Harmonic Drive Systems Inc.

Presentation on Business Results for the 1st-Half of Fiscal Year Ending March 31, 2018

November 17, 2017

This presentation contains forward-looking statements relating to expected future performance as of Nov. 17, 2017. 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

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1st-half consolidated results (versus original forecasts for the period)

(millions of yen)

	Original forecasts (announced May 12)		1st-half FY ending Mar.31,2018		Vs. original forecasts for the period	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate(%)
Net sales	23,800	100.0	25,014	100.0	1,214	5.1
Operating income	5,900	24.8	6,341	25.4	441	7.5
Ordinary income	5,900	24.8	6,219	24.9	319	5.4
Net income	3,400	14.3	3,704	14.8	304	9.0

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

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1st-half consolidated results (year-on-year change)

(millions of yen)

	1st-half FY ended Mar.31,2017		1st-half FY ending Mar.31,2018		Year-on-year change	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate (%)
Net sales	14,550	100.0	25,014	100.0	10,463	71.9
Gross profit	6,896	47.4	12,058	48.2	5,162	74.9
Operating income	3,978	27.3	6,341	25.4	2,363	59.4
Ordinary income	4,163	28.6	6,219	24.9	2,055	49.4
Net income *1	2,752	18.9	3,704	14.8	951	34.6
EPS（yen）	30.05		40.44		10.39	34.6
Capital investment *2	1,671		3,128		1,457	87.2
Depreciation costs	817		1,252		434	53.2
R&D costs	671		714		42	6.3

*1 Net Income refers to net income attributable to owners of parent.

*2 Capital investment amounts are the amounts of tangible and intangible fixed assets acquired in the term.

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Performance of main group companies for 1st-half of fiscal year ending March 31, 2018

(millions of yen)

		Equity stake	Net sales		Net income	
			Amount	Change(%)	Amount	Change(%)
	Harmonic Drive Systems Inc.	—	17,934	39.6	3,628	45.9
*2 *5	HD Systems, Inc. (Harmonic Drive L.L.C.) (U.S.A)	100% (51%)	2,529	9.9	129	4.3
	Harmonic AD, Inc.	100%	1,348	17.2	125	89.6
*3	Harmonic Drive Systems (Shanghai) Co., Ltd.	100%	1,978	114.8	98	—
*4 *6	Harmonic Drive AG (Germany)	74.7%	6,385	14.2	892	▲4.2

Percent change(%) indicates increase or decrease from same period of previous fiscal year.

*1 For overseas subsidiaries and affiliates, the fiscal year ends December 31.
*2 Exchange rates: Jan. – Jun., 2016 1US$ = 111.81 yen, Jan. – Jun., 2017 1US$ = 112.37 yen
*3 Exchange rates: Jan. – Jun., 2016 1CNY = 17.07 yen, Jan. – Jun., 2017 1US$ = 16.39 yen
*4 Exchange rates: Jan. – Jun., 2016 1€ = 124.62 yen, Jan. – Jun., 2017 1€ = 121.64 yen
*5 Net income of US subsidiaries (consolidated) is after excluding minority interests.
*6 Net Sales and net income of Harmonic Drive AG are non-consolidated.

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1st-half non-consolidated results

(millions of yen)

	1st-half FY ended Mar.31,2017		1st-half FY ending Mar.31,2018		Year-on-year change	
	Amount	Percent(%)	Amount	Percent(%)	Change	Rate(%)
Net sales	12,843	100.0	17,934	100.0	5,091	39.7
Gross profit	5,365	41.8	7,659	42.7	2,294	42.8
Operating income	3,180	24.8	5,135	28.6	1,954	61.5
Ordinary income	3,521	27.4	5,243	29.2	1,721	48.9
Net income	2,486	19.4	3,628	20.2	1,141	45.9
EPS（yen）	27.15		39.61		12.46	45.9
Capital investment *1	1,418		2,077		658	46.4
Depreciation costs	526		708		182	34.7
R&D costs	657		674		17	2.7

*1 Capital investment amounts are the amounts of tangible and intangible fixed assets acquired in the term.

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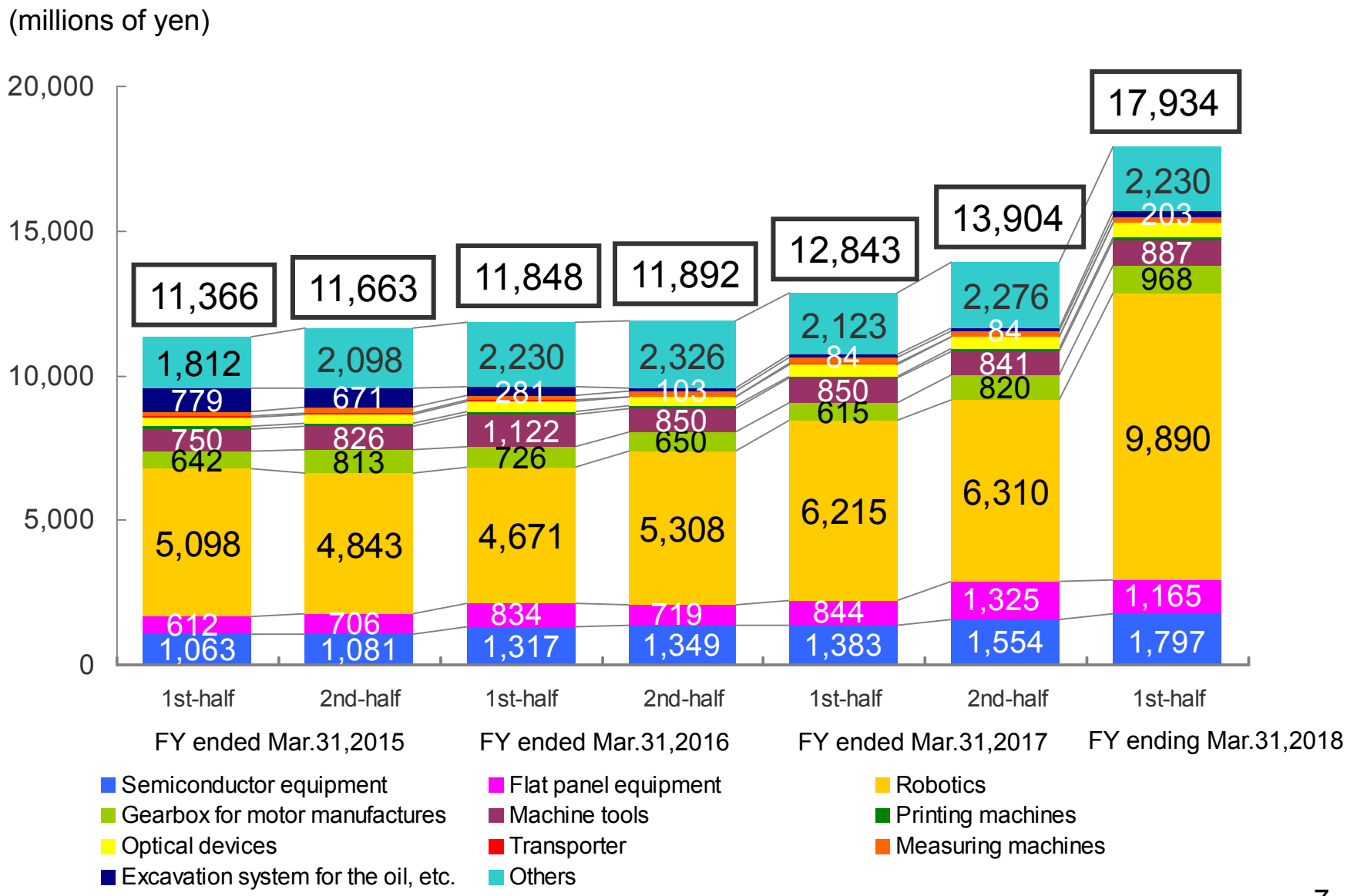
Net sales by application (non-consolidated)



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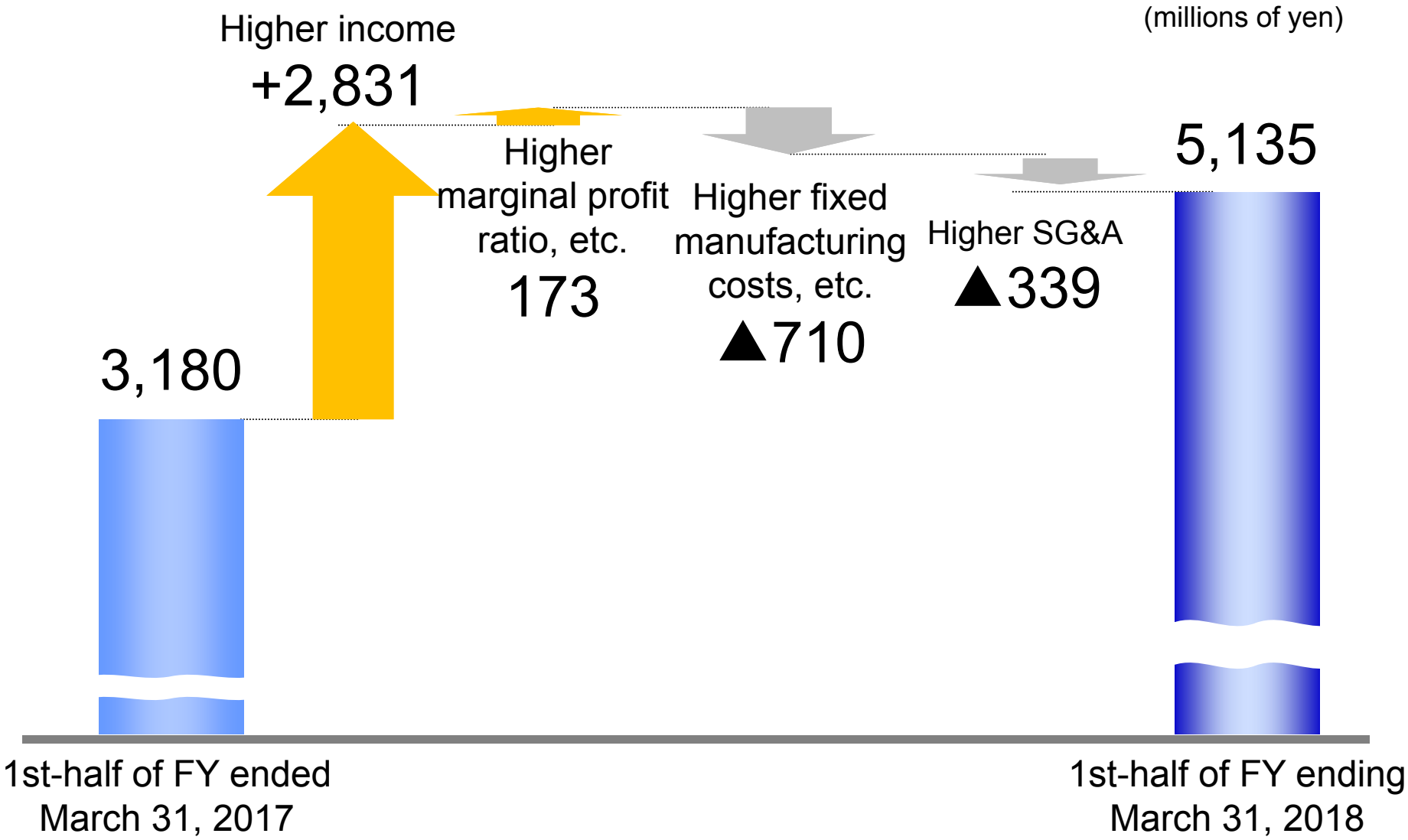
Factors in year-on-year change in 1st-half non-consolidated operating income



