In Japan	 <p>HarmonicDrive®</p>  <p>Harmonic Drive Systems (Hotaka Factory) (Ariake Factory)</p>  <ul style="list-style-type: none"> <li>• New line: equipment installation completed</li> <li>• By March 2019, monthly production of 100,000 units</li> </ul>  <ul style="list-style-type: none"> <li>• Production started March 2018</li> <li>• By March 2021, monthly production of 100,000 units</li> </ul>	 <p>Crossed roller bearings</p>  <p>Harmonic Precision (Matsumoto Factory)</p>  <ul style="list-style-type: none"> <li>• New plant building under construction</li> <li>• By March 2023, monthly production of 150,000 units</li> </ul>	 <p>HarmonicPlanetary®</p>  <p>Harmonic AD (Toyoshina Factory)</p>  <ul style="list-style-type: none"> <li>• Planning phased investment in new production equipment in line with demand growth</li> </ul>
Overseas	 <p>USA: Harmonic Drive LLC</p>  <ul style="list-style-type: none"> <li>• Plan to acquire land for new plant in Beverly, Massachusetts (artist rendition of new plant)</li> </ul>	 <p>Germany: Harmonic Drive AG</p>  <ul style="list-style-type: none"> <li>• Can expand to land adjoining existing plants</li> </ul>	 <p>South Korea: SAMICK ADM</p>  <ul style="list-style-type: none"> <li>• Planning phased investment in new production equipment in line with demand growth</li> </ul>

## **3****4** Basic Policies of Mid-term Management Plan

**3**

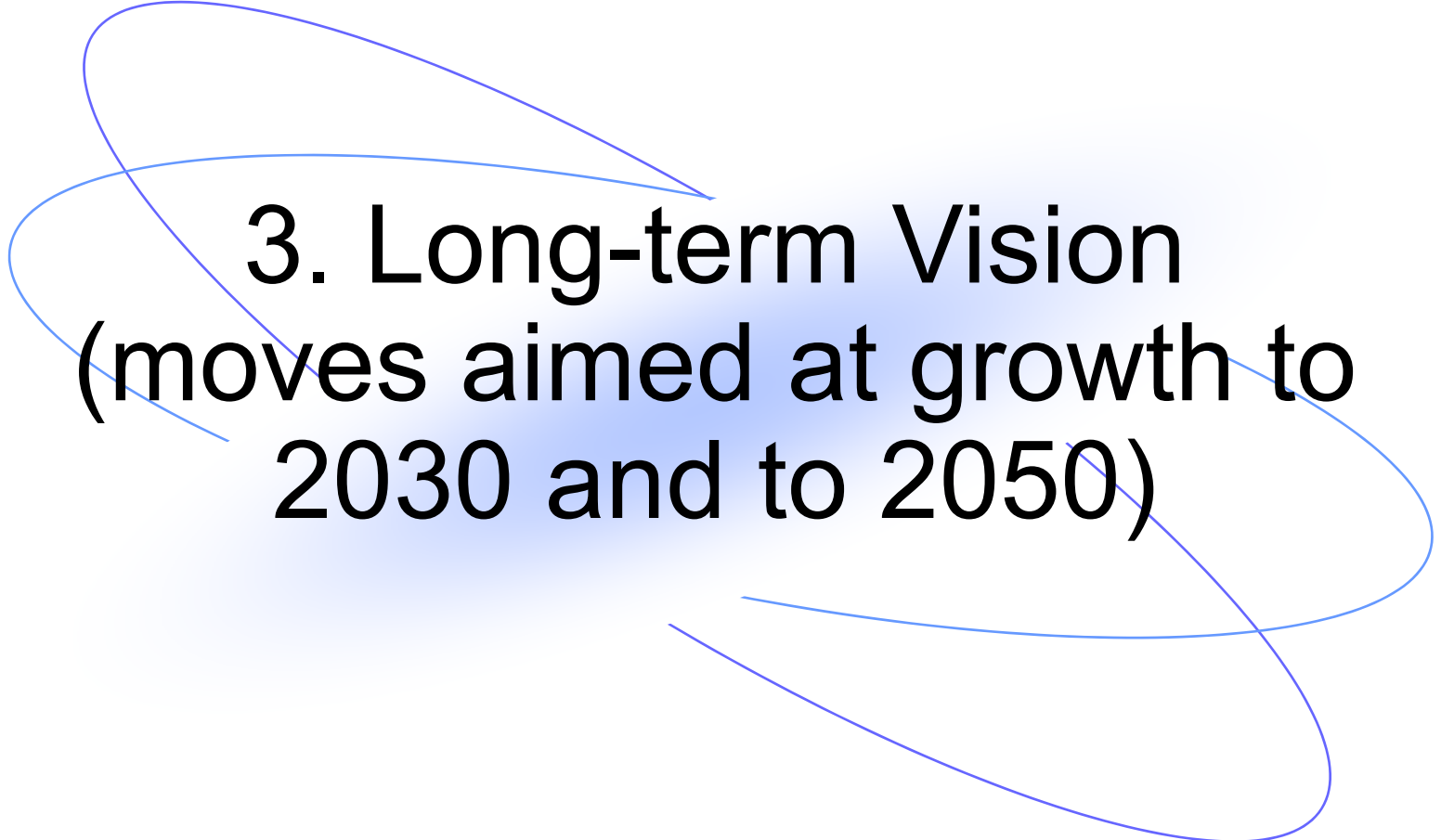
Improve customer satisfaction by raising QCDS capability

