

An abstract graphic consisting of several overlapping, flowing blue lines that swirl around the central text, creating a sense of motion and depth.

Future Outlook

The background features several decorative, hand-drawn style blue swirls and loops that frame the central text.

Orders by Region

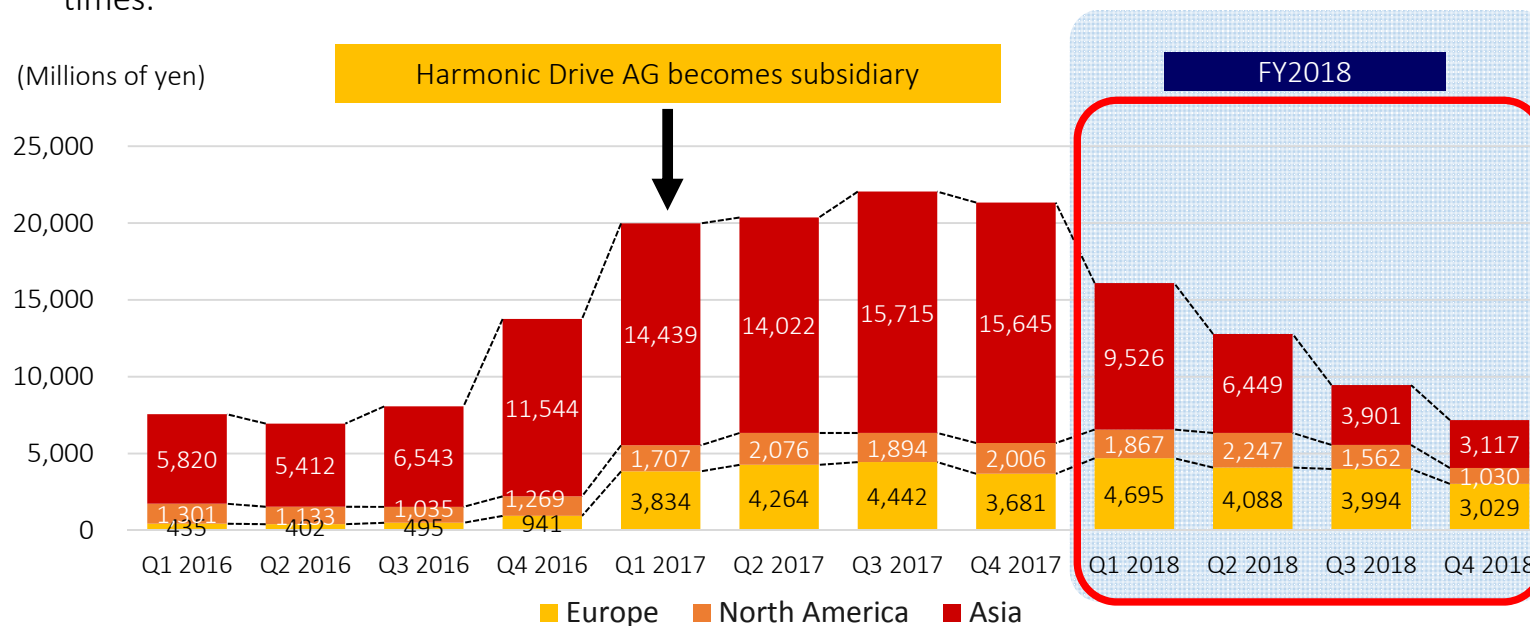
Consolidated orders, by region

External environment

- Slowdown of market growth in China, affected by US-China trade friction and fiscal reforms
→ Recently, some signs of recovery in the Chinese market.
- “Overheating of investments” in industrial robots in 2017-18 now undergoing correction.
→ Overall orders are now in a downtrend (according to Japan Robot Association).
- “Advance orders” we received in previous years have led to inventory adjustments.
→ Distributors and customers alike are adjusting inventories (but cancellations and requests for delayed deliveries have recently toned down).

Internal environment

- Customers are still satisfied with our products and services; customer relations are solid.
- By increasing our production capacity, we have worked through order backlogs and normalized lead times.