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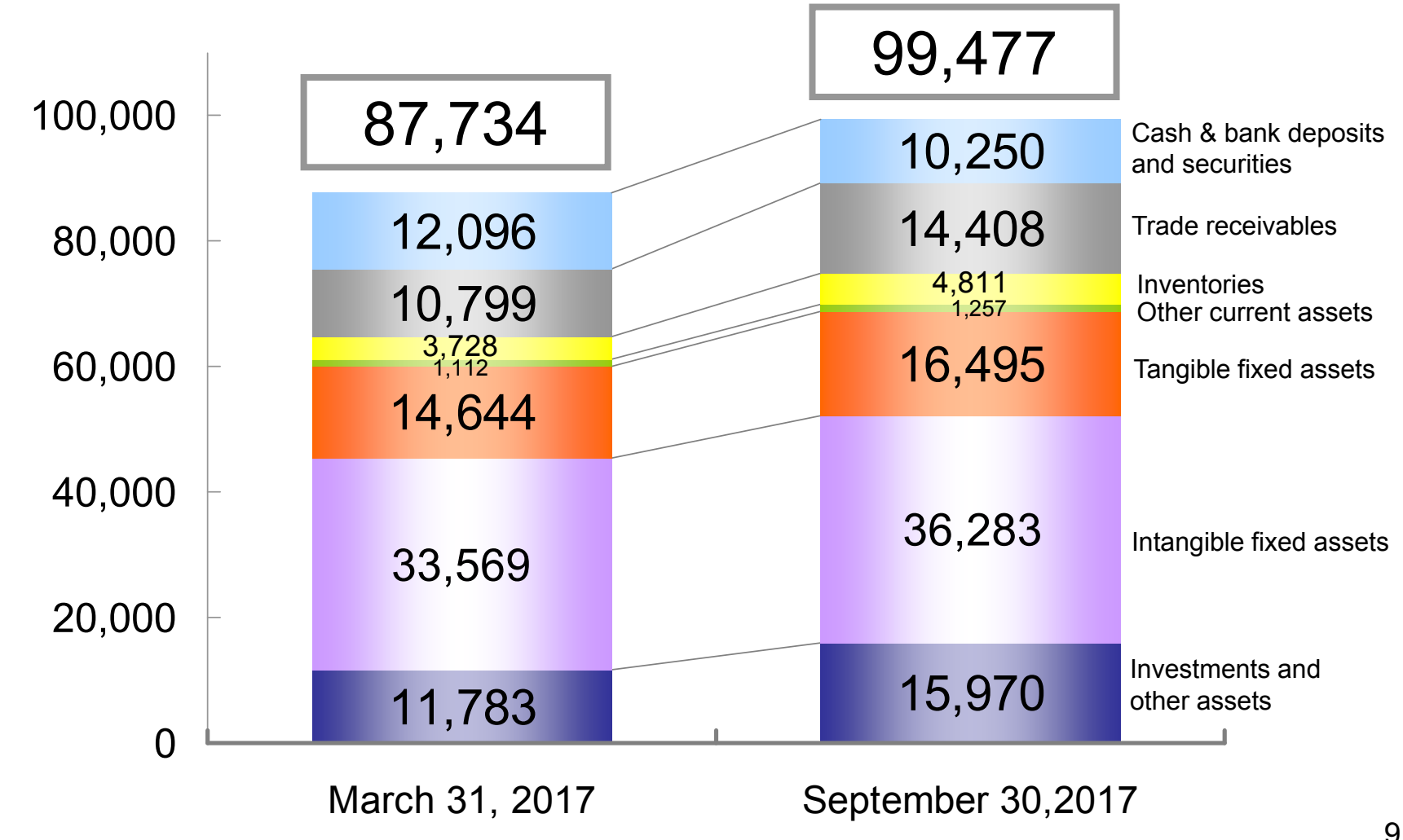
Status of consolidated assets



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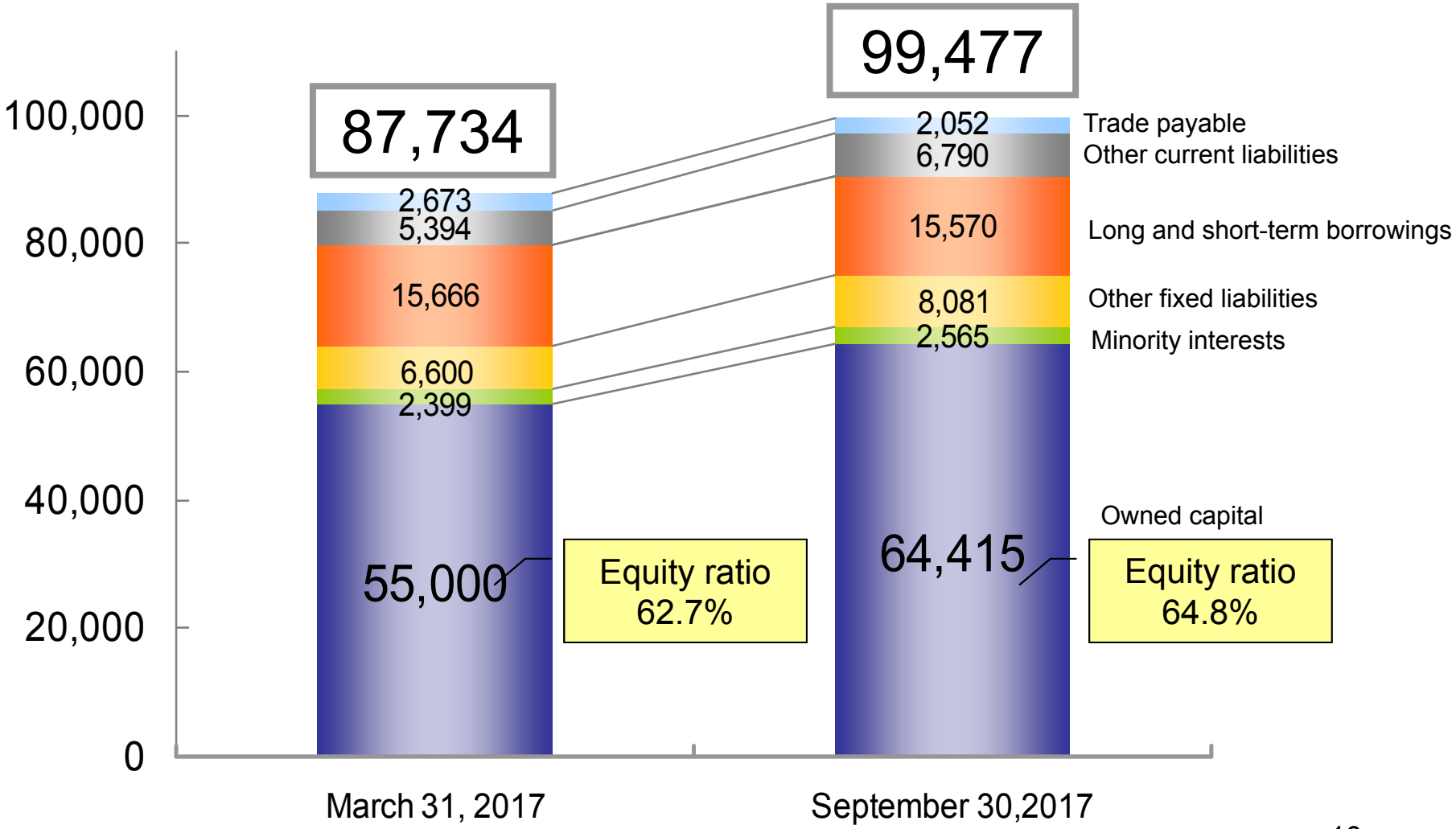
Status of consolidated liabilities and net assets



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Status of consolidated cash flows

(millions of yen)	1st-half of FY ended Mar.31,2017	1st-half of FY ending Mar.31,2018
Cash flow from operating activities	3,382	1,480
Cash flow from investing activities	▲1,033	▲1,973
Cash flow from financing activities	▲991	▲1,037
Effect of exchange rate changes on cash and cash equivalents	▲400	▲35
Net increase (decrease) in cash and cash equivalents	957	▲1,566
Cash and cash equivalents at end of year	11,396	8,102

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Performance Forecast for Fiscal Year Ending March 31, 2018

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Revised consolidated results forecast for fiscal year ending March 31, 2018

(millions of yen)

	Original forecasts (announced May 12)		Revised forecasts (announced Nov. 9)		Vs. original forecasts	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate (%)
Net sales	49,500	100.0	53,000	100.0	3,500	7.1
Operating income	12,000	24.2	13,000	24.5	1,000	8.3
Ordinary income	12,000	24.2	12,800	24.2	800	6.7
Net income *1	7,300	14.7	7,800	14.7	500	6.8

*1 Assumed exchange rate for FY18/3 forecasts 1USD ＝ ¥110.00 1EUR ＝ ¥125.00 1CNY ＝ ¥16.00
*2 Net income refers to net income attributable to owners of parent.

