

Sustainable and Productive Manufacturing

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YASKAWA ELECTRIC CORPORATION

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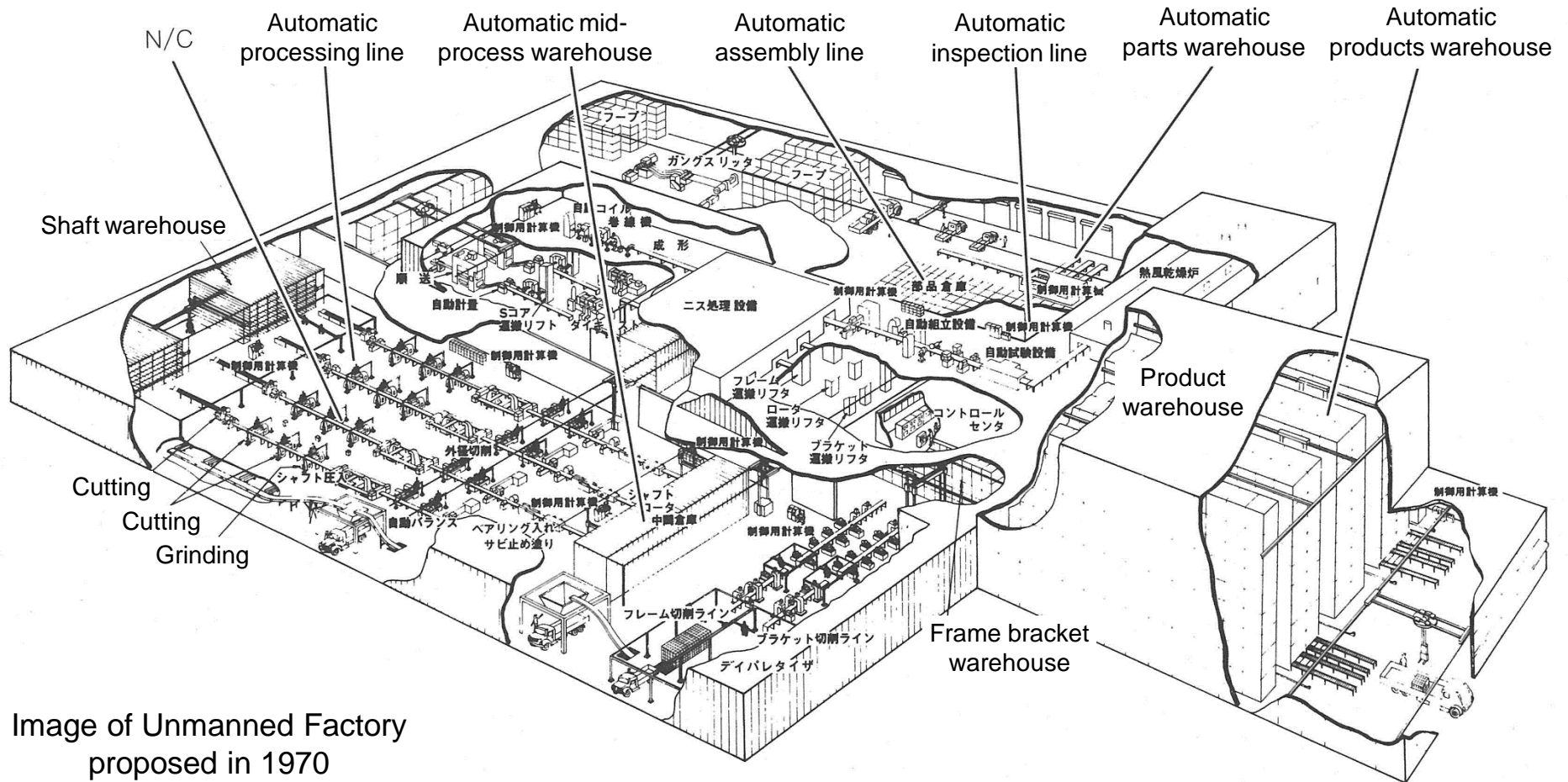
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1. History of Manufacturing

**Unmanned Factory Concept - Ideal Motor Factory -
Pursuit of Cutting-Edge Manufacturing at the Mother Factories**

Unmanned Factory Concept - Ideal Motor Factory -

Unmanned Factory: A term coined by Yaskawa meaning a **human-centered automation factory** while moving away from manpower dependence. We differentiate it from **“no-man,”** which marginalizes human intervention.



