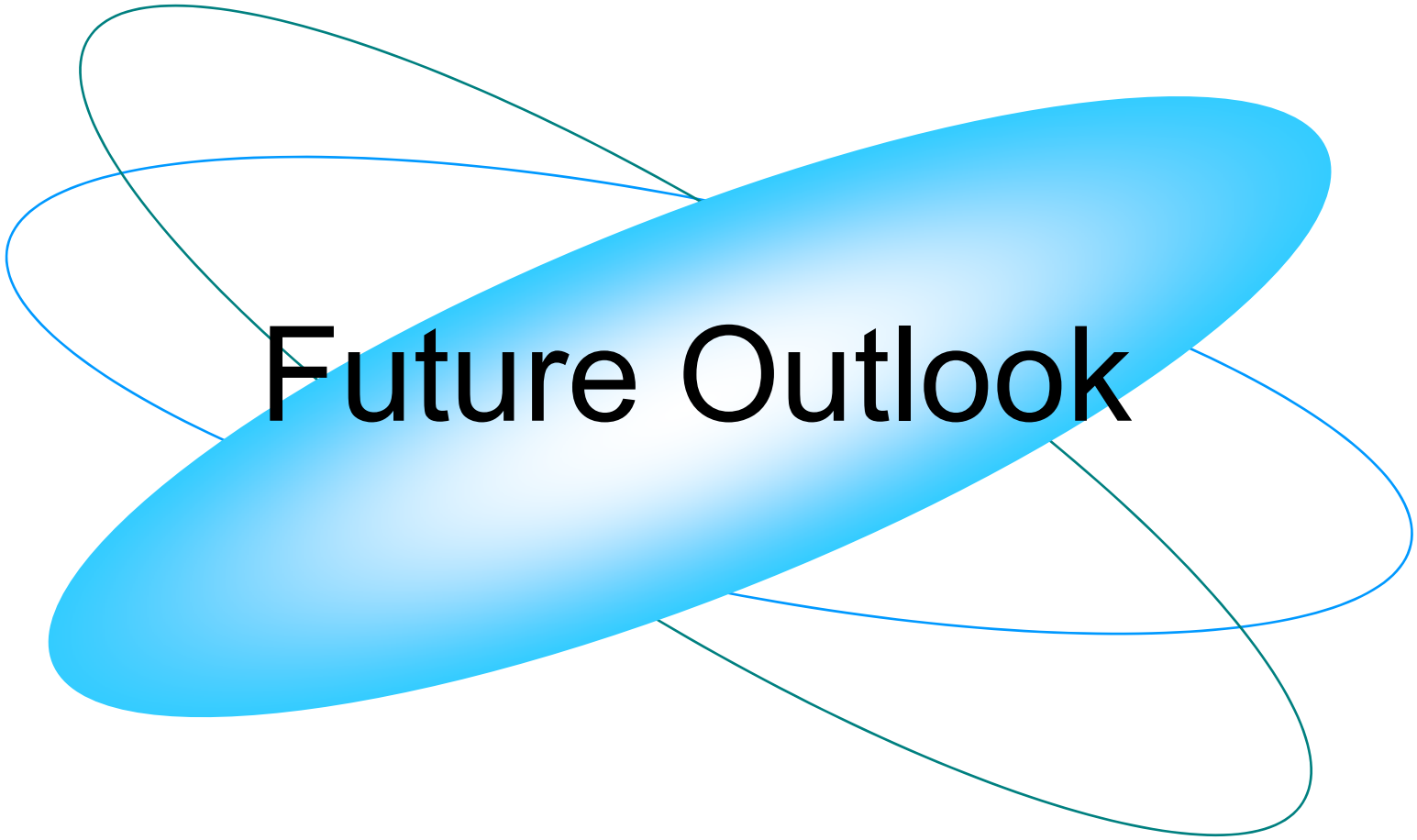
