YASKAWA

Briefing Session on Mid-term Business Plan "YASKAWA IR Day 2023"

Robotics Segment

June 1st, 2023

YASKAWA ELECTRIC CORPORATION

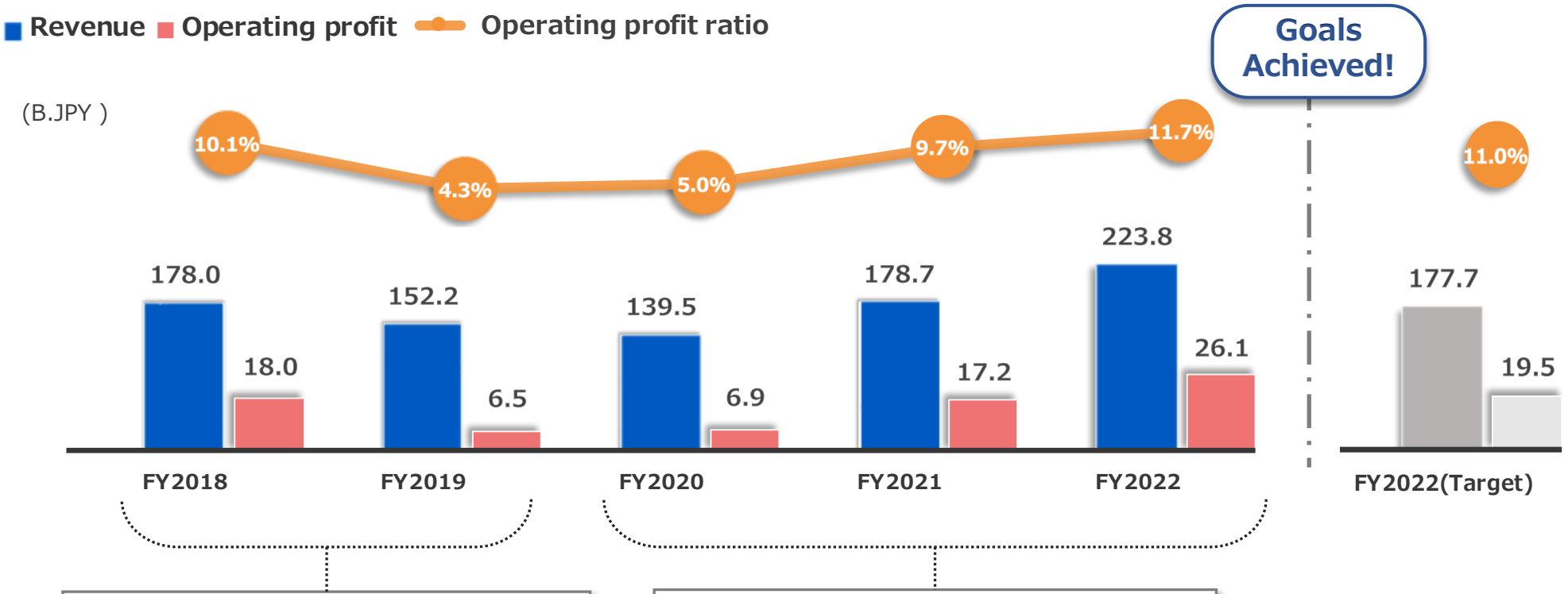
Overview of Robotics Business

Business Overview	Development, production and sales of industrial robots suitable for various applications, including automotive, semiconductor, and general industries
Strengths	・Developed the first Japanese all-electric multi-joint robot in 1977 → Met growing needs for labor saving and automation at production sites → Achieved top-class global market share (one of the world's top 4) ・In-house production of servo motors, the most important element for performance of robots →Secured competitive advantage through improvement of robot performance and reduction of production costs
Business Opportunity	• Increasing automation needs of manual tasks against backdrop of labor shortages • Sophistication of production through the use of IoT • Reformation of manufacturing in the automotive industry
Market Size (Assumption)	【FY2025】 Industrial robot market : Approx. 1.8 tn. JPY (Approx. 1.4 tn. JPY in FY2022) <CAGR> FY2022→ FY2025: +7% *Estimated by Yaskawa

Review of “Challenge 25 Plus” (1)

Achieved goals for revenue and operating income (ratio)

*Highest on record



Although revenue shrank due to US-China trade friction, **surplus was maintained** by profit structure improvement