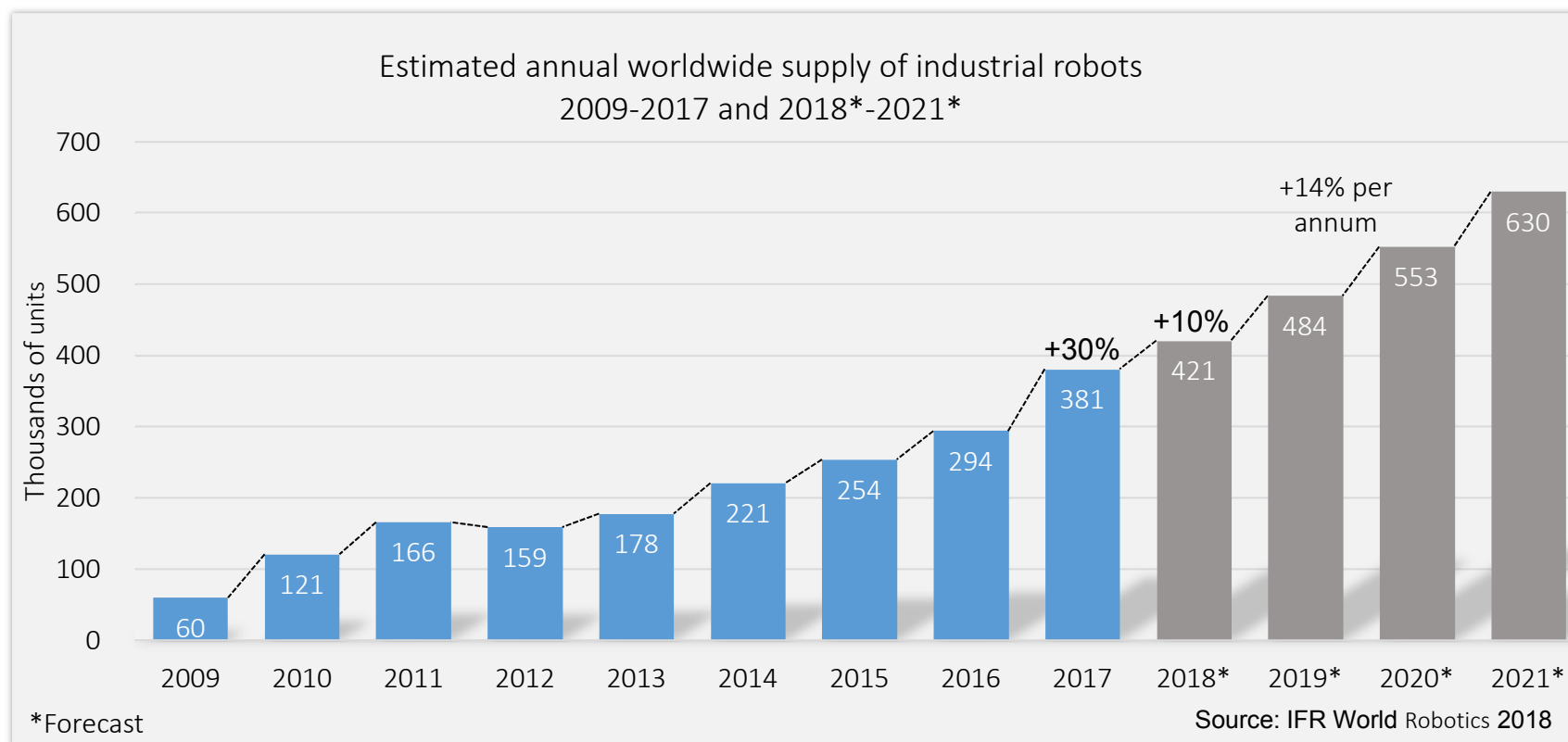


Trends in Main Fields of Application

1. Industrial robots

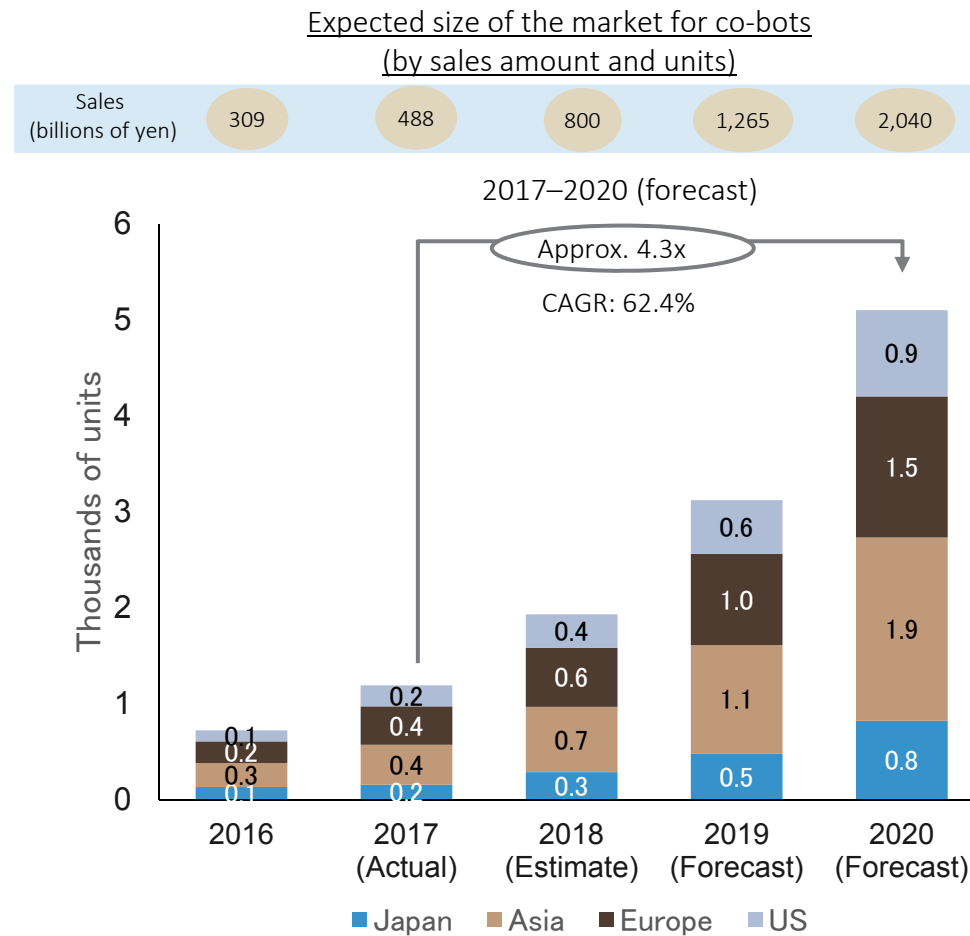
- Chinese manufacturers are holding back capex plans, cautious of the market slowdown.
- But some nascent signs of a recovery in the Chinese market are appearing.
- Meanwhile, investment appetite for labor-saving and automation remain strong.

Worldwide outlook for number of industrial robots sold



2. Collaborative robots (co-bots)

- Expanding adoption in the manufacturing and service sectors
- Robust demand, centered on Europe



Source: Techman Robot Inc.

Source: "Reality and Future Outlook of Worldwide Robot Related Market 2018; Vol.1 FA Robot Market Edition," Fuji Keizai Group

3. Semiconductor manufacturing equipment, LED and OLED manufacturing equipment

Semiconductor manufacturing equipment

- Growth in the smartphone market is decelerating.
- Capex has been curbed at a major US information technology firm, resulting in a decrease in memory demand.
- But demand is solid for AI, VR, and CASE (automobile-related).
- We also expect demand to be fueled by 5G-related investment.
(3G [voice]→4G [data]→5G [video])