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Revised non-consolidated results forecast for fiscal year ending March 31, 2018

(millions of yen)

	Original forecasts (announced May 12)		Revised forecasts (announced Nov. 9)		Vs. original forecasts	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate (%)
Net sales	36,000	100.0	38,000	100.0	2,000	5.6
Operating income	9,300	25.8	10,400	27.4	1,100	11.8
Ordinary income	9,300	25.8	10,500	27.6	1,200	12.9
Net income	6,500	18.1	7,300	19.2	800	12.3

※Assumed exchange rate for FY18/3 forecasts 1USD ＝ ¥110.00 1EUR ＝ ¥125.00 1CNY ＝ ¥16.00

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Consolidated performance forecast for fiscal year ending March 31, 2018

(millions of yen)

	FY ended Mar. 31, 2017		Forecasts FY ending Mar. 31, 2018		Year-on-year change	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate (%)
Net sales	30,069	100.0	53,000	100.0	22,930	76.3
Operating income	7,813	26.0	13,000	24.5	5,186	66.4
Ordinary income	7,958	26.5	12,800	24.2	4,841	60.8
Net income *1	19,732	65.6	7,800	14.7	▲11,932	▲60.5
EPS（yen）	215.42	–	85.16	–	▲130.27	▲60.5
Capital investment	4,576	–	9,500	–	4,923	107.6
Depreciation costs	1,774	–	2,850	–	1,075	60.6
R&D costs	1,383	–	1,650	–	266	19.3

*1 Net income refers to net income attributable to owners of parent.
*2 Assumed exchange rate for FY ending Mar.31, 2018 forecasts 1US$ = ¥110.00 1€ = ¥125.00 1CNY=¥16.00

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Forecasts of main group companies for fiscal year ending March 31, 2018

(millions of yen)

		Equity stake	Net sales		Net income	
			Amount	Year-on-year change (%)	Amount	Year-on-year change (%)
	Harmonic Drive Systems Inc.	—	38,000	42.1	7,300	40.2
*2 *5	HD Systems, Inc. (Harmonic Drive L.L.C) (U.S.A)	100% (51%)	5,400	18.0	265	9.2
	Harmonic AD, Inc.	100%	2,700	13.6	200	40.8
*3	Harmonic Drive Systems (Shanghai) Co., Ltd.	100%	5,000	121.5	280	—
*4 *6	Harmonic Drive AG (Germany)	74.7%	13,700	34.2	2,250	111.4

Percent change(%) indicates increase or decrease from same period of previous fiscal year.

*1 For overseas subsidiaries and affiliates, the fiscal year ends December 31.
*2 Exchange rates: Jan. – Dec., 2016 1USD = 108.84 yen, Jan. – Dec., 2017 forecast 1USD = 110.00 yen
*3 Exchange rates: Jan. – Dec., 2016 1CHY = 16.37 yen, Jan. – Dec., 2017 forecast 1CYN = 16.00 yen
*4 Exchange rates: Jan. – Dec., 2016 1EUR = 120.33 yen, Jan. – Dec., 2017 forecast 1EUR = 125.00 yen
*5 Net income of US subsidiaries (consolidated) is after excluding minority interests.
*6 Net Sales and net income of Harmonic Drive AG are consolidated

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Non-Consolidated performance forecast for fiscal year ending March 31, 2018

(millions of yen)

	FY2017/3		FY2018/3 forecasts		Year-on-year change	
	Amount	Percent (%)	Amount	Percent (%)	Change	Rate (%)
Net sales	26,747	100.0	38,000	100.0	11,252	42.1
Operating income	6,568	24.6	10,400	27.4	3,831	58.3
Ordinary income	7,233	27.0	10,500	27.6	3,266	45.2
Net income	5,206	19.5	7,300	19.2	2,093	40.2
EPS (yen)	56.85	–	79.70	–	22.85	40.2
Capital investment	3,453	–	7,000	–	3,546	102.7
Depreciation costs	1,181	–	1,700	–	518	43.8
R&D costs	1,355	–	1,550	–	194	14.4

Assumed exchange rate for FY18/3 forecasts 1USD = ¥110.00 1EUR = ¥125.00 1CNY = ¥16.00

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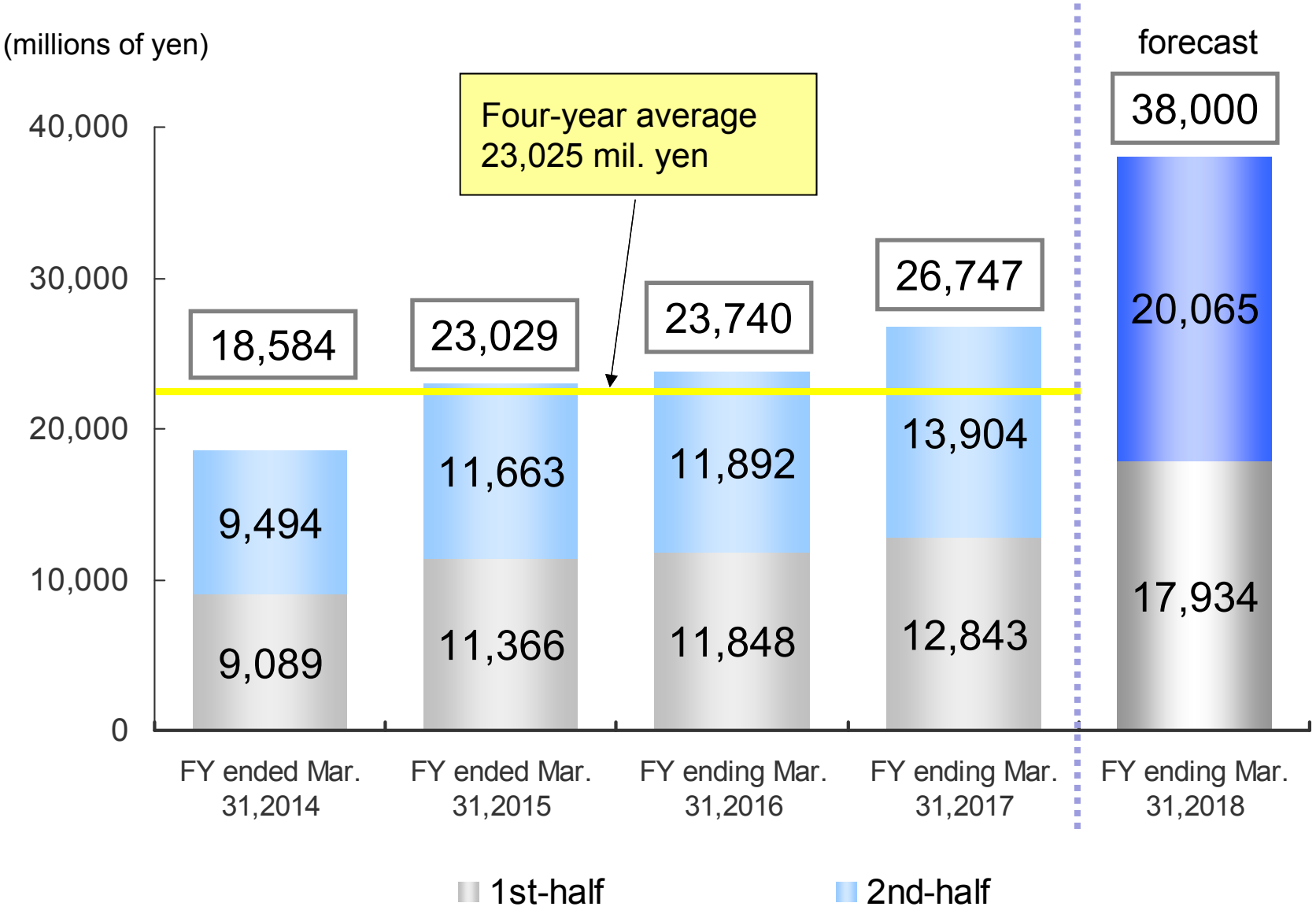
Sales trend line (non-consolidated)



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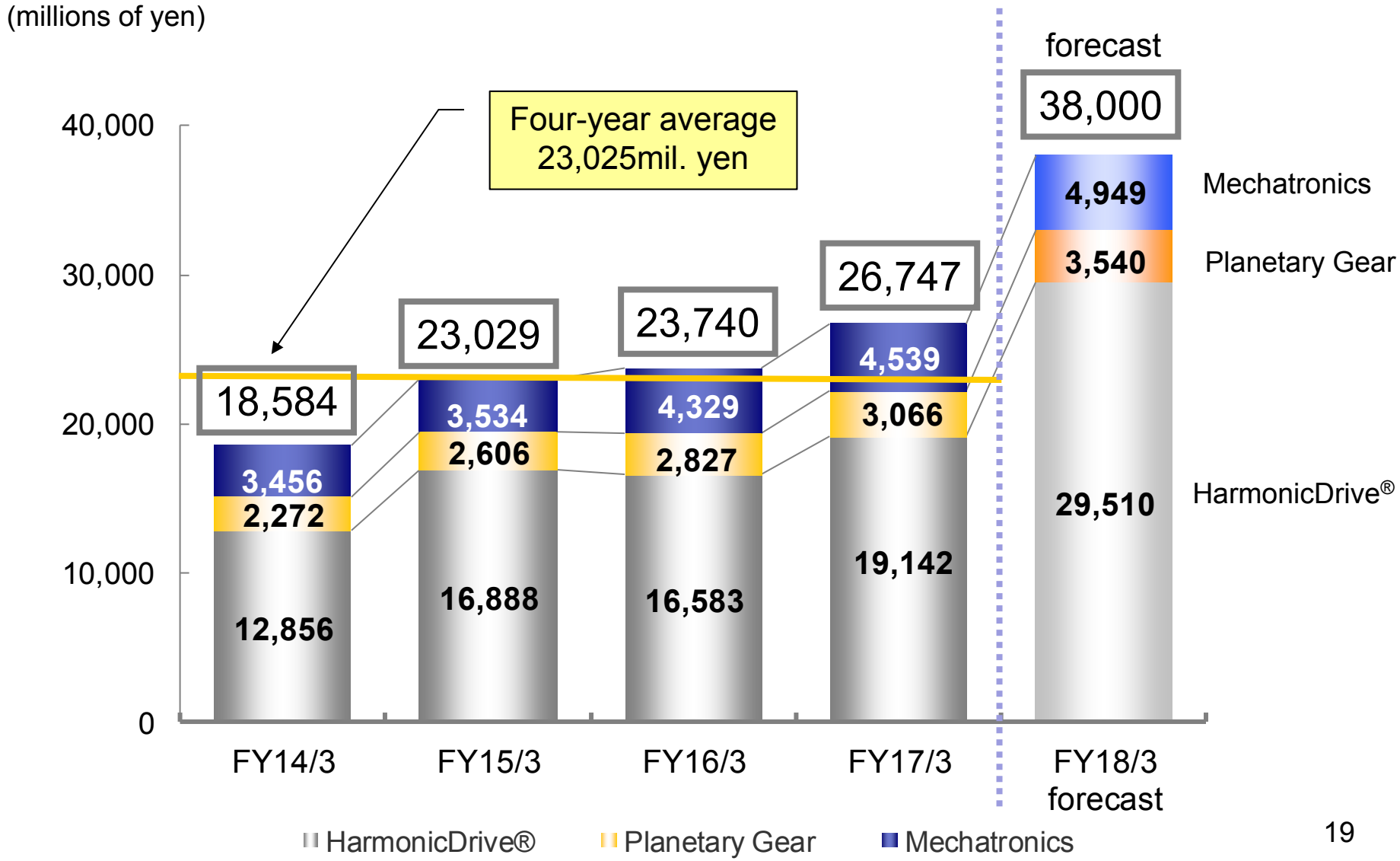
Sales trend line by product (non-consolidated)