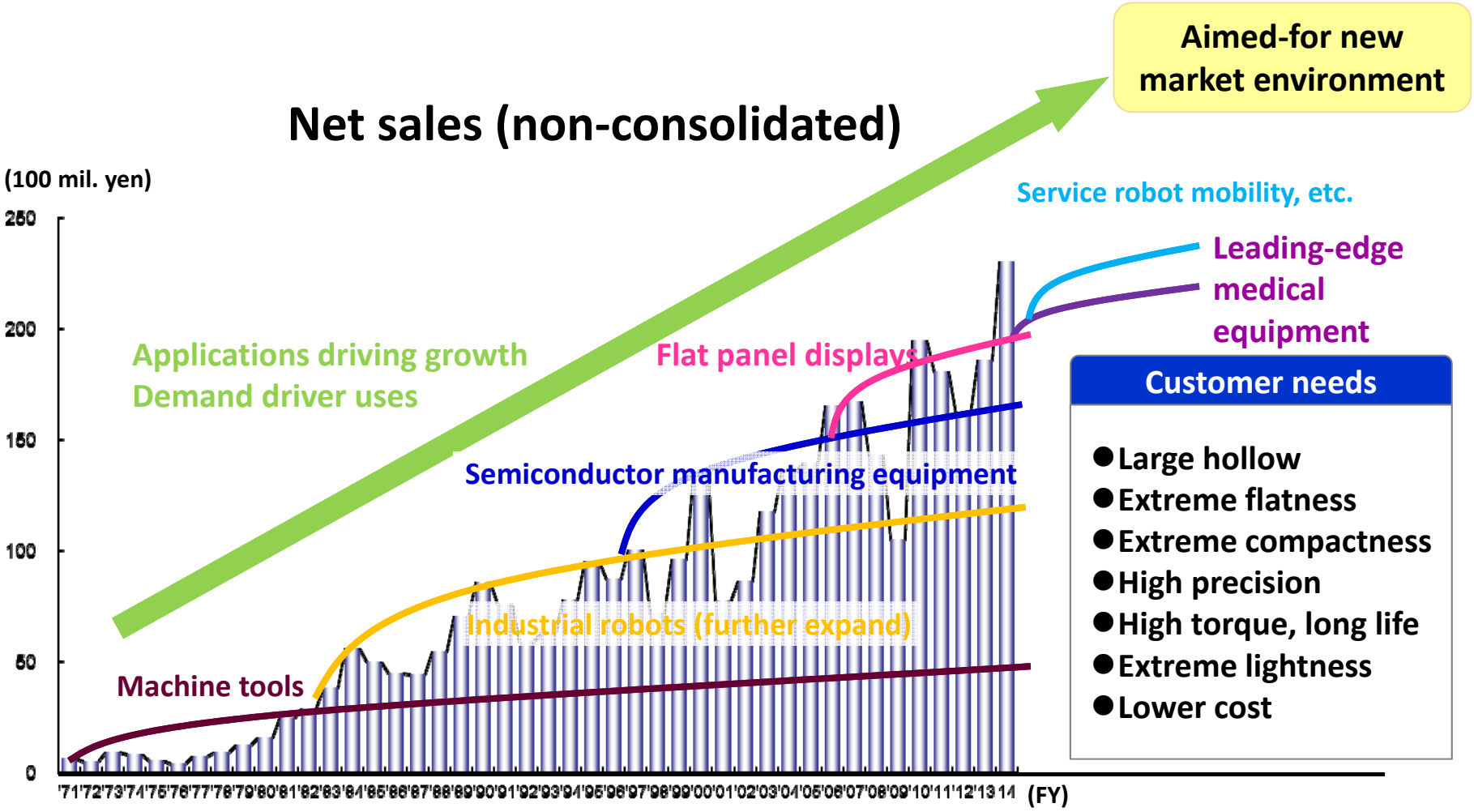