Even during COVID crisis, **profitability greatly improved** due to production restructuring

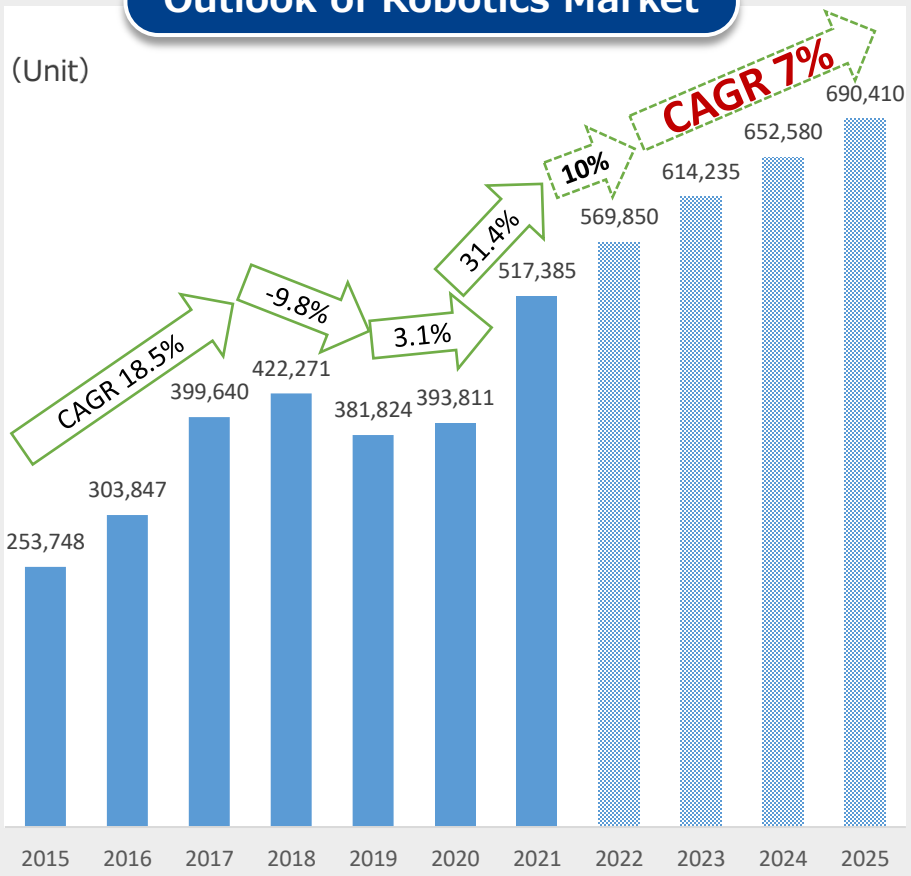
Review of “Challenge 25 Plus” (2)

Initiatives of Challenge 25 Plus	Review
①Expand orders in key markets (Automotive/ General industries)	・Responded to changes in production processes triggered by **the adoption of EVs**, as well as expansion of automation in **battery market** ・Responded to the expansion of robot demand and robotics field against backdrop of **labor shortages** ・Proposed **solutions (improvement/ evolution)** to customers based on **i³-Mechatronics concept**
②Expand product lineup and technological domain by strengthening development capabilities	・**Expanded the product lineup**, especially in **collaborative robot** ・Commercialized a semiconductor wafer transfer robot **“SEMISTAR-GEKKO”**, employing **direct drive motors (no reduction gear)** ・Developed the new **autonomous robot “MOTOMAN NEXT”**
③Enhance production capacity and efficiency in response to volume increase	・Started **local production in Europe** (Slovenia) ・Started operation of **parts factory in China** (**Increasing in-house production and stabilizing parts procurement**) ・Promoted production innovation at **small-robot factory in Japan** to demonstrate **i³-Mechatronics** (required number of personnel was reduced to 1/3 by introducing collaborative robots)

Growth Outlook of Robotics Market

- **Investment in automation increased due to labor shortages, inflation and BCP**
- **A CAGR of robotics market toward 2025 is expected to be 7%**

Outlook of Robotics Market



Source: Forecast of "All type shipments" from IFR World Robotics 2022

Automobile Market

Driven by investment in EV-related businesses, steady growth in capital investment is expected

Semiconductor Market

Although market trends may fluctuate in the short term, stable growth is expected in the mid-to-long term

General Industrial Market

Repetitive work areas (Conventional robotization areas)