Pursuit of Cutting-Edge Manufacturing at the Mother Factories - Challenges to Realize Unmanned Factories -



1990

Moteman Center

"A factory where robots assemble robots"



2006

Flexible automatic assembly line
utilizing IC tag



2014

Space-saving automatic assembly method
(Compact line)



2018

Yaskawa Solution Factory

An i³-Mechatronics demonstration plant



2022

Robot production line utilizing human
collaborative robots



2024

Robot component plant for internal
production realizing 24 hour unmanned
operation

2. Global Production Strategy

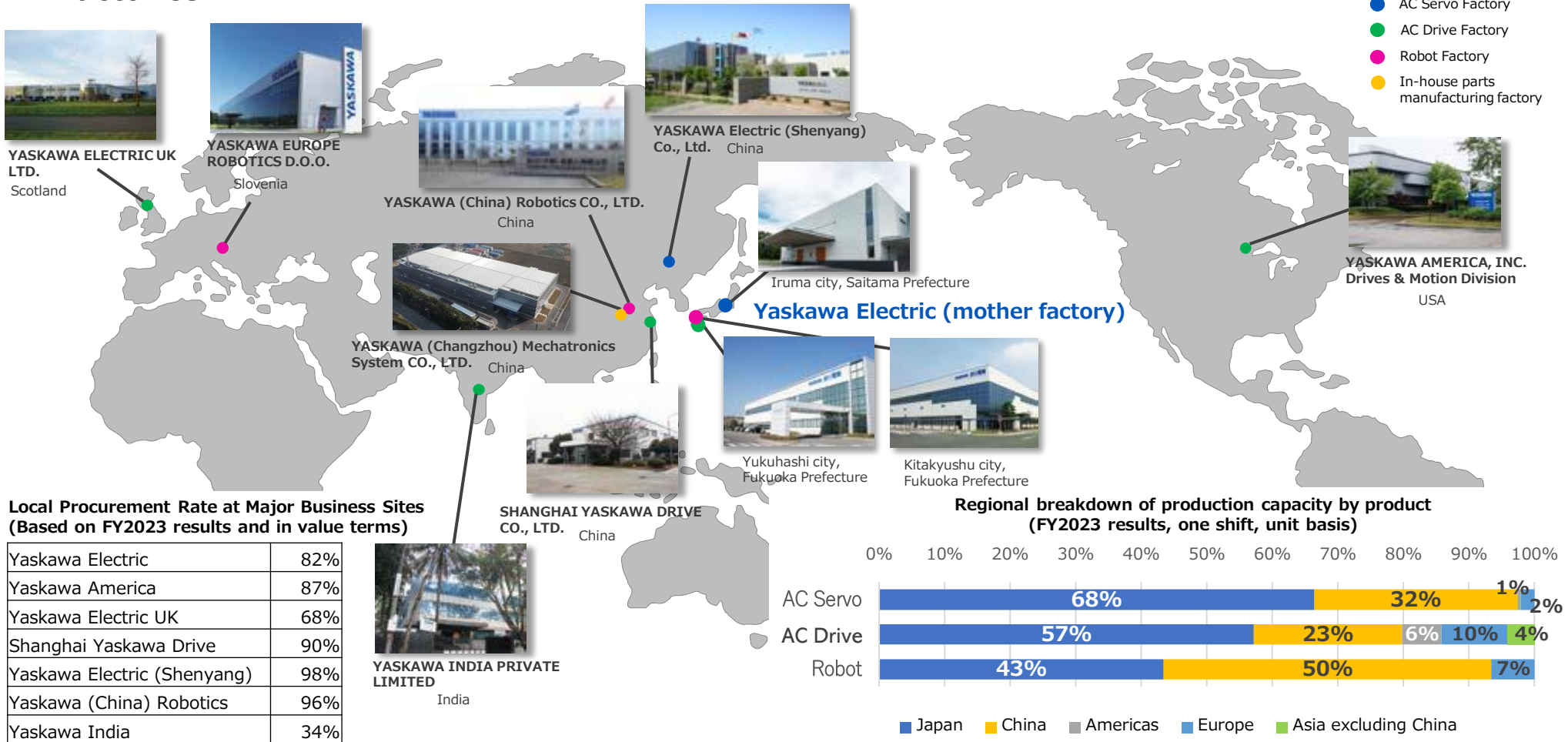
Demand Area Production

Targets and Progress in the "Realize 25" Mid-Term Plan

Challenges for Realizing Sustainable and Productive Manufacturing

Demand Area Production

- Based on the demand area production policy, we have established a system that is resilient to demand fluctuations and environment changes (forex fluctuations and geopolitical risks).
- Global horizontal deployment of cutting-edge manufacturing demonstrated at the mother factories



Targets and Progress in the "Realize 25" Mid-Term Plan

In the mid-term plan "Realize 25," we set the following as the pillars of our policy, and carry out activities to achieve the KPIs.

- **Evolution of our own “manufacturing” through i³-Mechatronics**
- **Building a global optimized production system and resilient supply chain**

	KPIs (FY2023 Results)	KPIs (FY2025 Targets)	Purpose
Improvement of direct productivity (no. of units produced per direct personnel at factories in Japan and China)	10% improvement (Compared to FY2022)	46% improvement (Compared to FY2022)	Promote automation through i ³ -Mechatronics solutions at our own production sites, and improve product competitiveness by pursuing higher productivity and production management.
Increase in global production capacity (no. of units we can produce)	6% improvement (Compared to FY2022)	36% improvement (Compared to FY2022)	Improve production capacity and productivity in response to expanding demand and build a global production system that is resilient to environmental changes and risks.
Implementation of in-house substrate manufacturing plans	Japan: 45% China: 42% (FY2021: 19%· Global)	Japan: 57% China: 62% (FY2021: 19%· Global)	