Our Growth Trajectory



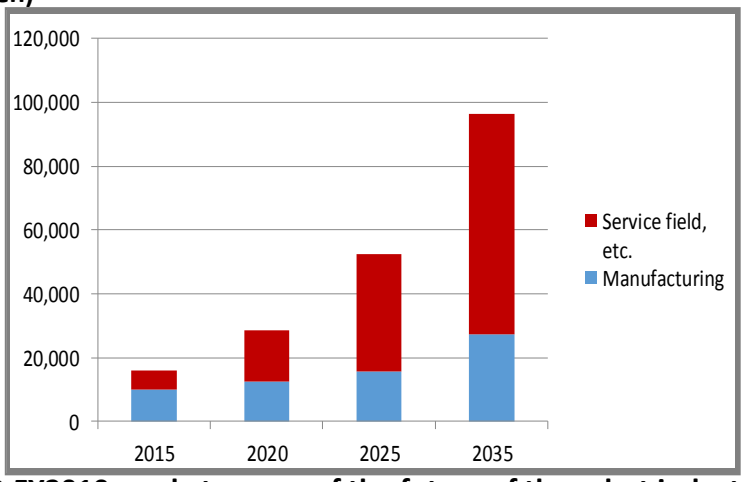
Robot Industry Classifications

Classification		Use	Reduction gear requirements
I. Industrial robots	Industrial robots	Making things on the factory floor	High precision, high reliability
	Co-bots		→ Low cost?
II. Service robots	Professional robots	Medical, nursing care, rehabilitation, logistics, resource extraction	Compact, light weight, flat, high precision
	Consumer robots	Consumer electronics, hobbies, toys	Low cost

Source: IFR and KDDI Research Institute with our additions

Many different nations, companies, and research institutions have high hopes for expansion of the robot industry.

(100 mil. Yen)



Source: MITI/NEDO FY2010 market survey of the future of the robot industry

Drivers of Further Growth

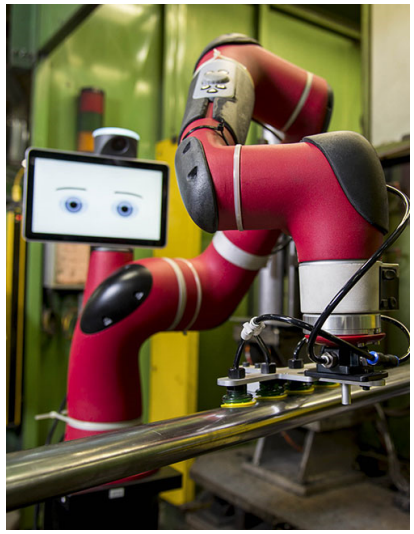
Emerging of the market for collaborative robots (“co-bots”)