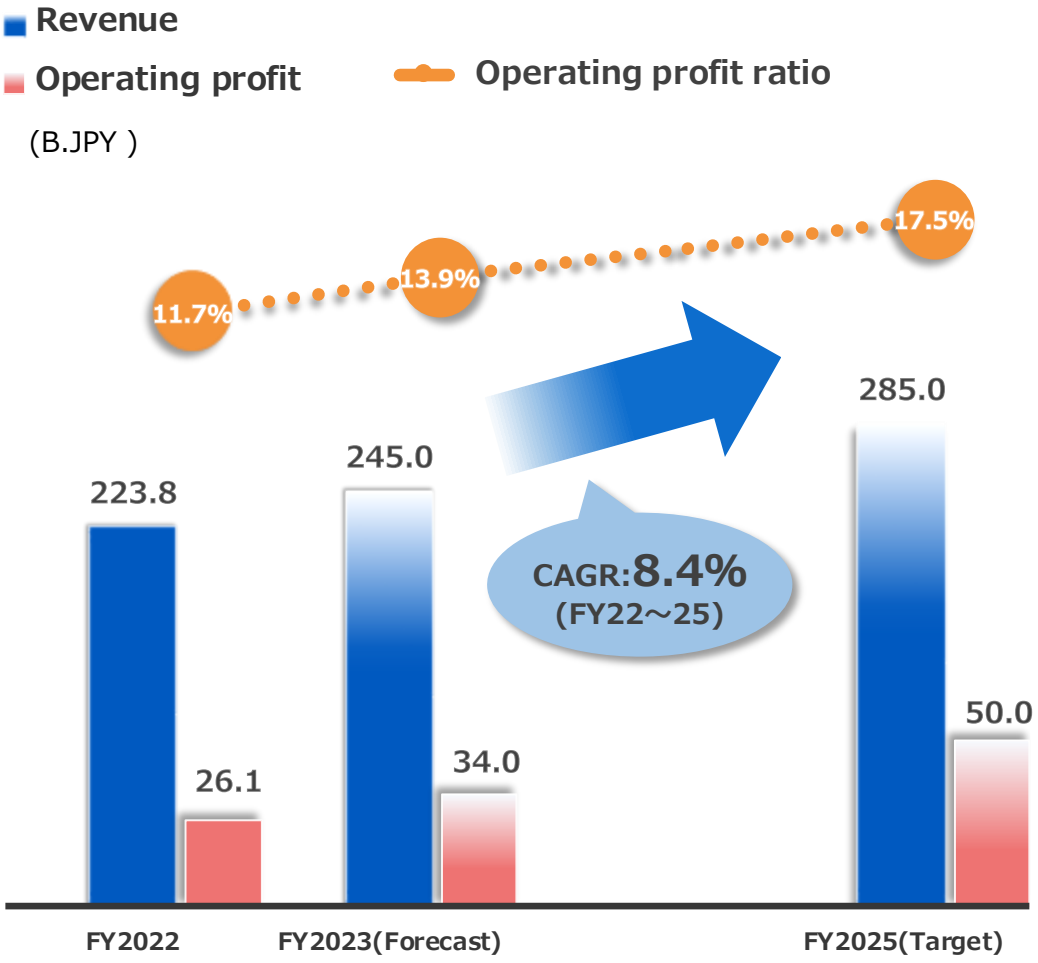
Continued investment in growth areas (solar/ battery). Automation needs expands in a wide range of areas (Electrics and electronics, industrial machinery, construction machinery) against the backdrop of global labor shortages.

Amorphous work area

Demand for robotization is growing in a wide range of industries due to labor shortages.

Mid-term Business Plan “Realize 25” Policies and Goals

- **Demonstrate i³-Mechatronics to expand automation domain**
- **Reinforce business execution capabilities (development/production/sales) to realize a world’s top profit structure**