LED and OLED manufacturing equipment

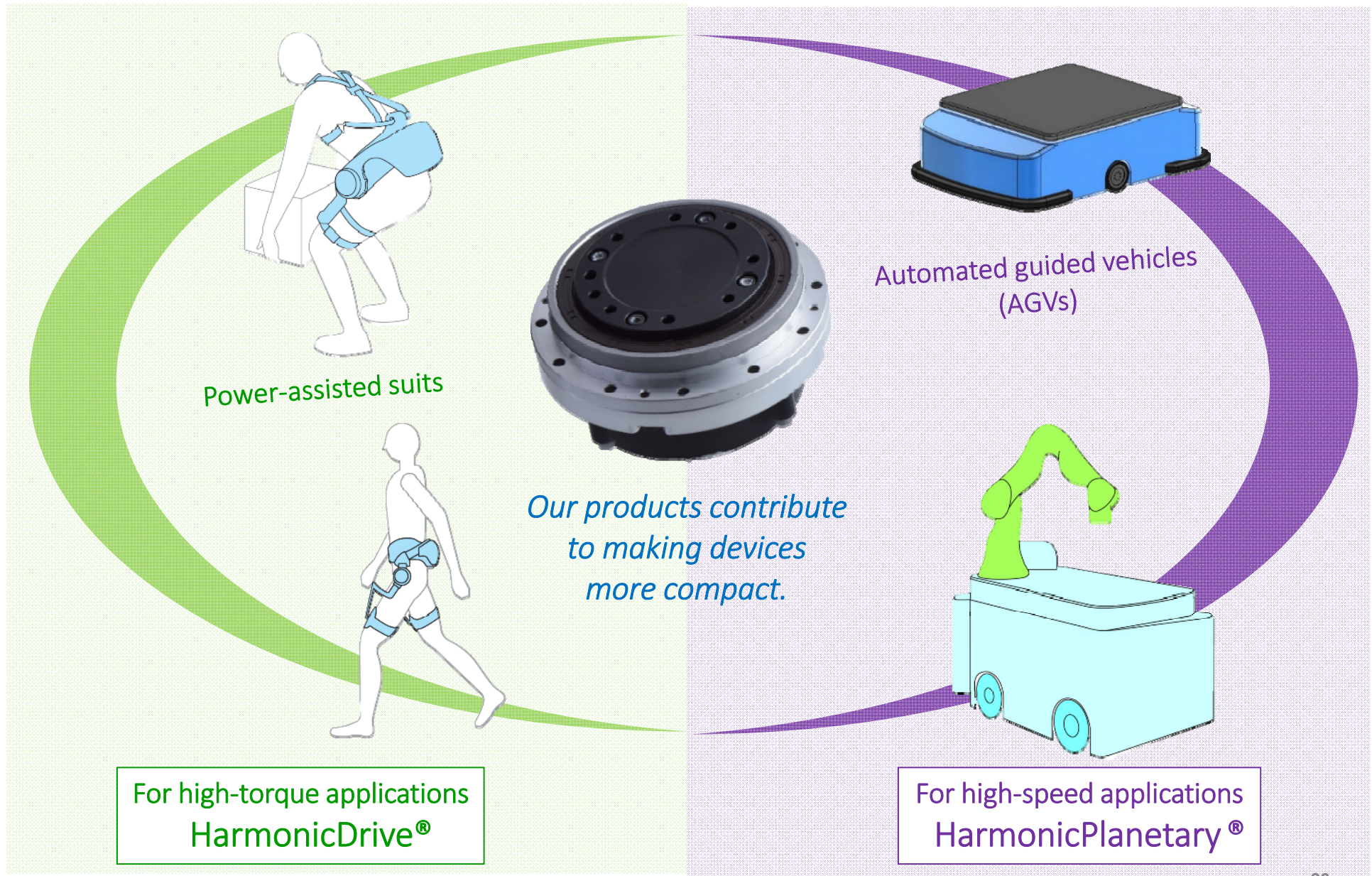
- Falling demand for small/medium-sized FPDs, as smartphone growth decelerates.
- But budding demand for OLEDs used in large TVs and onboard automotive electronics.



The background features several elegant, flowing blue lines that swirl around the central text, creating a sense of motion and design.