Reduction of environmental impact through products and reduction of CO₂ emissions in in-house production processes	Achieved CCE100 (125.9 times)	Achieve CCE100*	Contribute to a sustainable society through sustainable manufacturing.

*Contribution to Cool Earth 100: Our goal to make reduction of the CO₂ emissions through our products 100 times or more of the amount emitted by the Group by 2025

Challenges for Realizing Sustainable and Productive Manufacturing

Establishment of **robust productivity** that can cope with variable-mix variable-volume production for sustainable manufacturing

① Production system with minimum manpower dependence

- In response to the rapid increase in orders between FY2021 and FY2022, securing a production system under the impact of the COVID-19 became an issue.
- We need to further automate to minimize our dependence on manpower.

② Supply chain optimization

- Based on the basic policy to reduce procurement costs, we traditionally selected suppliers individually.
- We selected candidate components for internal production from the perspective of overall efficiency beyond costs, technology inheritance and procurement risk.

① Total efficiency	Added value of parts, difficulty of in-house production, reduction of procurement lead time, and quality cost
② Sustained improvement of product QCD*	Necessity of retaining and improving product development and production technologies
③ procurement risk (BCP)	Dependence on specific suppliers (Region/Country, Company) and whether there are alternatives

*Quality, Cost and Delivery

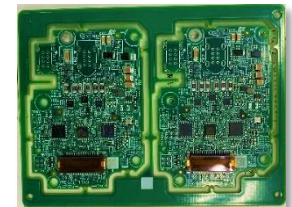


i³-Mechatronics

Evolution of manufacturing independent of manpower



Machining
(Shaft, robot parts)



Board mounting



Resin molding

Promotion of in-house manufacturing with automation

3. Way Forward

Strengthening the Global Optimal Production System Based on the Promotion of Demand Area Production and In-House Manufacturing

Transformation of Robot Production in Japan

- Initiatives for Integrated Production of Robots and Motors -

Strengthening Production Systems to Provide Further Value to Customers in Europe

Investment to Strengthen Response to Growth Markets in North America

Strengthening the Global Optimal Production System Based on the Promotion of Demand Area Production and In-House Manufacturing