- Normalize and reduce lead time from order to shipment
- Actively develop and market new products
- Build technology proposal strength and support capability

**4**

Strengthen the business foundation underlying growth

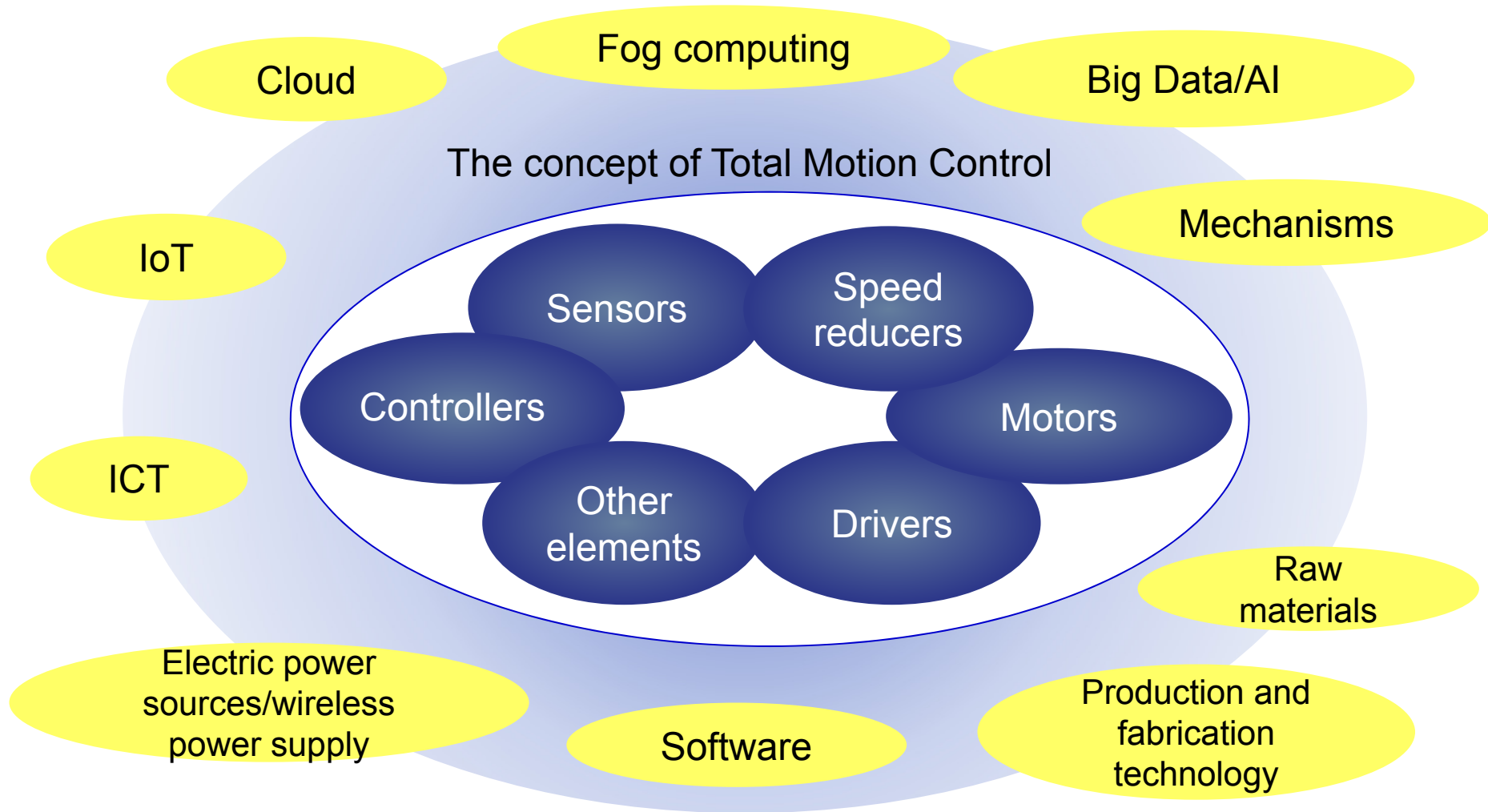
- Acquire and train human resources in line with sound growth
- Enhance business management platform drawing on IT
- Promote business management with the environment, society, and governance in mind

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### 3. Long-term Vision (moves aimed at growth to 2030 and to 2050)