New Products and Applications

Power-assisted suits & AGVs



Power-assisted suits & AGVs

★ New product: FLA Series

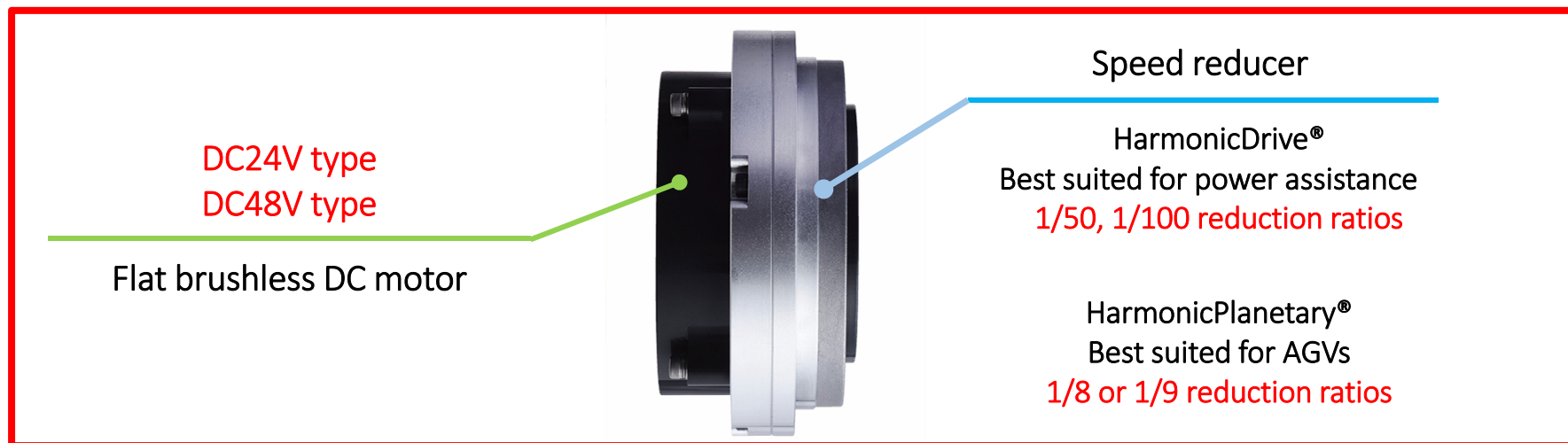
Our new actuator series is lighter and thinner than previous versions, allowing us to meet diverse user requirements.

- Specialized design realizes lighter weight and extreme flatness:

Lightest 390g Length 39.8mm <FLA-11A type>

- Extensive product lineup:

4 models × 3 reduction ratios × 2 voltages Various combinations



Power-assisted suits & AGVs

We aim to reach a broad customer base by offering products in collaboration with Yaskawa Electric Corporation.

Actuators



Harmonic Drive Systems

Drivers



Yaskawa Controls

➤ End users

FY2018 performance: Inquiries from 70 companies in Japan and overseas

Global sales expansion of MINI-MICRO series

Advanced medicine,
amusement



Table top robots



Source: Mecademic Inc.

www.mecademic.com

Small collaborative robots,
semiconductor manufacturing
equipment



Source: Techman Robot Inc.



Industry's smallest
Ø5mm



CSF micro series
Starting from Ø10mm



CSF mini series
Starting from □20mm



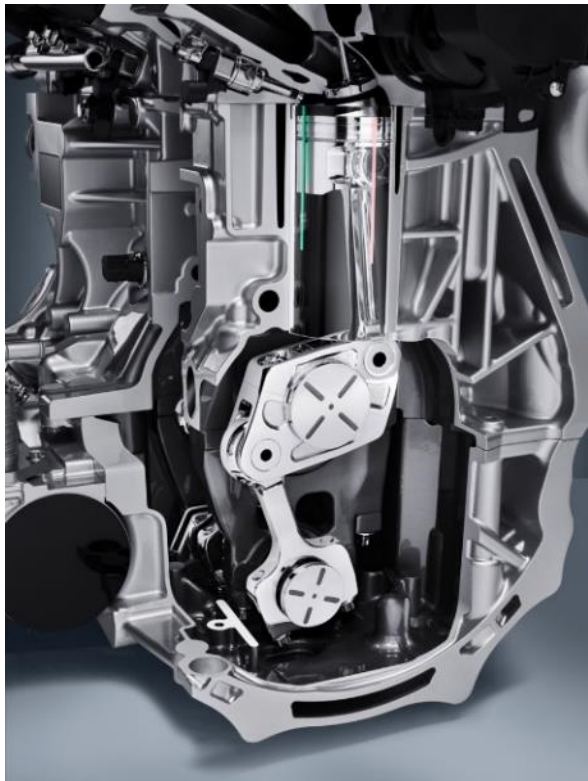
CSF-2UP series
Starting from □50mm

- Global sales expansion of our highly-competitive and unmatched products made possible through our Group's unique strengths.
- We look to establish our products as the "de facto standard" in the above-mentioned markets that are poised to grow further.

Helping to bring a revolutionary type of new engine into practical use

■ Nissan Motor Co., Ltd.