Realize 25

〈Financial target〉

Revenue	:	285.0 B.JPY
Op. profit	:	50.0 B.JPY
Op. profit ratio	:	17.5%

〈Keywords〉

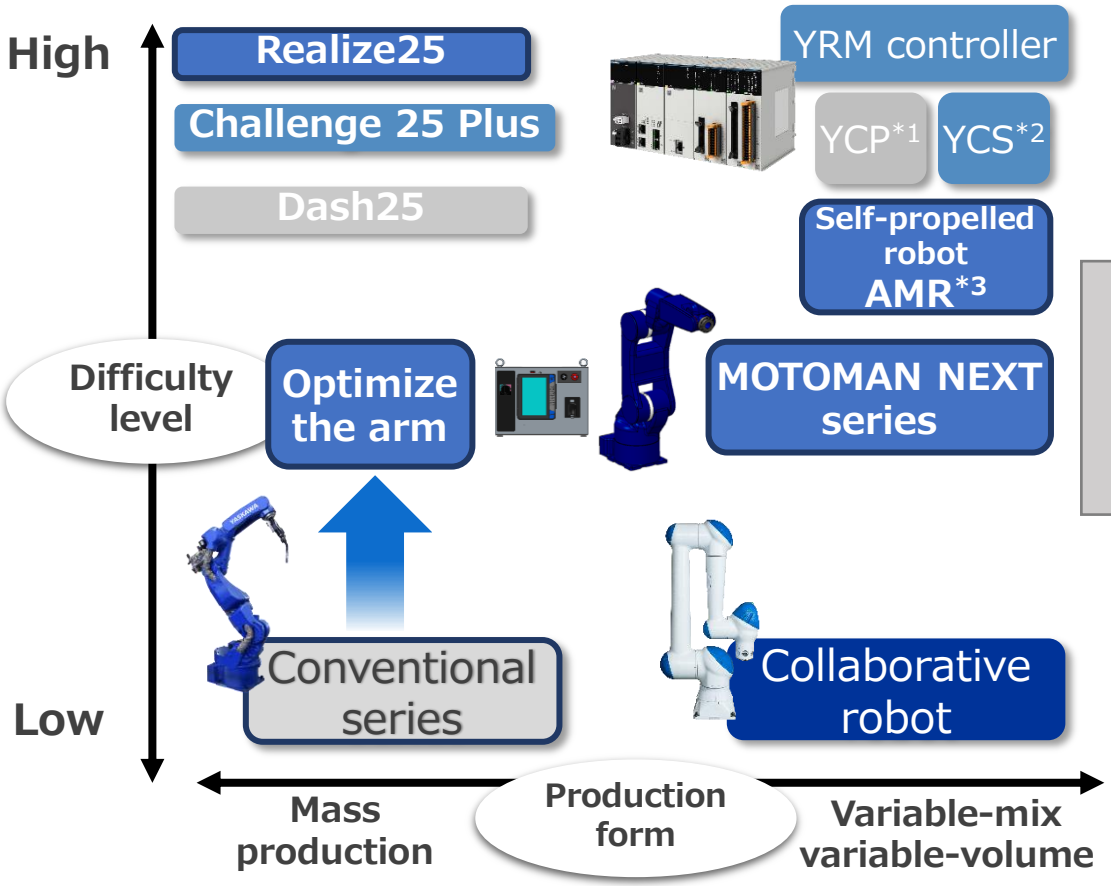
Demonstrate i³-Mechatronics and create customer value

Development : Market launch of MOTOMAN NEXT series
Production : Reinforce in-house manufacturing of parts and global production capacity
Sales : Capture demand by expanding solutions for growth markets

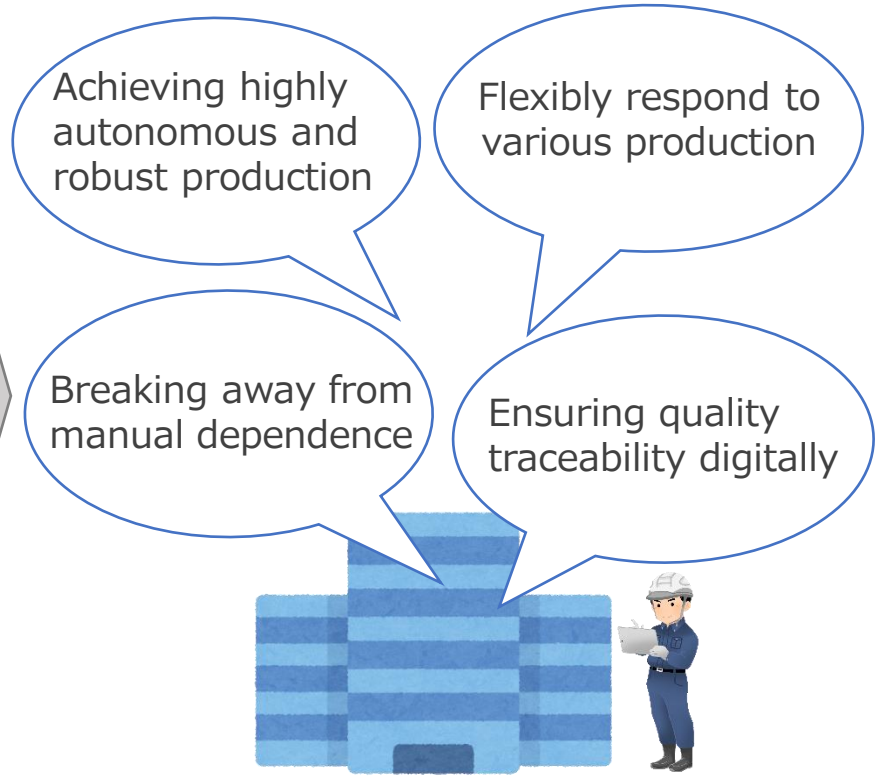
Demonstrate i³-Mechatronics and Create Customer Value