Start-up firms

- Universal
- Rethink
- LifeRobotics

Entry of leading makers

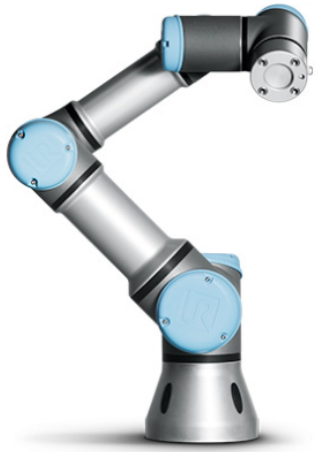
Japan/Europe
leading robot makers



From Rethink Robotics website

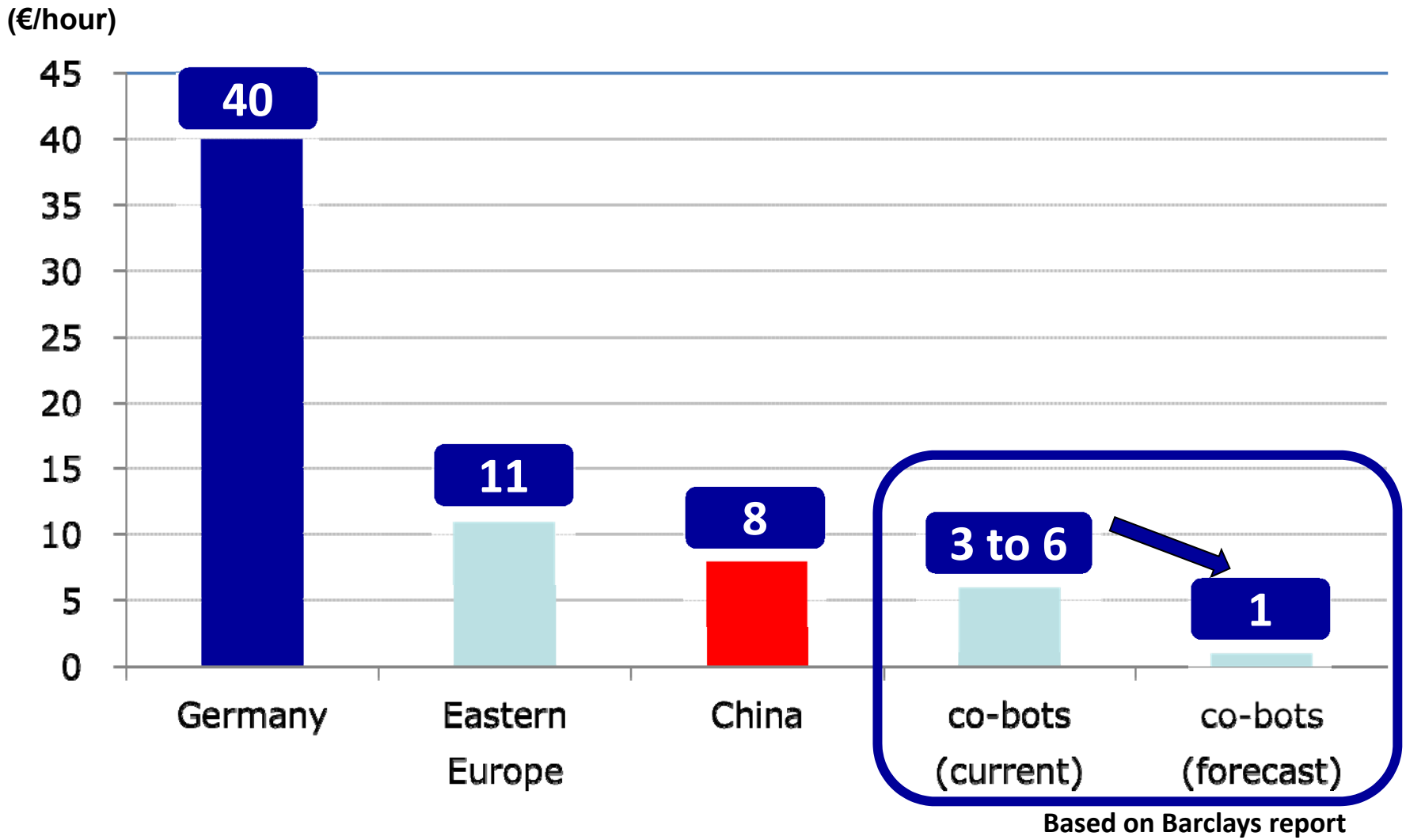
From Life Robotics website

Superiority of co-bots
1. Safety (no need for barrier)
2. Shorter teaching time
3. ・・・・