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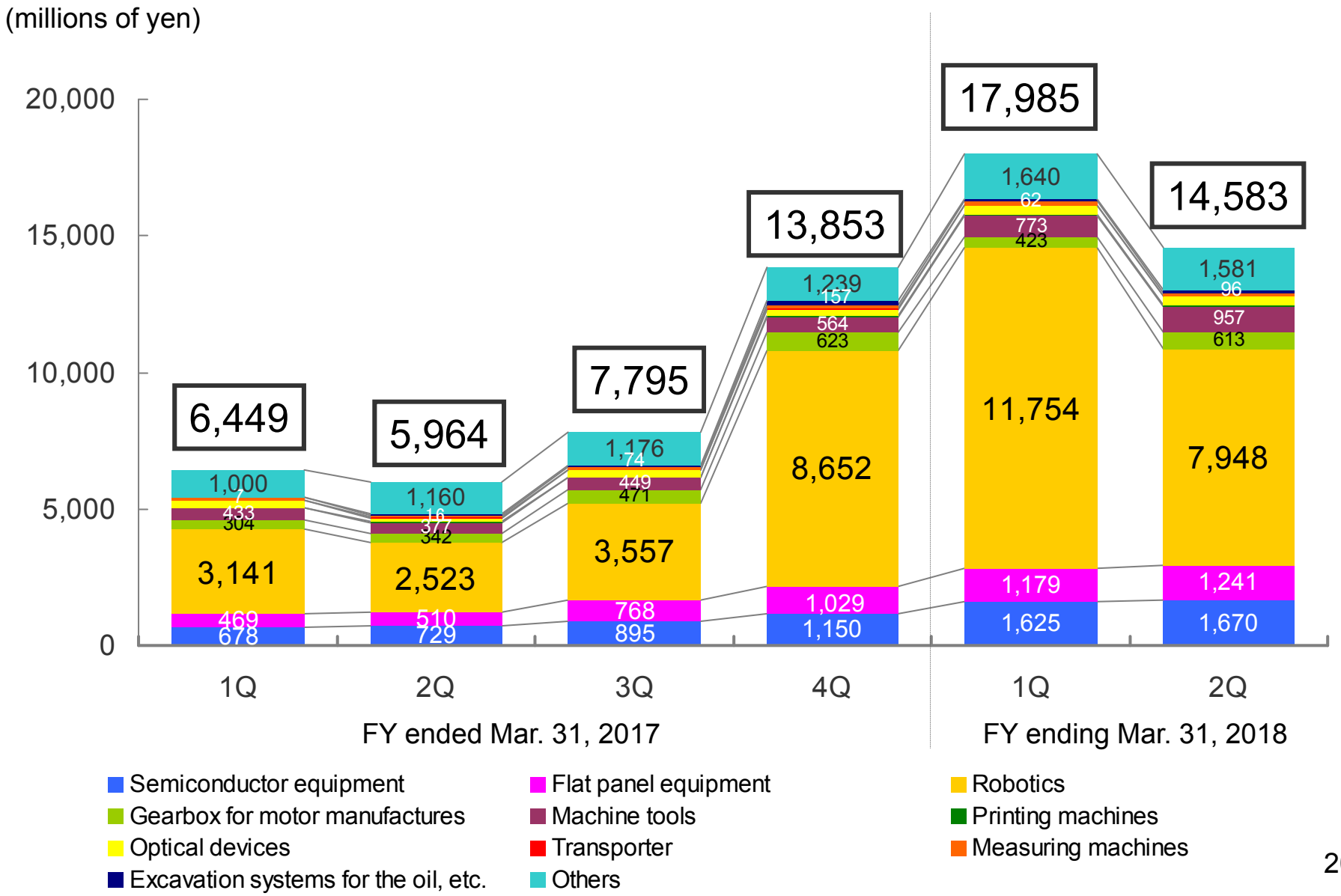
Non-consolidated bookings by application (quarterly)



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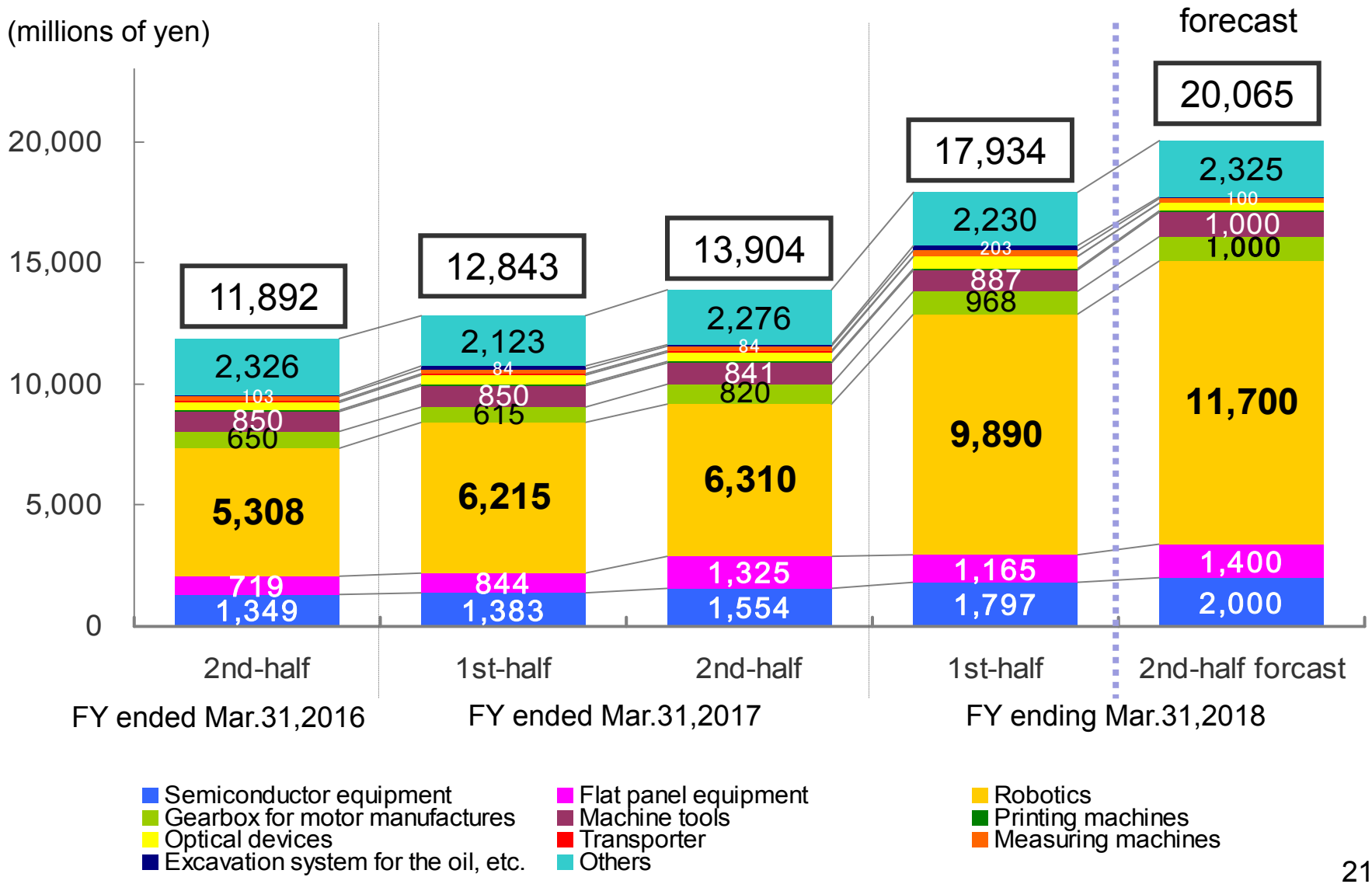
Non-consolidated net sales by application (premise for 2nd-half forecasts)



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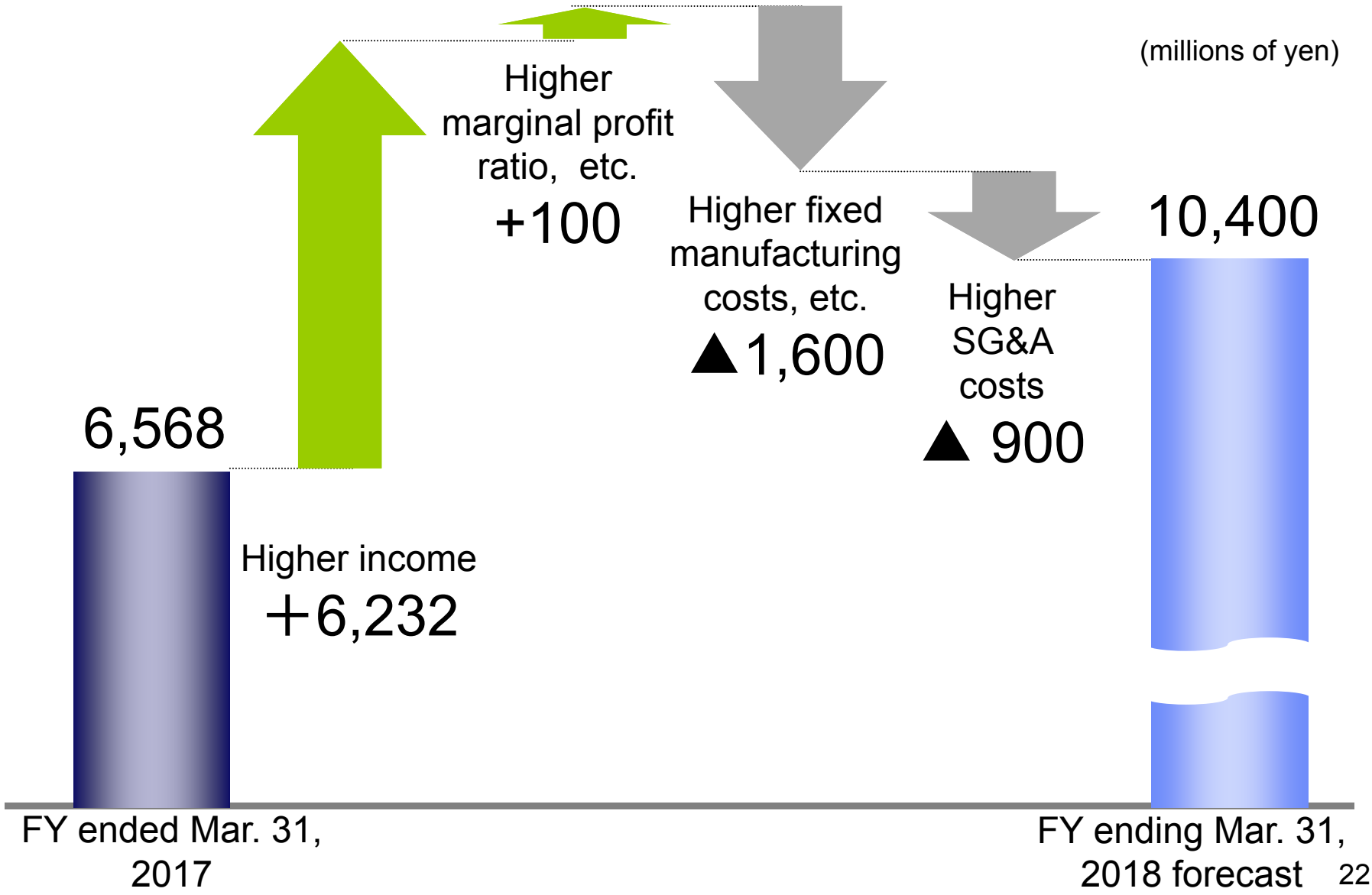
Factors in year-on-year change in non-consolidated operating income (fiscal year ending March 31, 2018 forecast)