- Used in actuator for variable compression ratio (VCR) engine
- One HarmonicDrive® used in each engine



Source: Nissan Motor Co., Ltd.

Significantly improved fuel performance

- Compression ratio continuously changes according to driving conditions
- Significantly improved thermal efficiency
- Has been something of a dream among internal engine technologies, under development for more than 20 years



- ◆ Expected to drive next-generation technologies
State-of-the-art technology contributing to the fusion of internal combustion engines and electric vehicles

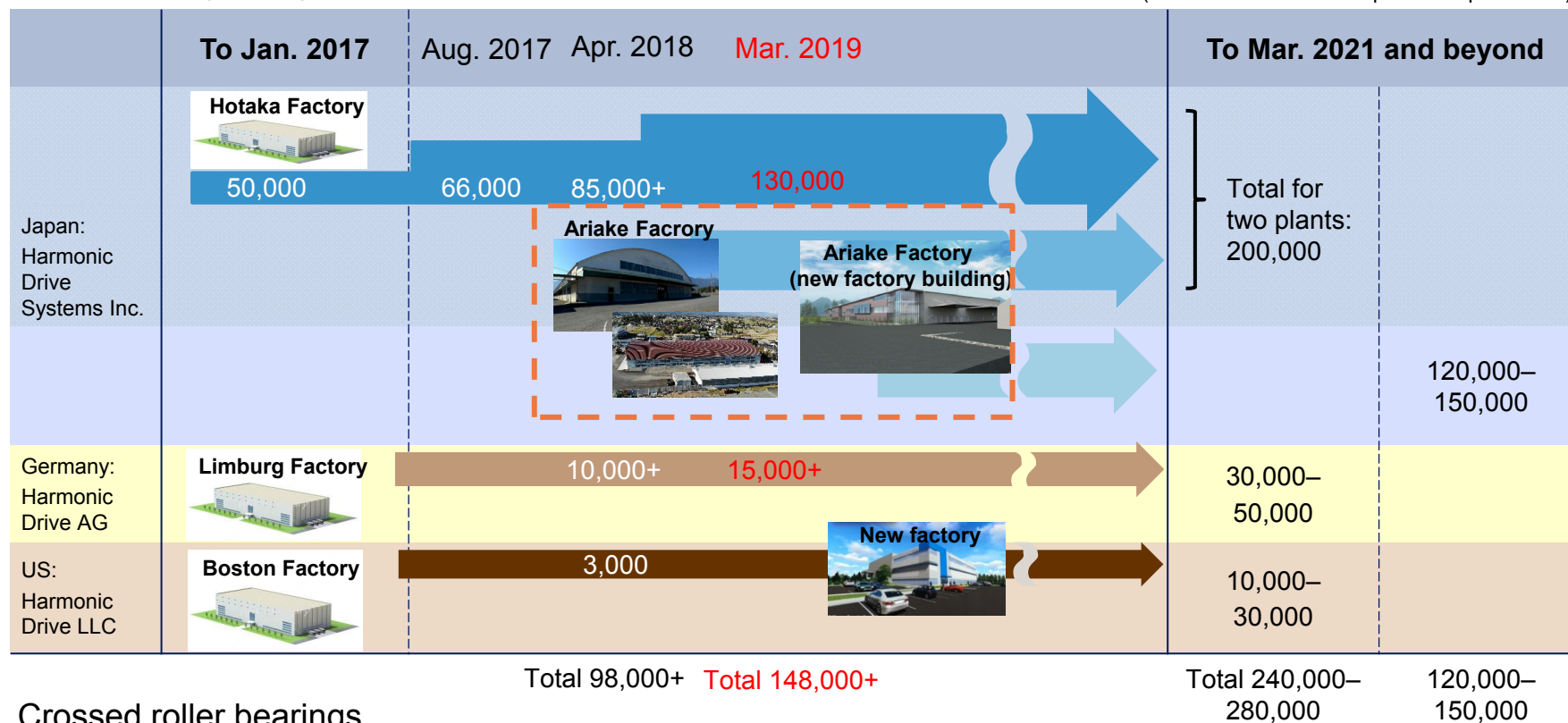
The text is centered and surrounded by several decorative, hand-drawn style blue swirls that frame the content.