From UNIVERSAL ROBOTS website

Co-bots vs. Labor Costs

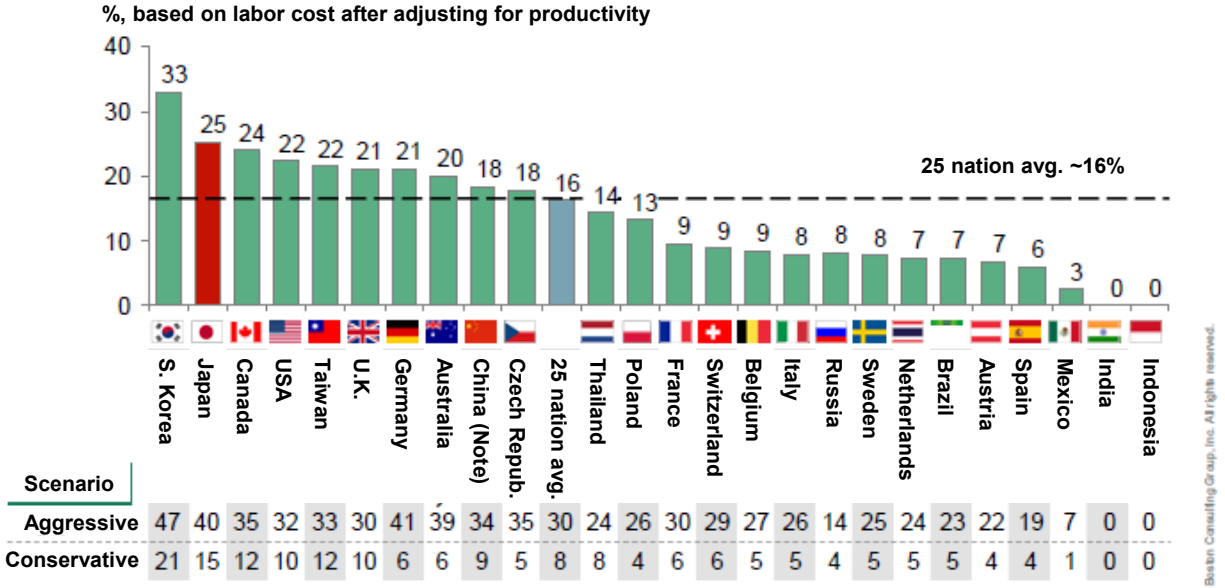


Based on Barclays report

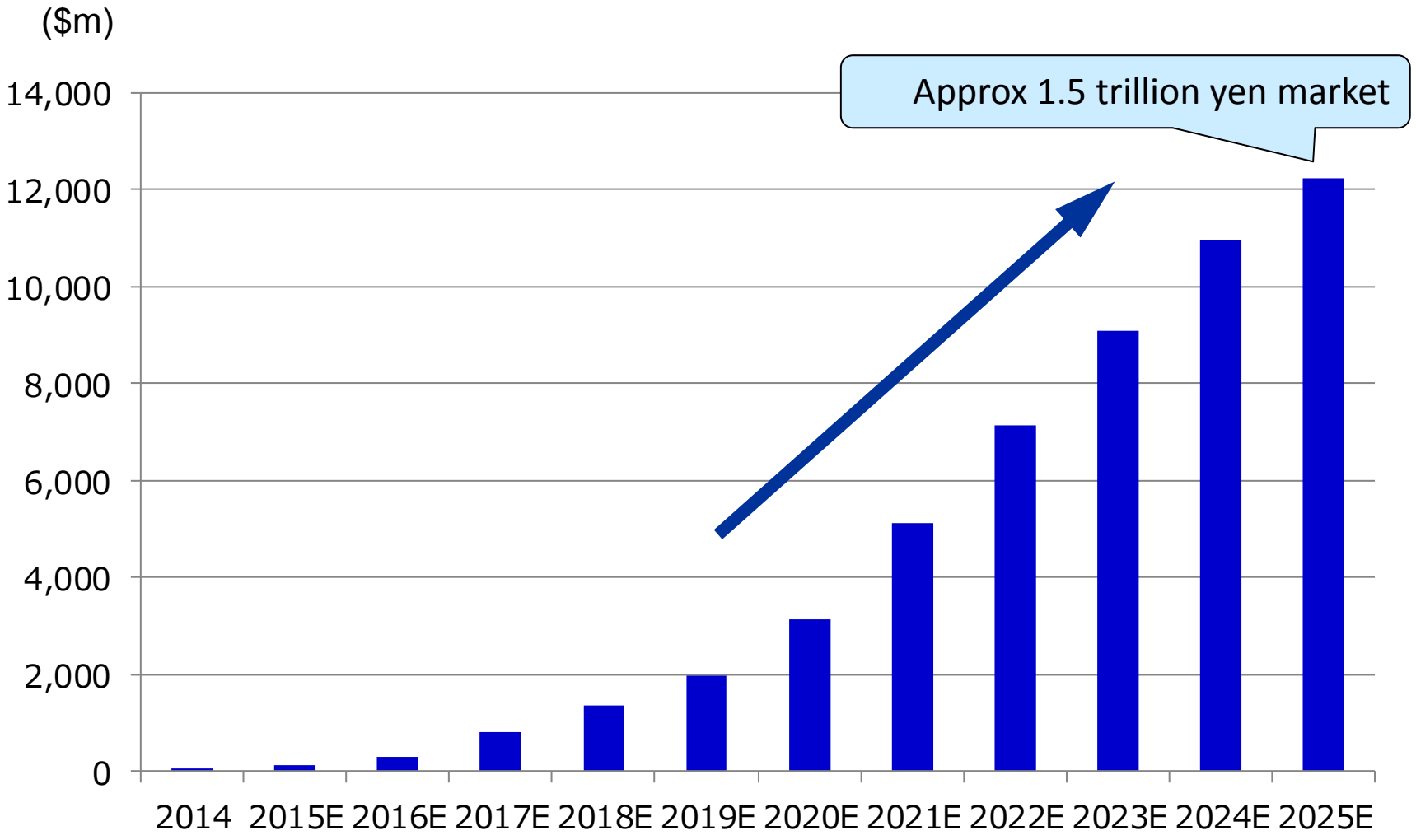
co-bots Market

Rate of labor cost reduction due to rapid expansion of industrial robot use
The more economically developed a country, the higher its labor costs, raising expectations for robot introduction.