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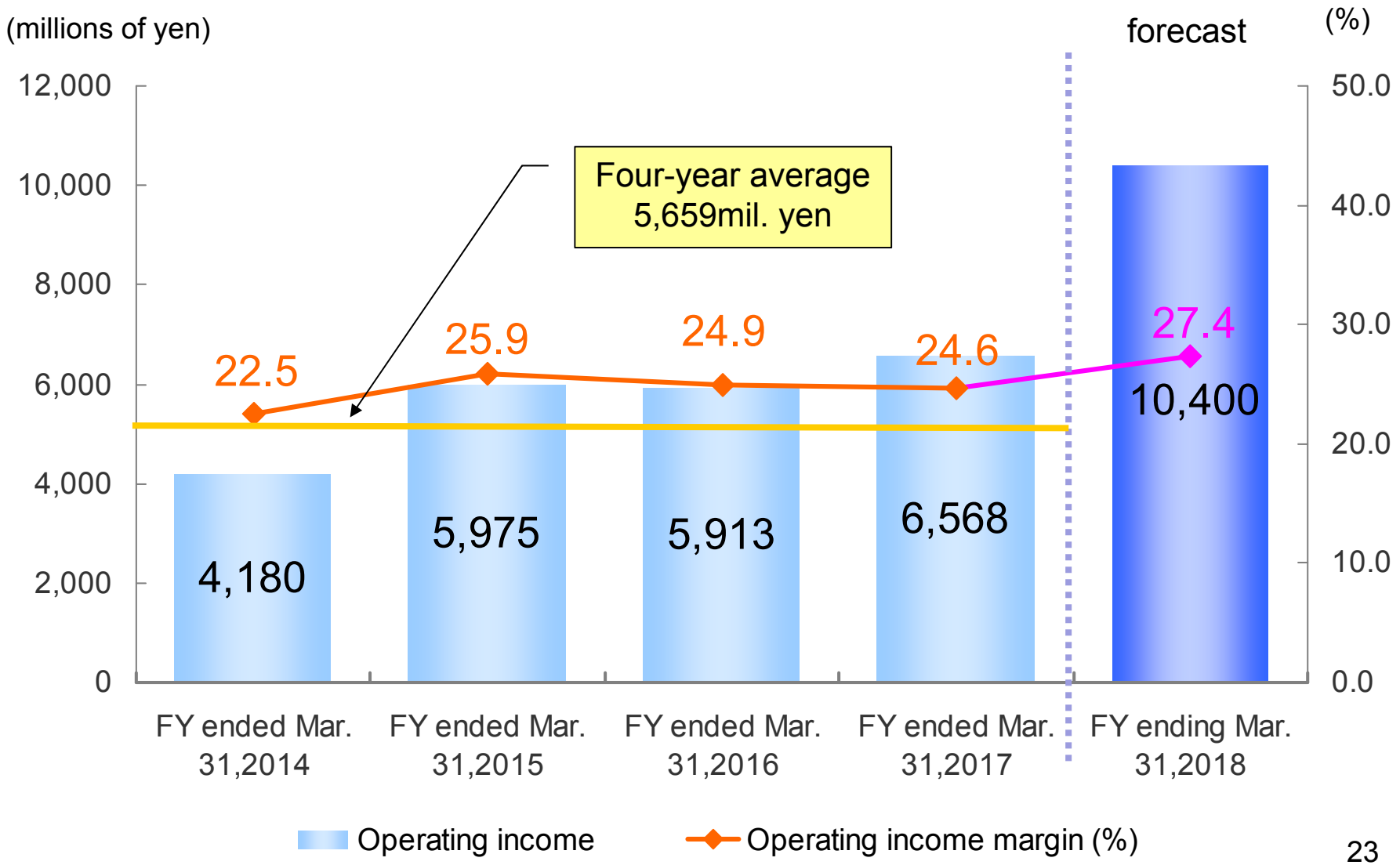
Trends in operating income (non-consolidated)



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Future Outlook

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6. Long-term vision
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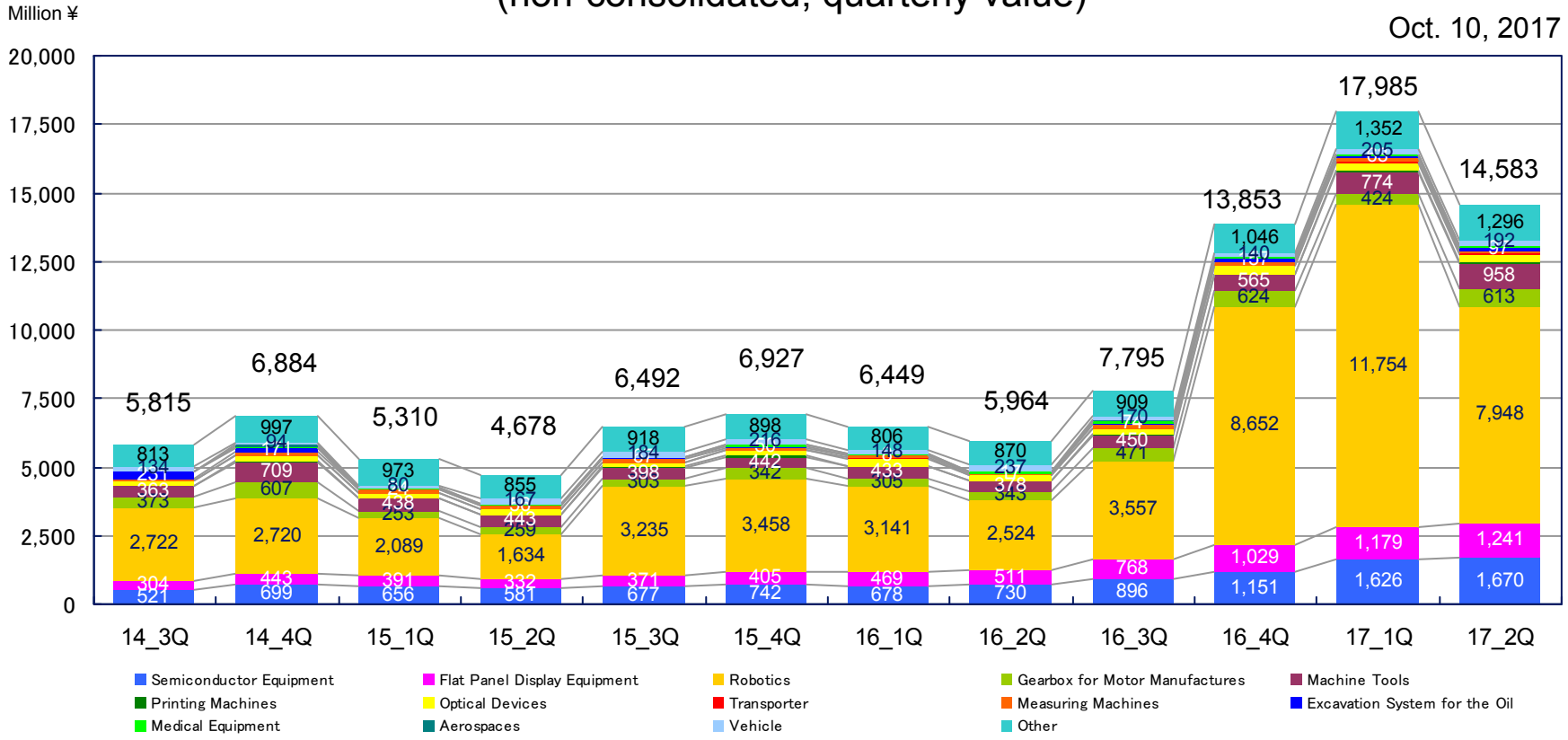
1. Recent orders trends

Rapid increase in orders from January 2017

Bookings by application
(non-consolidated; quarterly value)



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2. Market trends-①

Market for **industrial robots** to grow 15% annually from 2018

Source：IFR Report2017

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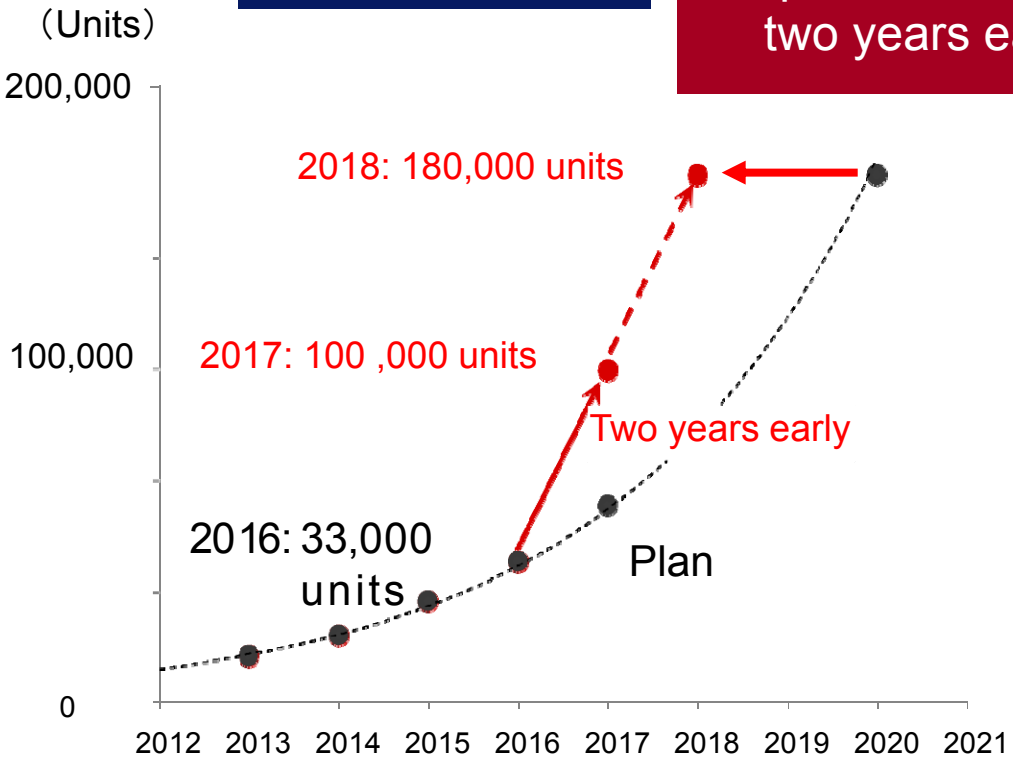
2. Market trends-②