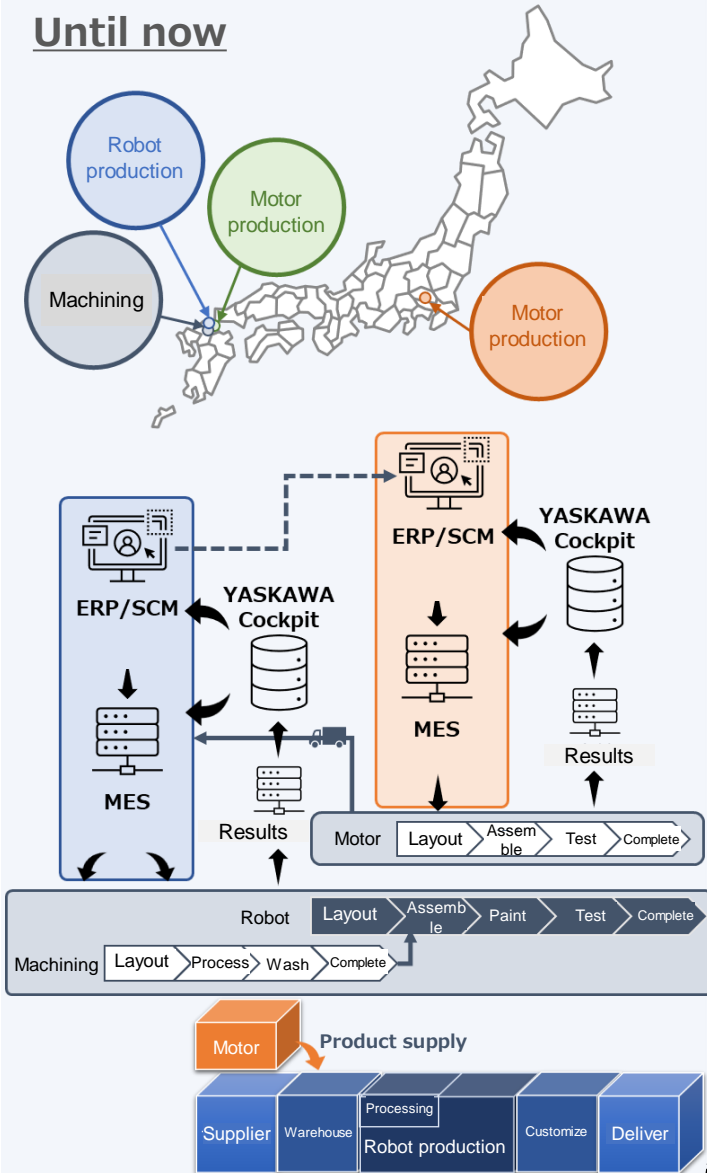
Implementation of plans to realize global optimum production in Japan and overseas

Region	Location	Main measures		Purpose			
				Enhancement of mother plant functions	Enhancement of demand area production	Enhancement of internal production	
Japan	Kitakyushu, Fukuoka	•New robot machining factory	Mar. 2024	●		●	
		•New robot factory (integrated production of motors)	Mar. 2026	●			
	Yukuhashi, Fukuoka	•South-Yukuhashi business site (Yaskawa Automation Drive)	FY2026	●			
		•New AC drive factory	FY2028	●		●	
		•New resin molding parts factory	FY2028			●	
Overseas	China	•Expansion of substrate line	FY2023 – 2025		●	●	
		•New machine controller production line	FY2024		●		
	Asia	Vietnam	•New factory (production of substrates for production in Europe, the U.S. and India)	FY2026		●	●
	Europe	Slovenia	•Robot factory No.2 (engineering and systems)	FY2025 2Q		●	
			•Consolidation of European logistic functions	FY2025 2Q		●	
	Americas	United States	•Expansion of the robot system plant	Jul. 2024		●	
			•Consideration of production of robots	FY2027		●	
•New manufacturing base for motion solutions for semiconductor industry			FY2026		●		