Create customer value by developing products for i³-Mechatronics demonstration toward automation that enables variable-mix variable-volume production and adapts to process changes

Products for i³-Mechatronics demonstration



Creating customer value



*1 YASKAWA Cockpit: Software tool that can collect and visualize data, and store/analyze data in one operation
*2 YASKAWA Cell Simulator: Tool that build and simulate production lines in a virtual environment
*3 Autonomous Mobile Robots

【Development】Market Launch of MOTOMAN NEXT Series (Scheduled for Sep. 2023 in Japan)

With MOTOMAN NEXT's platform and unique technology of channel partners, robots become autonomous and deployed in high-difficulty work areas, which is a huge market

MOTOMAN NEXT

Autonomous robot; capable of dealing with unautomated areas with many "changes" and "uncertainties"

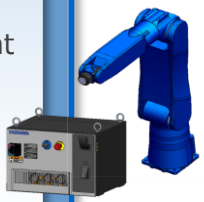
- Autonomous operations based on work environment information
- Zero gap between command and actual operation
- High speed, high trajectory, easy operation
- Automatic path generation
- From "movement" instructions to "work" instructions
- Open innovation ecosystem

+

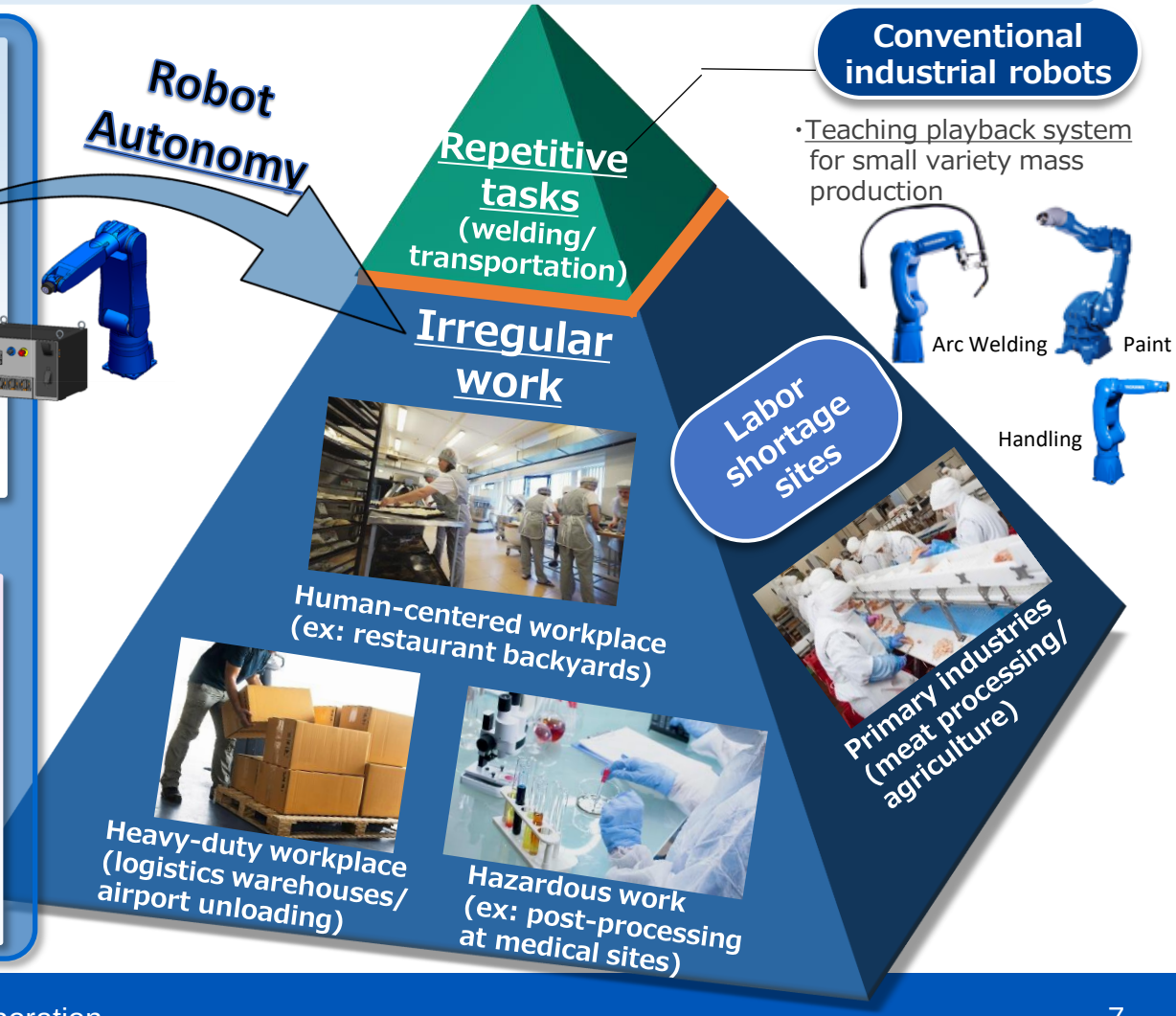
Channel partners

- Unique technology such as academic/venture
- Speedy development capability
- Huge software-centric entry opportunities

Academia venture | SIer | End user | IT/Sensor partner



Robot Autonomy



Conventional industrial robots

・Teaching playback system for small variety mass production

【Production】Reinforce In-house Manufacturing of Parts and Global Production Capacity

Japan (mother factory)

Robot plant in Japan

Establishment of integrated production system

- Build **an integrated production system from parts (robot motors and machining of arms) to assembly**

Expansion of automation area

- **Unmanned production processes** after materials are stocked **at new machining plants**
- Establish quality traces such as **screw tightening and application processes**