Major robot makers: Demand forecast

Our products

Expected demand growth likely to materialize two years early, by 2018 rather than 2020



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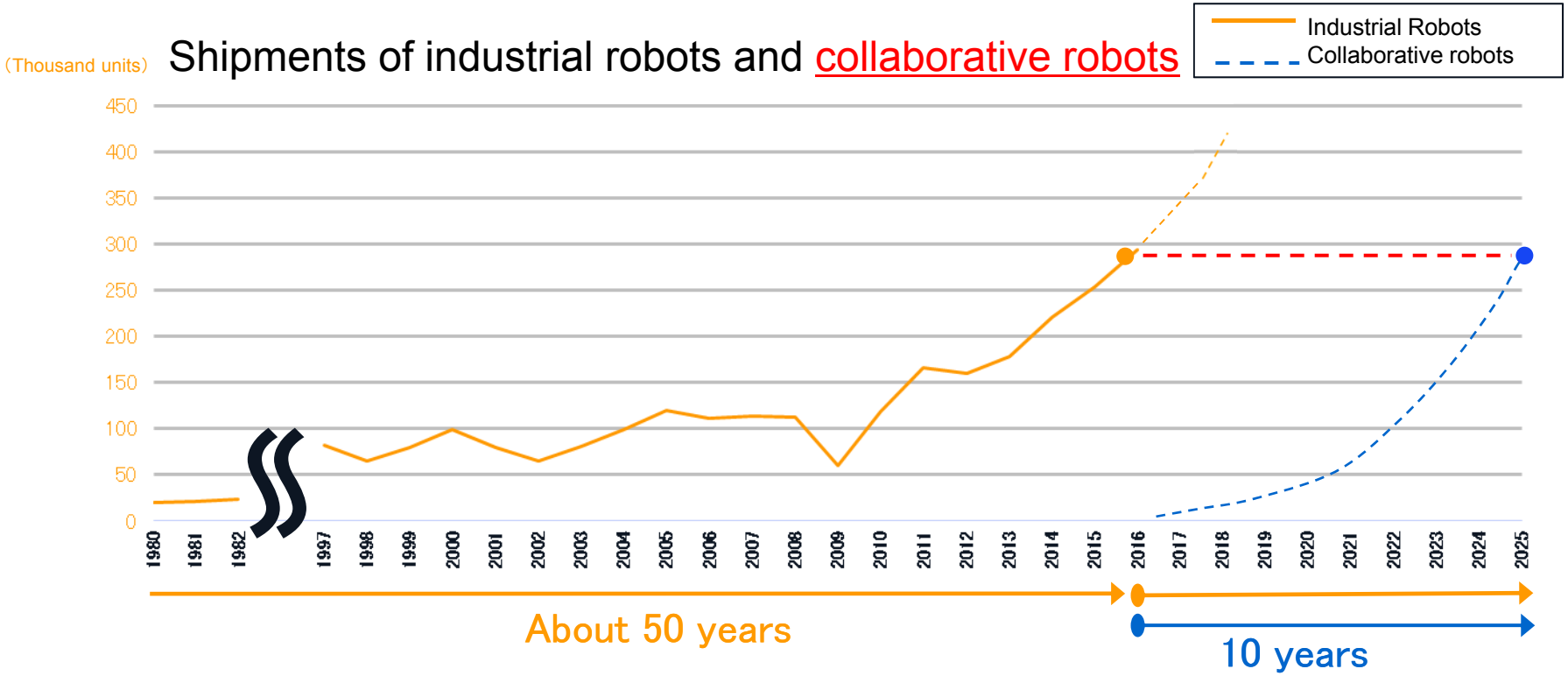
2. Market trends-③

Demand for collaborative robots to grow sharply by 2025



※HDSI, based on IFR Reports and, for the pre-1992 period, on Japan Robot Association data

Collaborative robots to grow as much in just ten years as industrial robots have in 50 years

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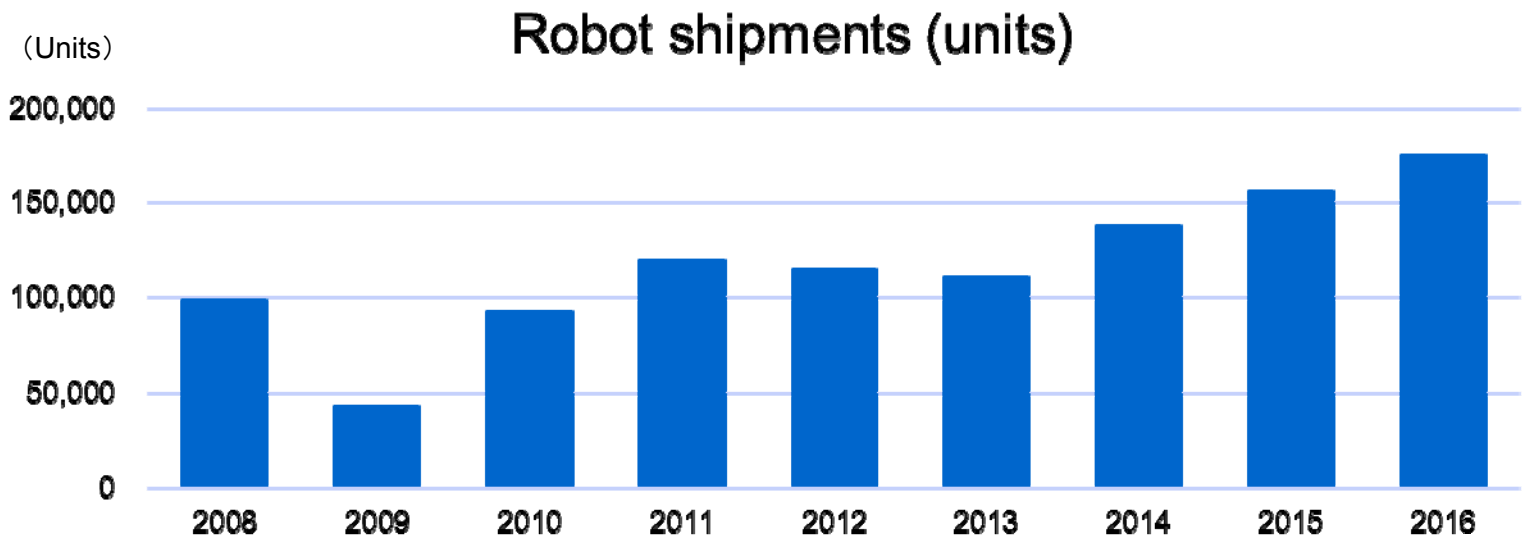
3. Important application trends-①
Industrial robots

■Growth in demand for smartphone production

■Growing worldwide demand for labor saving

⇨ Investment in new capacity at robot makers



Source: Japan Robot Association

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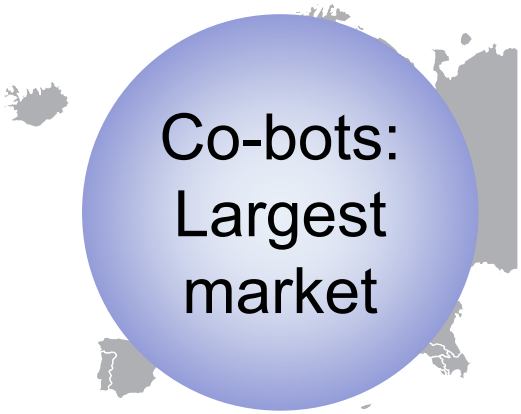
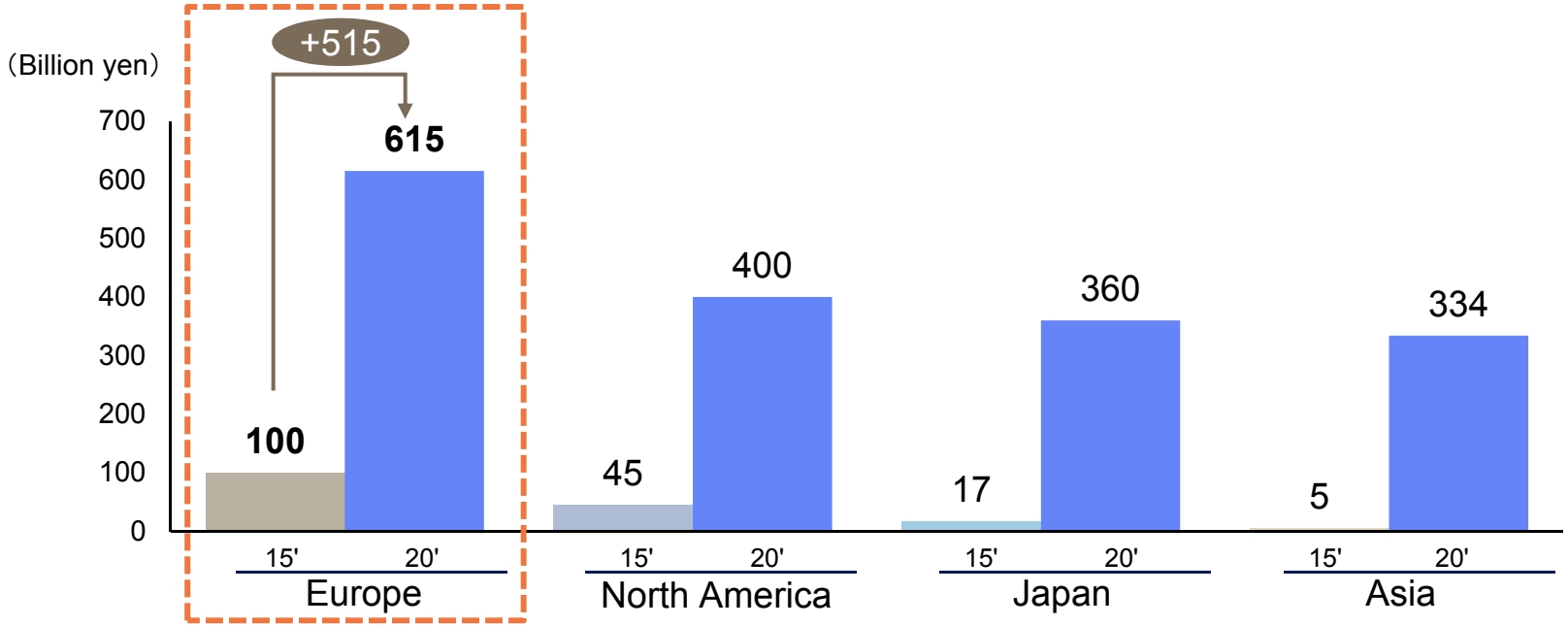
3. Important application trends-②
Collaborative robots



- Increasing use in manufacturing and in the service industries
- Set to fuel further growth

Co-bots: Market growth forecast



Source：Fuji Keizai "Worldwide Robot Market: Current Conditions and Future Outlook"