# Our business areas

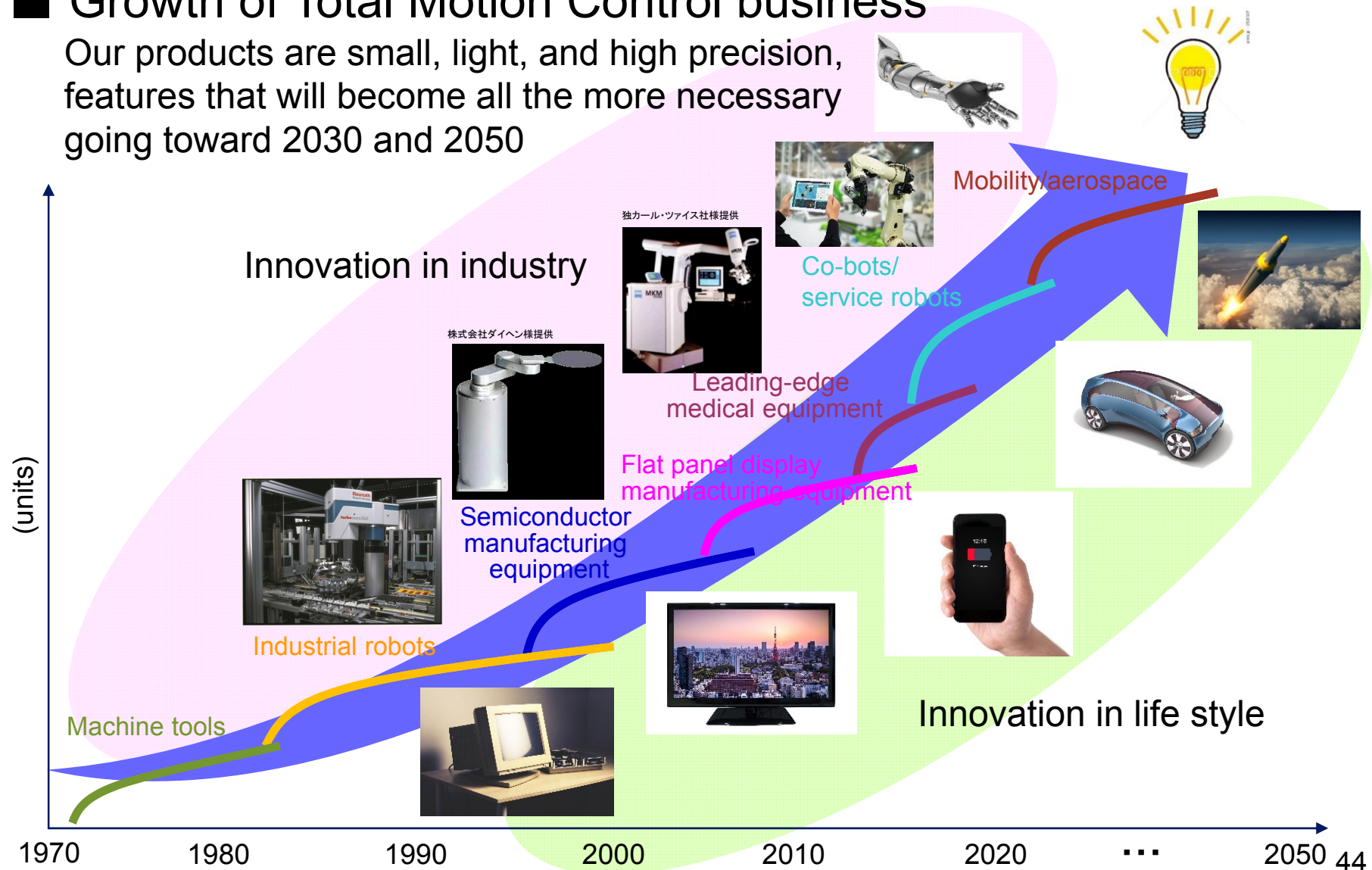
## Provision of Total Motion Control



# Expanding business opportunities

## ■ Growth of Total Motion Control business

Our products are small, light, and high precision, features that will become all the more necessary going toward 2030 and 2050



# Taking on the challenge of change to innovative technologies

## Future-oriented moves

As the pace of innovation in society accelerates, we will foster an institutional climate able to meet changes, with our antenna raised high and even daring to try creative destruction

- Deepen and expand joint development activities with SRI International
  - Accelerate development of the Abacus drive and bring to market
  - Expand the scope of joint development to other transmissions
- Take on the challenge of, and keep a close eye on, new materials and new principles
- Promote active access to peripheral technologies
- Promote exchanges with research institutions and other industries



# Aim for further growth toward 2030 and 2050

Consolidated sales (100 mil. yen)

Planned	204	260	290	350	
Actual	181	210	259	282	300
					<b>545</b>



The performance targets and other numerical data presented herein are forecasts based on information available to the HDS Group at the time this material was prepared, and are subject to the influence of uncertainties including those in the economic and competitive environment. Actual performance may therefore differ materially from the forecasts given in this material.

***Harmonic Drive Systems Inc.***

For more information:

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