Fig. 1: Rate of labor cost reduction with rapid expansion of industrial robot use (2014 vs. 2025)

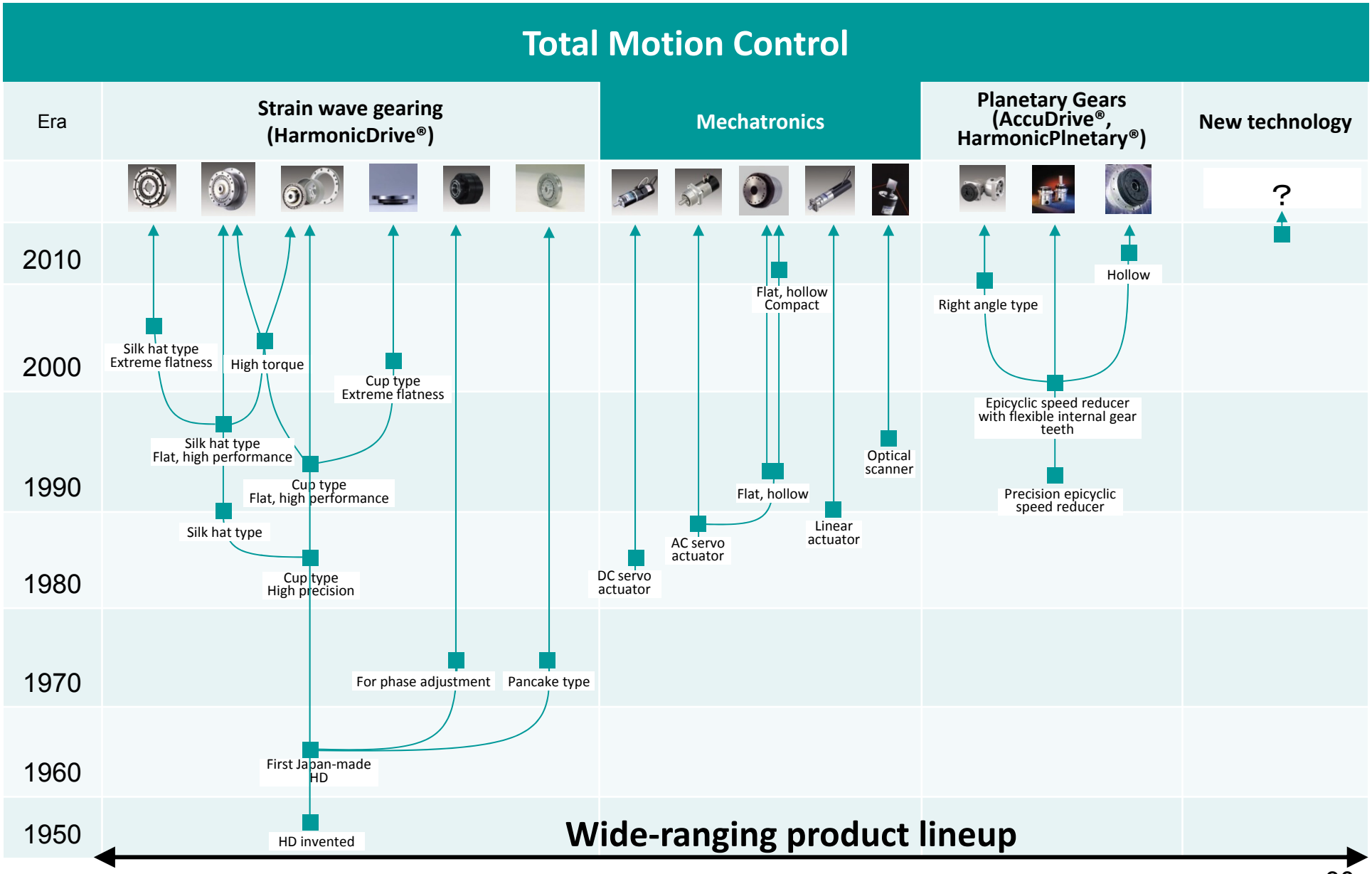


co-bots Market Growth Forecast

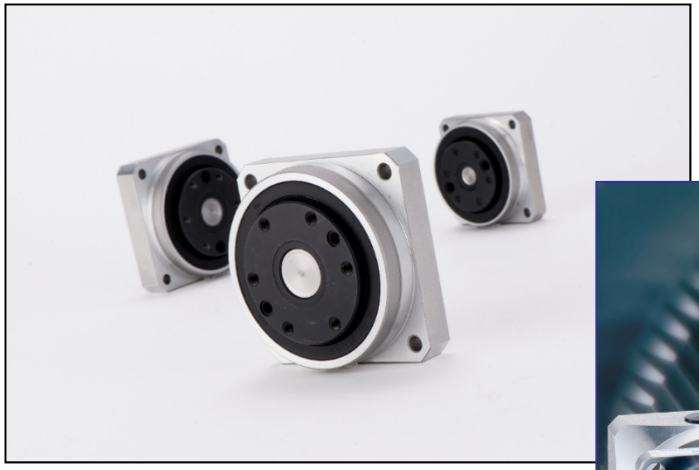


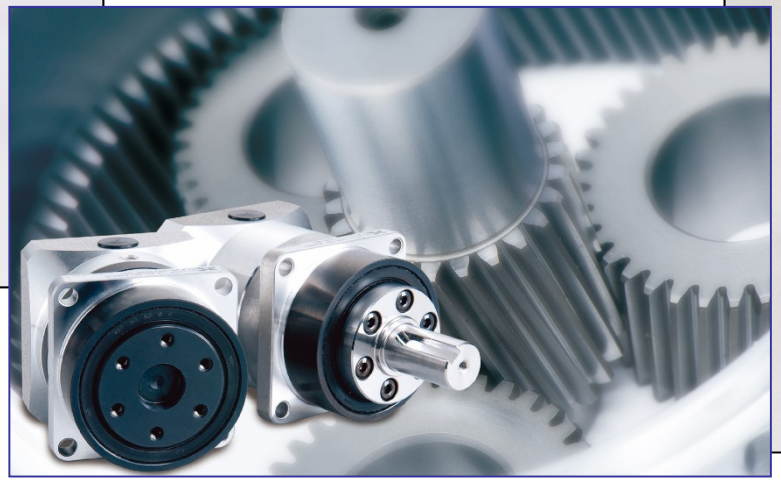
From Barclays report

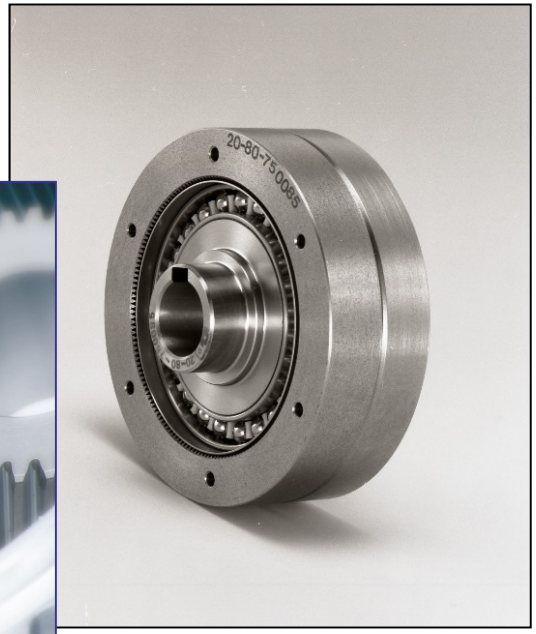
Lineage of New Product Development