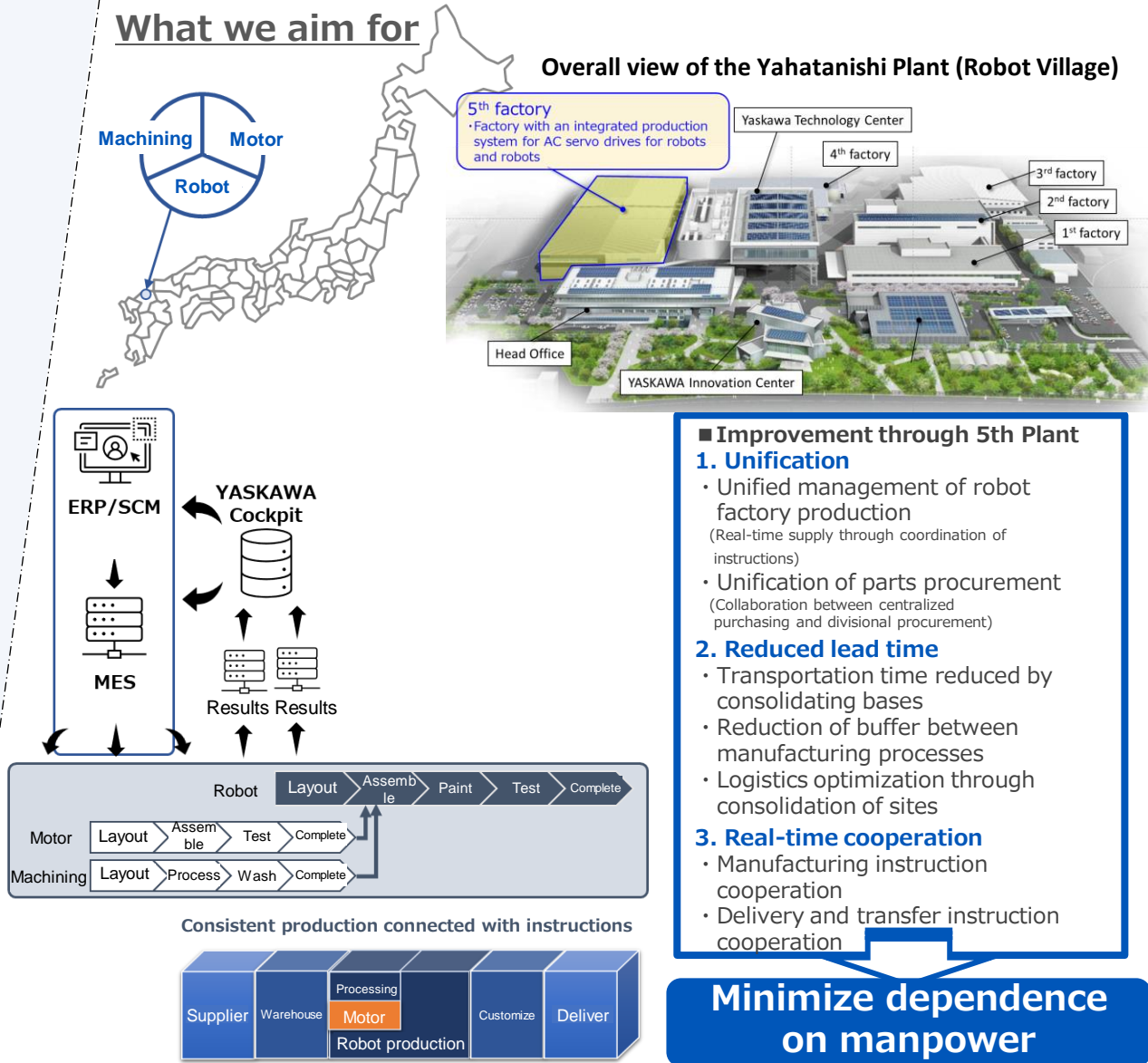
Transformation of Robot Production in Japan

- Initiatives for Integrated Production of Robots and Motors -

Until now



What we aim for



- Improvement through 5th Plant
- 1. **Unification**
 - Unified management of robot factory production (Real-time supply through coordination of instructions)
 - Unification of parts procurement (Collaboration between centralized purchasing and divisional procurement)
- 2. **Reduced lead time**
 - Transportation time reduced by consolidating bases
 - Reduction of buffer between manufacturing processes
 - Logistics optimization through consolidation of sites
- 3. **Real-time cooperation**
 - Manufacturing instruction cooperation
 - Delivery and transfer instruction cooperation

Minimize dependence on manpower

Strengthening Production Systems to Provide Further Value to Customers in Europe

Building a flagship base for the European robotics business implementing i³-Mechatronics by expanding the **Robot Factory No.2 (engineering & systems factory)** and the **EMEA Robotics Distribution Center (ERDC)** next to the existing factory.