- Promote automation in **assembly, warehouse and serving areas**

Establish a production platform by linking all motor, casting, parts and manufacturing quality data

China

Improve production efficiency by fully utilizing Changzhou's parts plant

Europe

Improve production efficiency and capacity

The U.S.

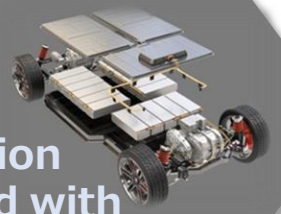
Consider local production

【Sales】Capture demand by expanding solutions for growth markets①

- **Automotive manufacturing has evolved, and the need for automation has become more sophisticated**
- **Expand Yaskawa's unique high value-added solutions**

Trends of auto industry

- Innovation of production lines
- Expansion of production investment associated with changes in manufacturing due to the adoption of EVs



Needs for automation

- Improve manufacturing by using data
- Automation to accommodate variable-mix variable-volume production
- Solutions for changes in automobile manufacturing due to EVs

Examples of Yaskawa's unique solution proposals

①Improve manufacturing by using data	②Automation to accommodate variable-mix variable-volume production	③Solutions for changes in automobile manufacturing due to Evs
Digitalize the state of the manufacturing floor ➢ Collect and accumulate real-time, time-synchronized data ➢ Visualization of traceability data YRM controller YCP 	**Increase physical diversity** ➢ Fence elimination and layout flexibility **Autonomous decentralized control to respond to changes** ➢ Each device is connected by data and moves autonomously according to the situation Collaborative robot  YRM controller YCP/YCS 	**Expand portfolio for EV market** ➢ Inter-device transport and in-vehicle unit transport for larger batteries ➢ Transport in battery manufacturing equipment Heavy-duty transfer robot  Scara robot 

【Sales】Capture Demand by Expanding Solutions for Growth Markets②

Accurately identify trends in the semiconductor market and expand the product lineup to accommodate the switch to advanced semiconductors