Initiatives to Improve QCDS Aimed at Achieving Our Mid-Term Management Targets

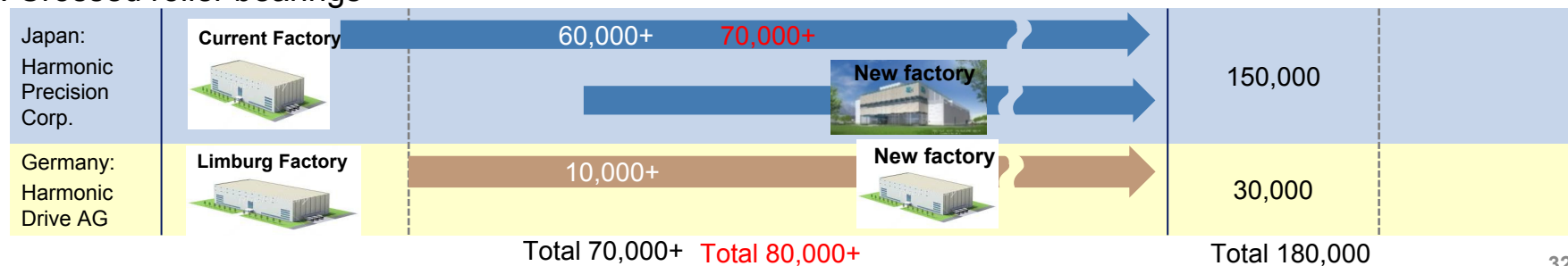
1. Roadmap to raising production capacity

1. Strain wave gearing devices

(Numbers indicate units produced per month)



2. Crossed roller bearings



2. Construction of new plant building at the Ariake Factory

(Azumino, Nagano Prefecture)

- Production base for strain wave gearing devices (HarmonicDrive®)
- Factory designed in anticipation of production increases over the medium term (total floor space of 21,818sqm)
- We plan to step up capital investment in equipment and increase personnel in stages, keeping a close watch on demand trends



3. Construction of new plant building at the Matsumoto Factory (Matsumoto, Nagano Prefecture)

- Production base for crossed roller bearings
- Factory designed in anticipation of production increases over the medium term (total floor space of 23,659sqm)
- Operations to commence in March 2019 after moving part of the assembly and processing lines



4. Construction of new factory building at the US Factory

(Beverly, Massachusetts)

- Production base for strain wave gearing devices (HarmonicDrive®)
- Designed to increased North American local production ratio and meet future demand increases (total floor space of 8,830sqm)



5. Efforts to increase productivity

■ The production system our Group envisions

- We aim to manufacture products that meet the individual needs of customers to the finest detail, backed by our advanced technology and skills.

● Small-lot, multi-variety production

[Applications: small-lot robots, semiconductors, and other general equipment]

1. Our engineers possess advanced skills (processing, assembly, and inspection) that will help flexibly meet customer needs.
2. We have an extensive track record of small-lot, multi-variety production, leveraging our optimal production technology and management system.

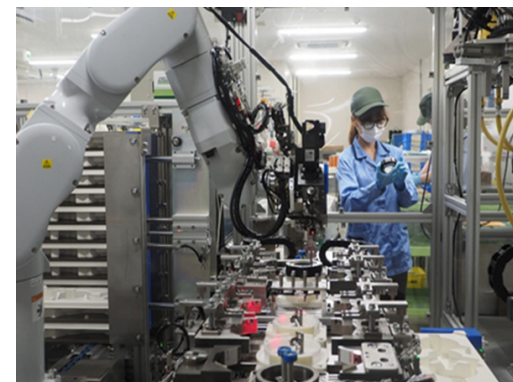
● Medium-lot, small-variety production

[Applications: automotive products and mass-production robots]

1. Our production lines are geared toward automation.
2. We also use our long-standing knowledge and expertise to optimize our automation equipment.