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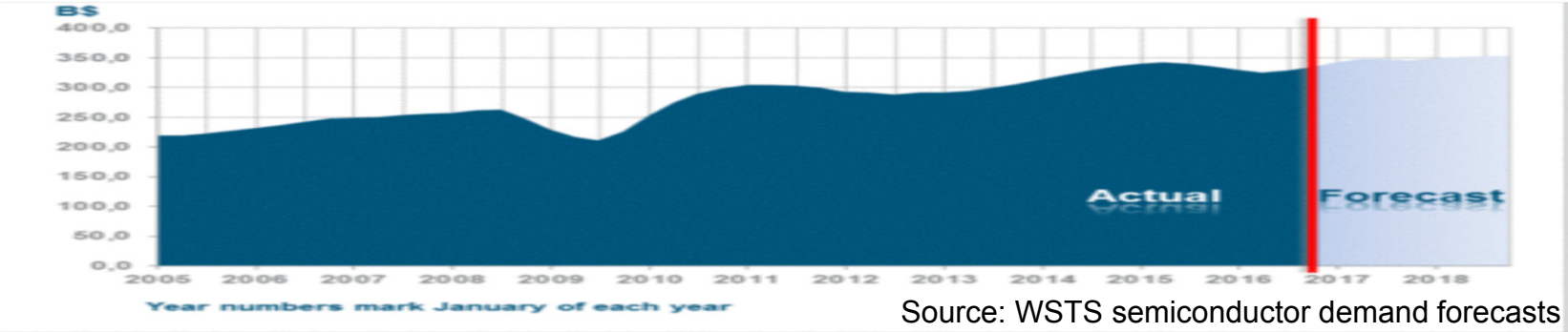
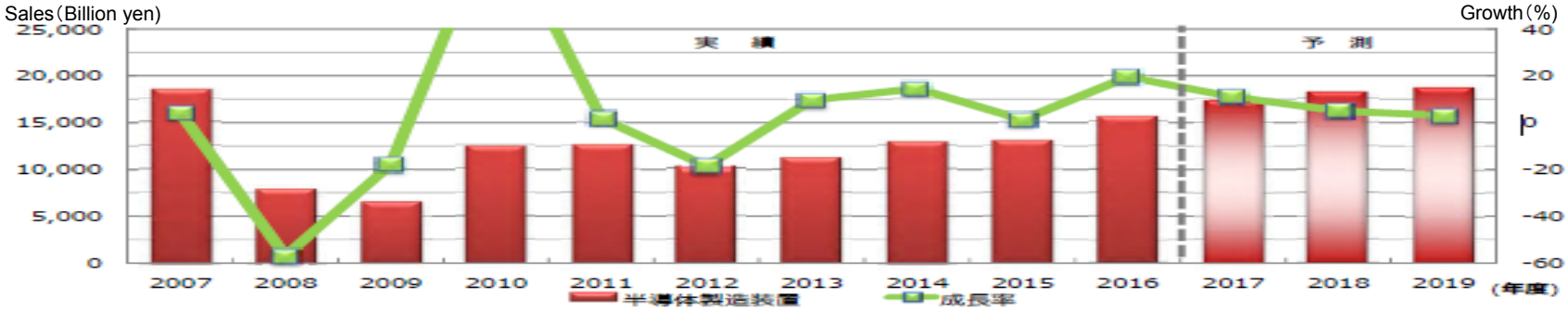
3. Important application trends-③
Semiconductor manufacturing equipment

- Higher capacities and quality upgrades have spurred investment in multilayer and miniaturization technologies
- Increased demand for semiconductors for artificial intelligence and virtual reality applications
- Investment in 5G-related technologies is beginning in earnest
- Increased server demand in response to the data explosion—shift from hard drives to solid state drives



Source: WSTS semiconductor demand forecasts



Source: Semiconductor Equipment Association of Japan projections

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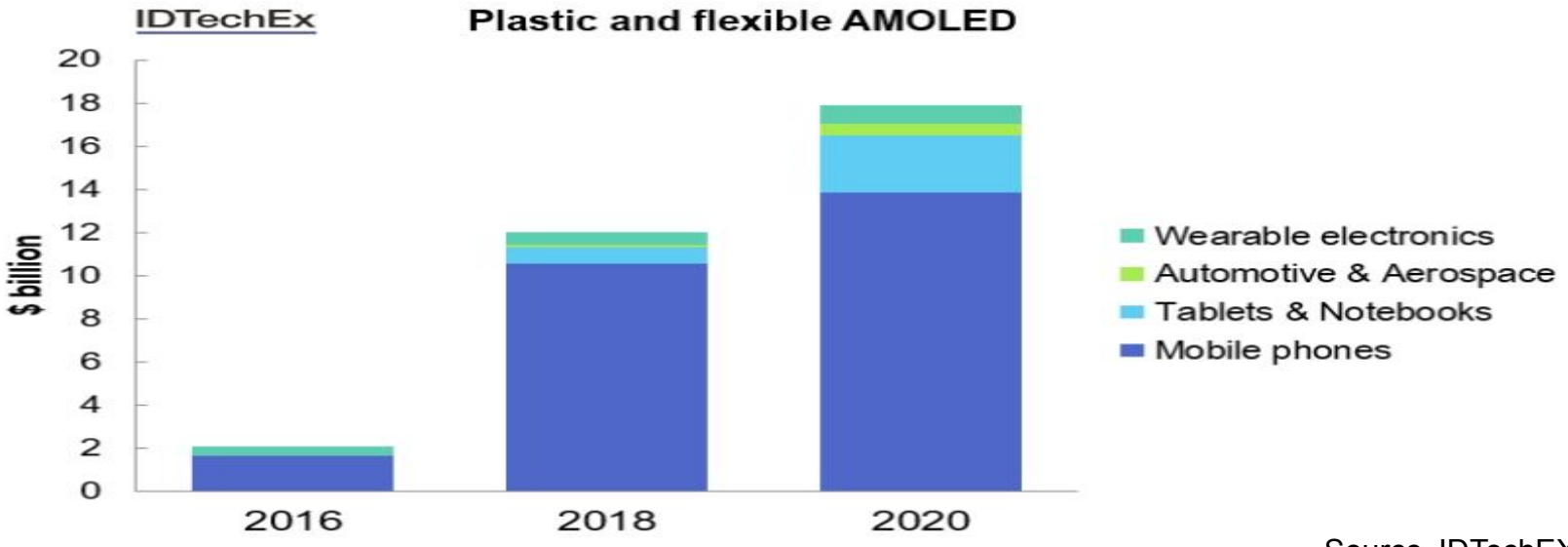
3. Important application trends-④
FPD/ OLED manufacturing equipment

■Latest smartphone models use OLED
■Major Chinese smartphone makers also using OLED panels in their latest models
■In addition to Major Japanese and South Korea panel makers, and Chinese companies are investing aggressively in OLED panel factories
■Japanese panel maker starting mass production using the printing method

OLED : Market forecast



Source：IDTechEX

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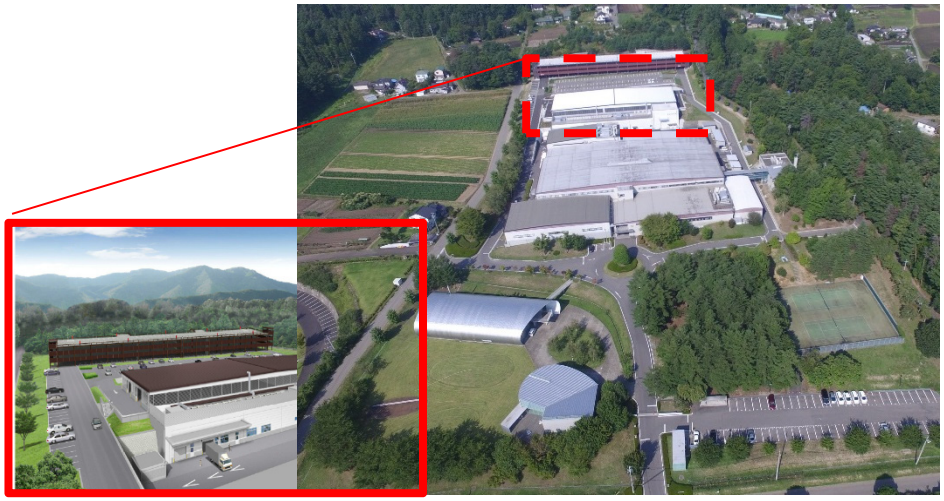
4. Capacity expansion-①

Expanding capacity for HarmonicDrive®; new land acquisition for expansion

- ■New lines at the first Hotaka factory
- ■Expansion of existing capacity (adding a second shift, boosting productivity)
- ■Land acquired for a second Hotaka factory, to become a production base of the same stature as the No. 1 factory

The Hotaka No.1 Factory (Azumino City, Nagano)	Factory land area about 20,000 *tsubo*



- New line equipment investment: ¥1.5bn
- Production increase from March 2017
- （to 85,000 units/month, from 50,000 units/month）

The Hotaka No.2 Factory (Azumino City, Nagano)	Factory land area about 15,000 *tsubo*

Source: Google Earth

- Incremental investment
- Output to rise to 100,000/month by March 2021

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4. Capacity expansion-②

Main component（cross roller bearing）capacity expansion, new factory construction

New factory—artist's conception
(Matsumoto City, Nagano)

- Construction of new factory structures to start in December 2017
- Cross roller bearing monthly capacity to rise to 150,000 units by March 2023

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4. Capacity expansion-③
HDLLC／HDAG: Proposed factory site

【HDLLC】
Plans to buy a factory site near Beverly, MA
（New plant conceptualization）