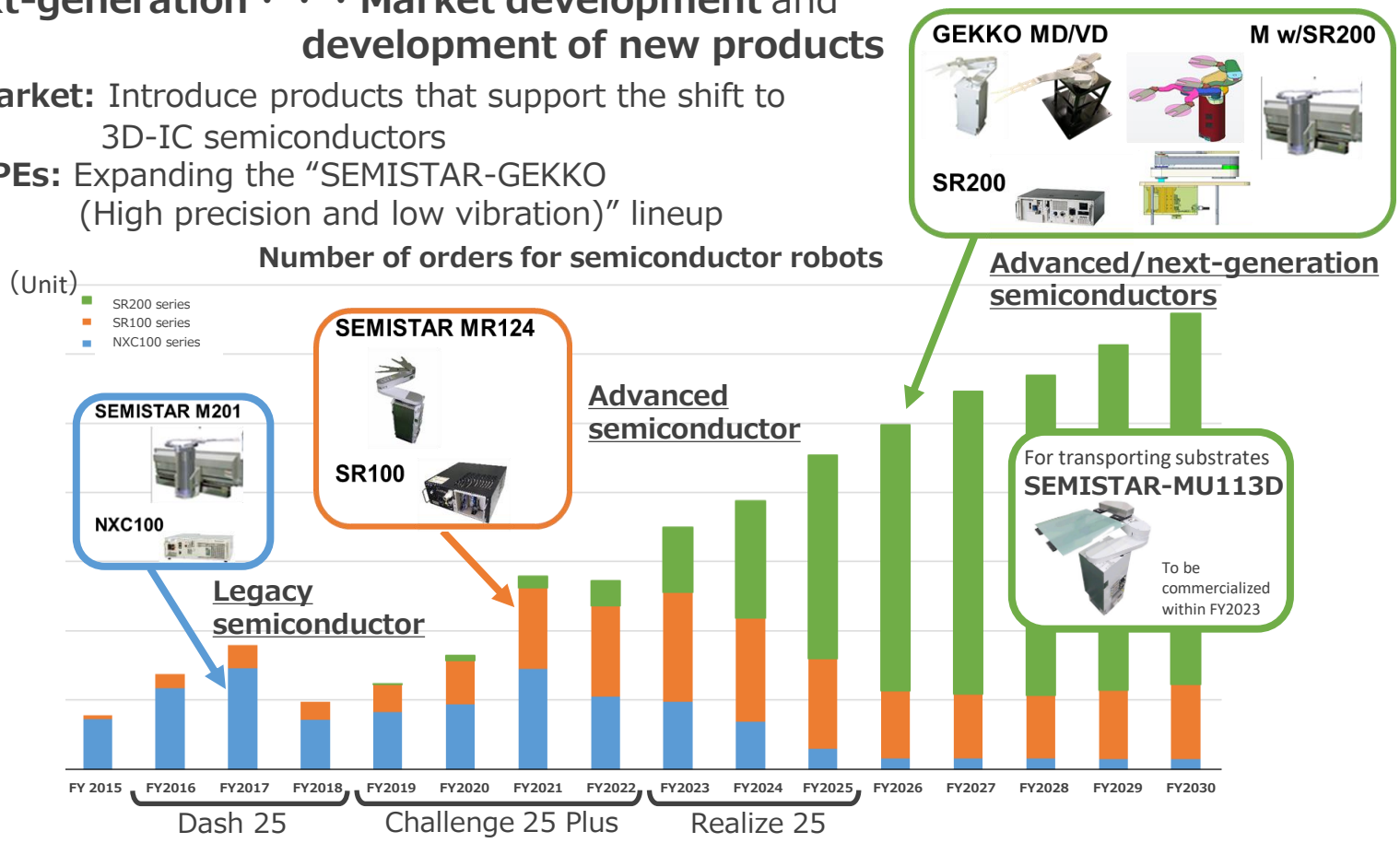
(1) **Advanced Semiconductors**・・・Accelerating robot development to meet the demand for **higher density production lines**

(2) **New markets/Next-generation**・・・**Market development** and **development of new products**

① **3D-IC package market:** Introduce products that support the shift to 3D-IC semiconductors

② **Entering major SPEs:** Expanding the “SEMISTAR-GEKKO (High precision and low vibration)” lineup

・“The SEMISTAR-GEKKO MD124D”, equipped with a direct drive motor, achieves high precision and low vibration without a reduction gear
・”SR200”, a standard controller for clean robots



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