Two-pronged approach
to improve QCDS

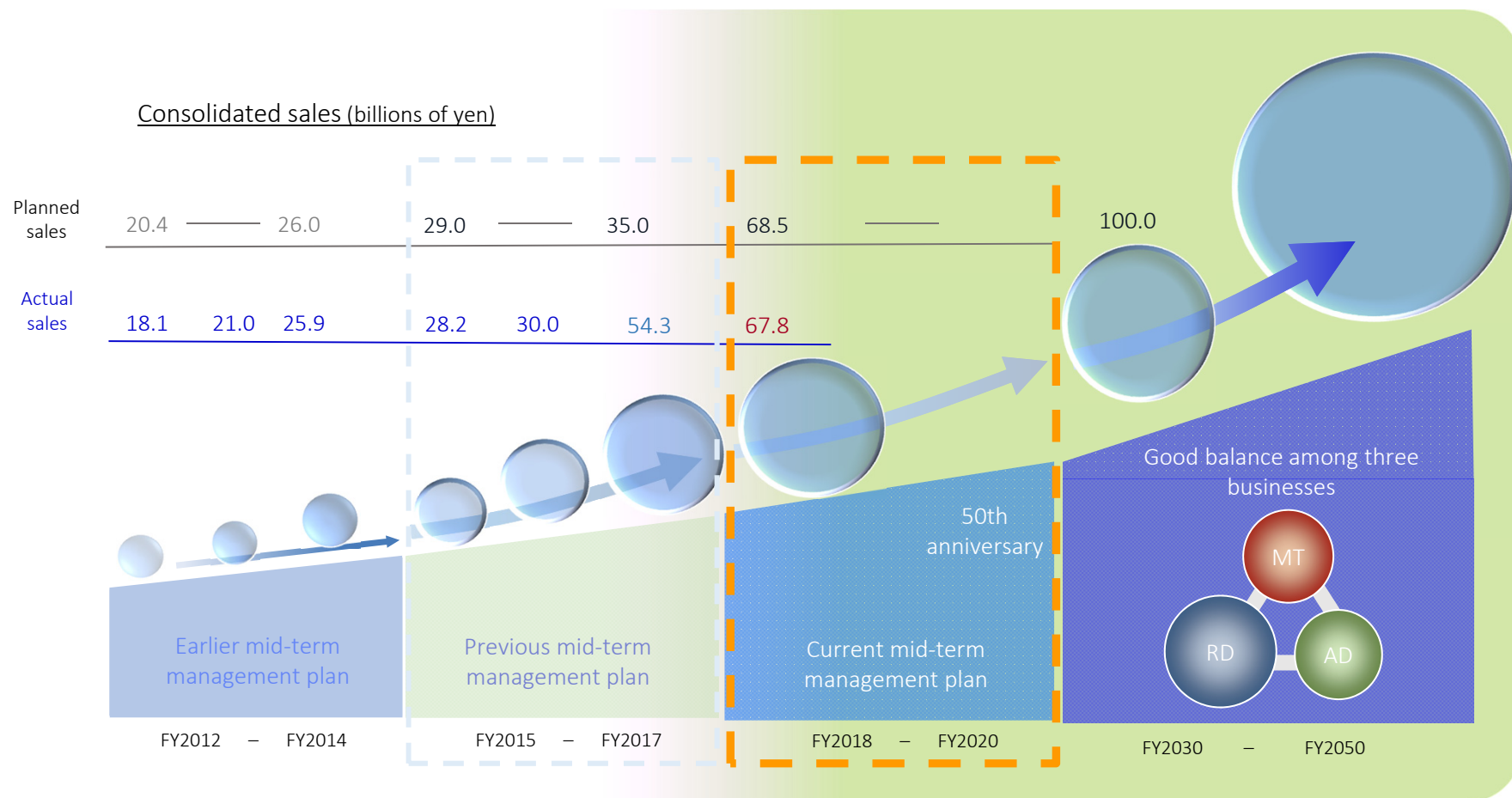
- Q: Further improve quality
- C: Strengthen cost competitiveness
- D: Shorten lead times
- S: Enhance ability to customize



The text is centered and surrounded by several decorative, hand-drawn style blue swirls that frame the content.

Current Mid-Term Management Plan and Aiming for Further Growth Toward 2030 and 2050

Mid-term management plan and long-term vision



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:

Please contact us as follows for material contents and investor information of all kinds.

Corporate Planning Division, Harmonic Drive Systems Inc.

Ichigo Omori bldg. 7F, 6-25-3 Minami-Oi, Shinagawa-ku, Tokyo 140-0013 Japan

Email: ir@hds.co.jp Website: <https://www.hds.co.jp/>