【HDAG】
Expansion possible next to the existing plant

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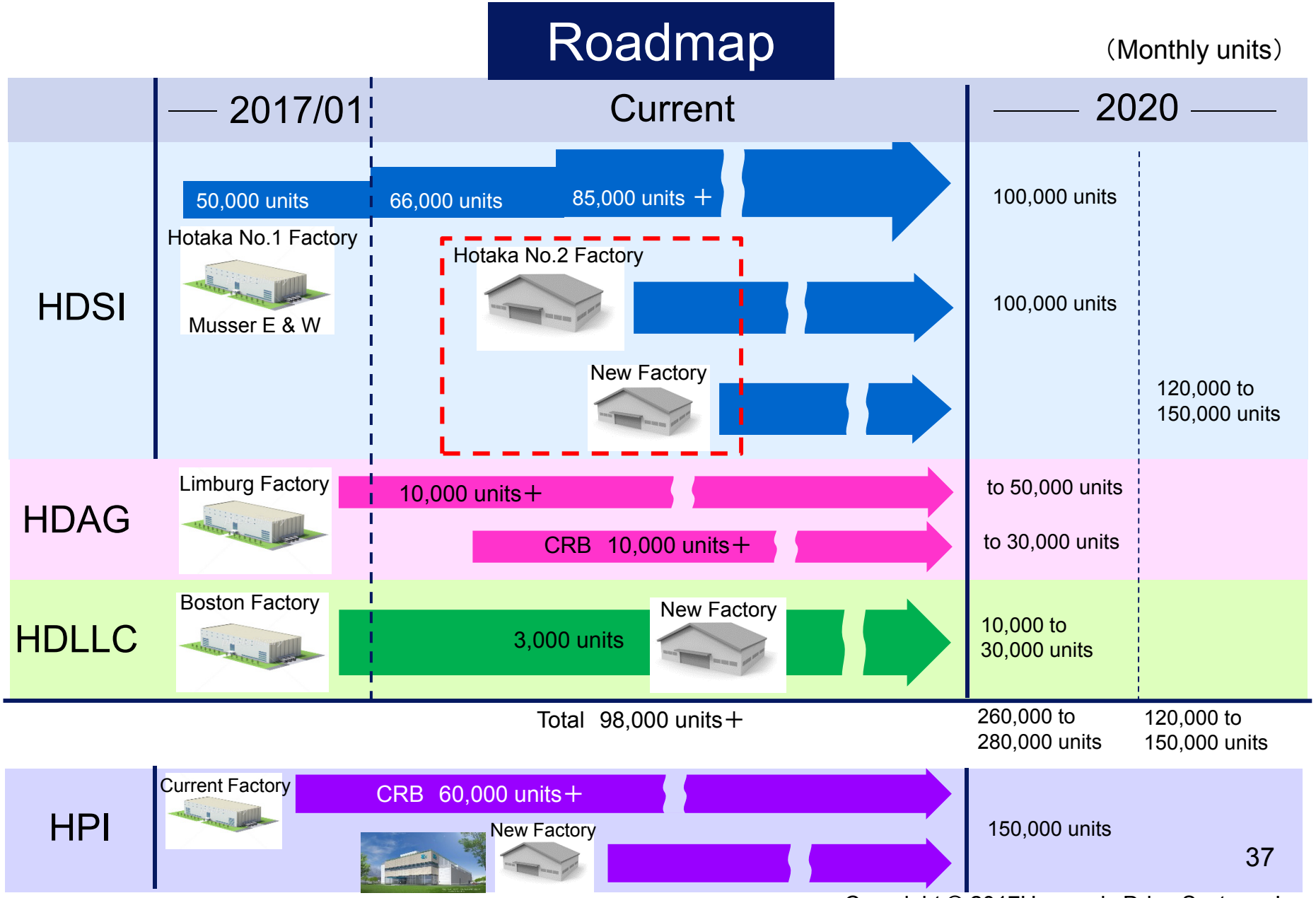
4. Capacity expansion-④



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5. Expected issues have materialized

◇ Expand production capacity

⇐ **The second Hotaka plant**

◆ Don't count on current record high sales – it's short term.
Be aware there always involves a certain fluctuating factors – in SEMI, FPD/OLED even Industrial Robot as well.

◆ Serious competition has developed

⇐ **Competitors have moved into Nagano**

⇐ **A surge among Chinese manufacturers**

◆ Can not depend solely on long term relationship based upon mutual trust built on our experiences and QCDS.

◆ Can these risks be absorbed simply through scale expansion?

◇ Continuous effort to diversify applications (medical equipment, food industry, pharmaceuticals etc.)
Diligent work in R&D; New gear mechanism, New Materials, New production method

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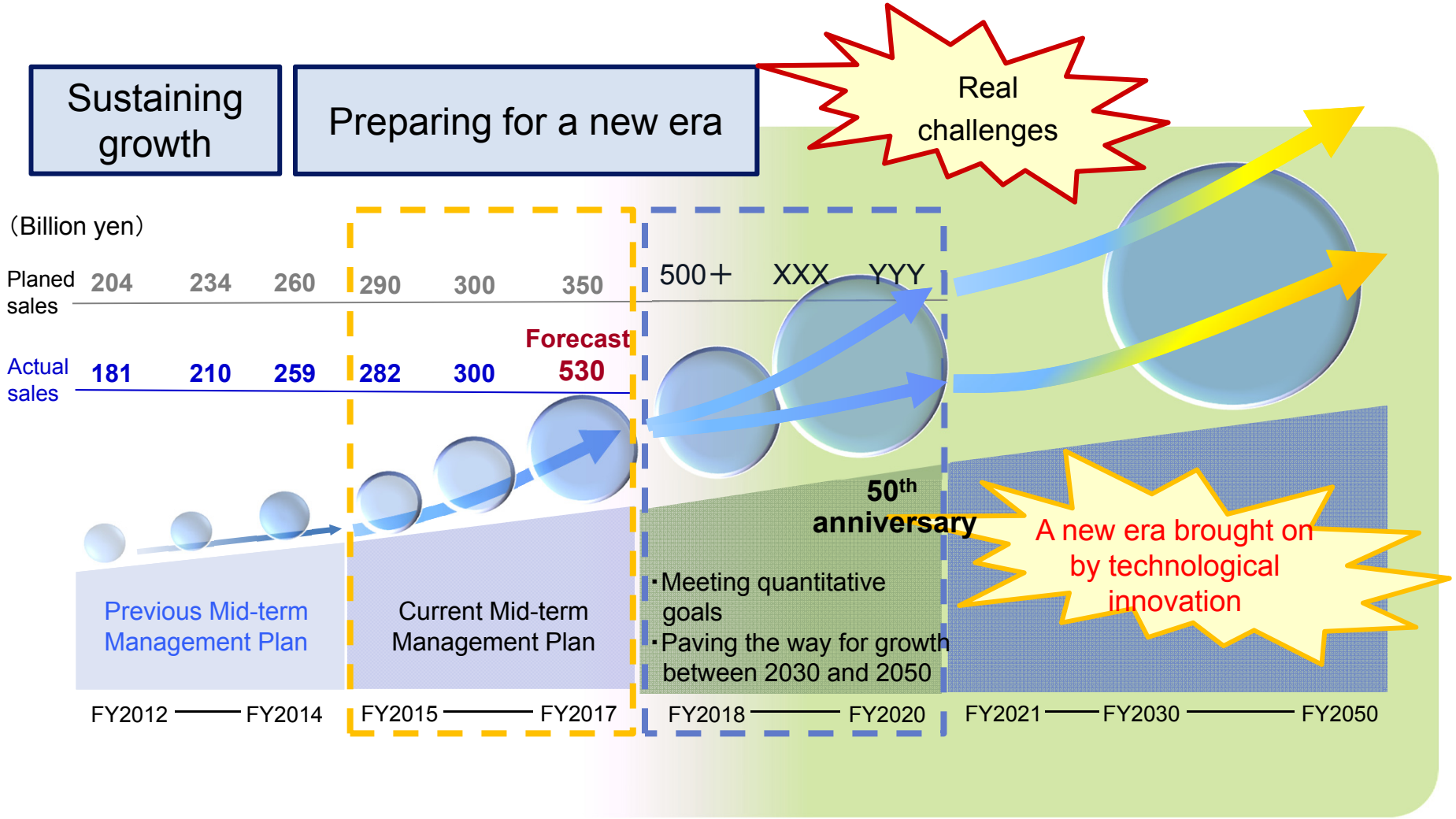
6. Long-term vision
（the next medium-term business plan）



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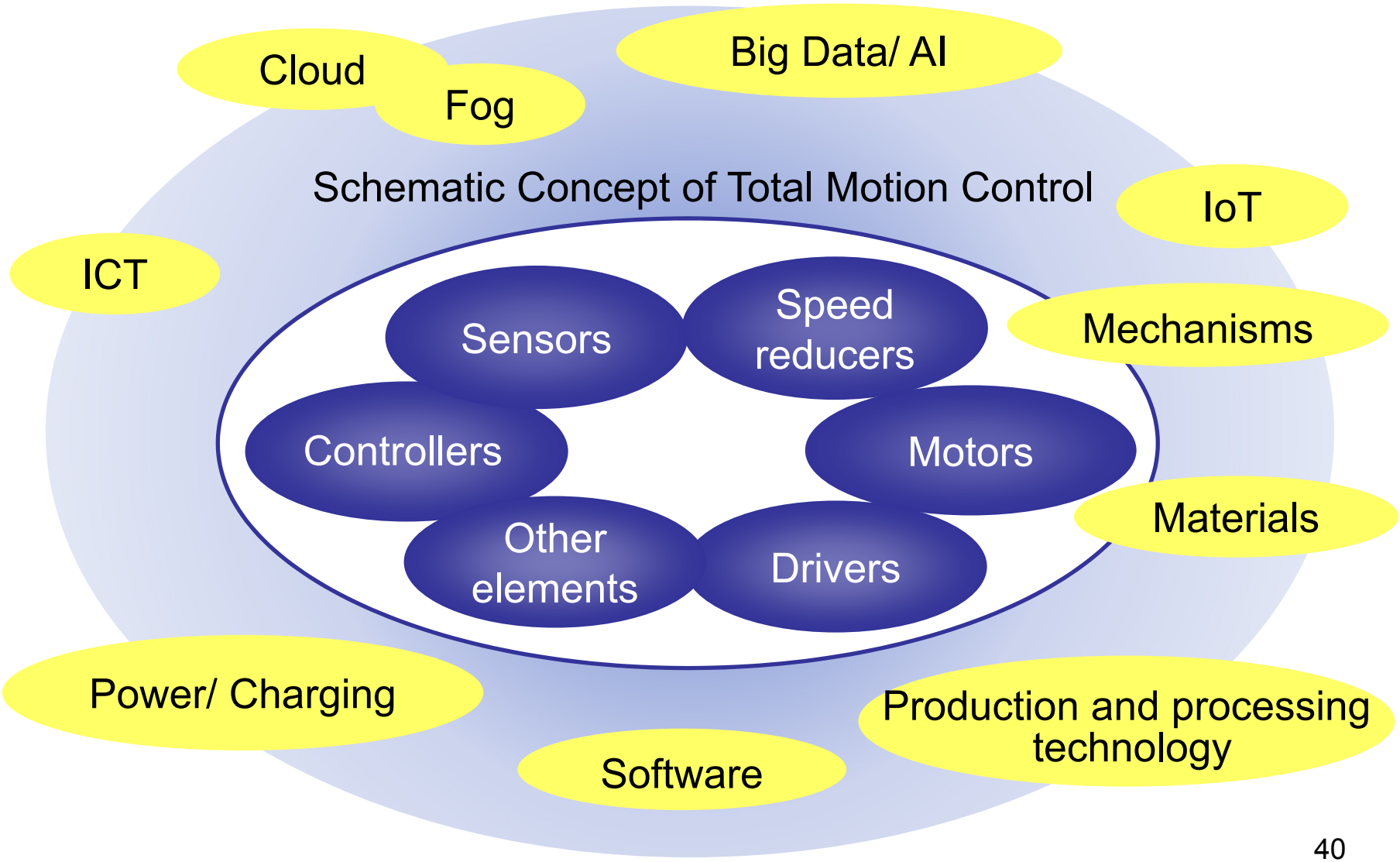
7. Changes in the business environment



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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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