Location	Kočevje, Slovenia
Total floor area	Factory No.2 Approx. 10,000 sqm ERDC Approx. 10,000 sqm
investment amount	Approx. 5 billion JPY
Start of operation	Scheduled to be completed and start operation in FY2025
Production capacity	850 units/month (after expansion)
Purpose	<ul style="list-style-type: none">• Enhance customer responsiveness as a base for solution technology by consolidating development, production and system plants• Reduce delivery lead time, reduce logistics costs and realize optimal inventory by consolidating logistic functions

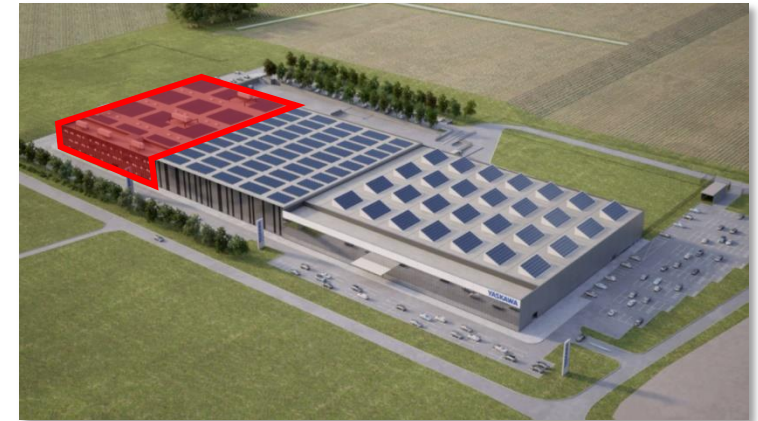


Image of YASKAWA Europe Robotics after expansion (Red area: Robot Factory No.2)



Local production of robots

Investment to Strengthen Response to Growth Markets in North America

By investing in and increasing our presence in the North American market, which is expected to grow, we will achieve the following.

- **Strengthen responses to new needs** for automation and labor-saving in the general industry sector
- Further strengthen relationships with existing customers in the **North American semiconductor market**

Investment region

Wisconsin and Ohio, USA

Investment

Approx. 30 billion JPY

Period

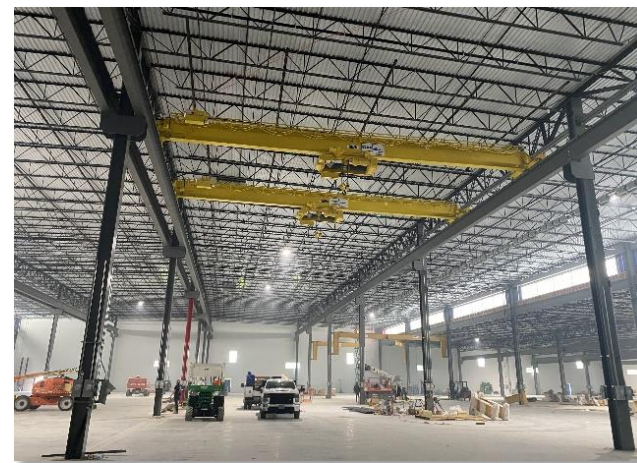
Until FY2027 (Plan)

Purpose

- ① Strengthening the robotics business
 - Expansion of the robot systems plant
 - Production of robots (under consideration)
- ② Strengthening response to North American semiconductor market
 - New manufacturing base for motion solutions for the semiconductor market



YASKAWA America's existing plant for robot systems



Interior view of the robot systems plant (under construction) in Ohio, USA

YASKAWA