New Products: Environment of existing products and aims





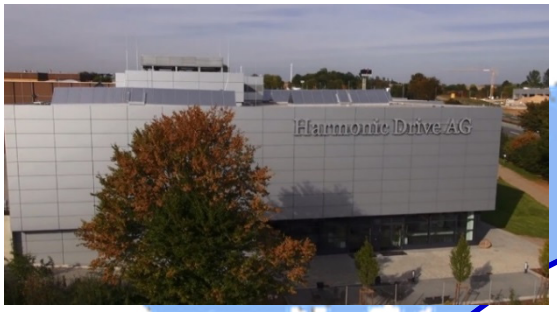


Market for small, lightweight portable robots

- Collaborative robots (co-bots)
- Service robots
- AGV (Automatic Guided Vehicles)

Research and Development Enabling the Future

Germany
Harmonic Drive AG



US
Harmonic Drive LLC

Basic research

Materials development

Production technology development

Durability testing

Boosting Collaboration

Collaboration with other companies

MITSUBISHI ELECTRIC 三菱電機
Changes for the Better

2013.6
Mitsubishi Electric
MELSERVO J4 + SHA-M

Panasonic

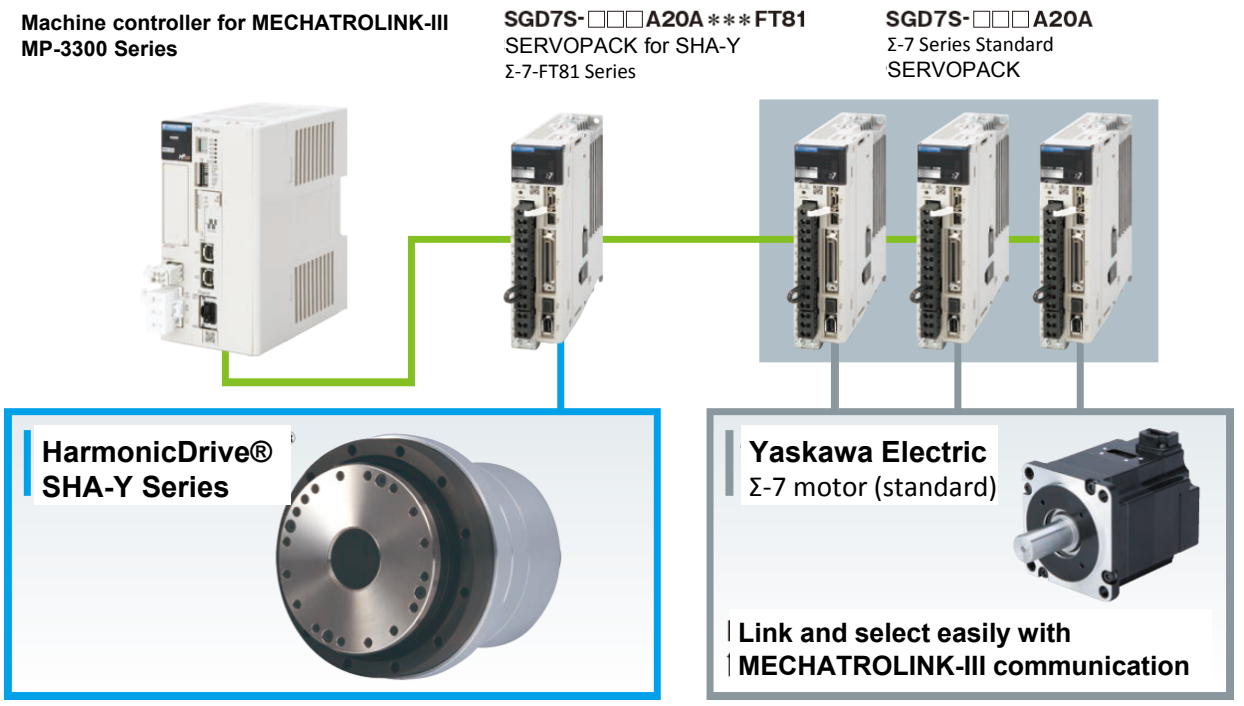
2014.7
Panasonic
MINASA5 II/A5 II Series + SHA-P

YASKAWA

2015.8
Yaskawa Electric
Σ-7 Series + SHA-Y

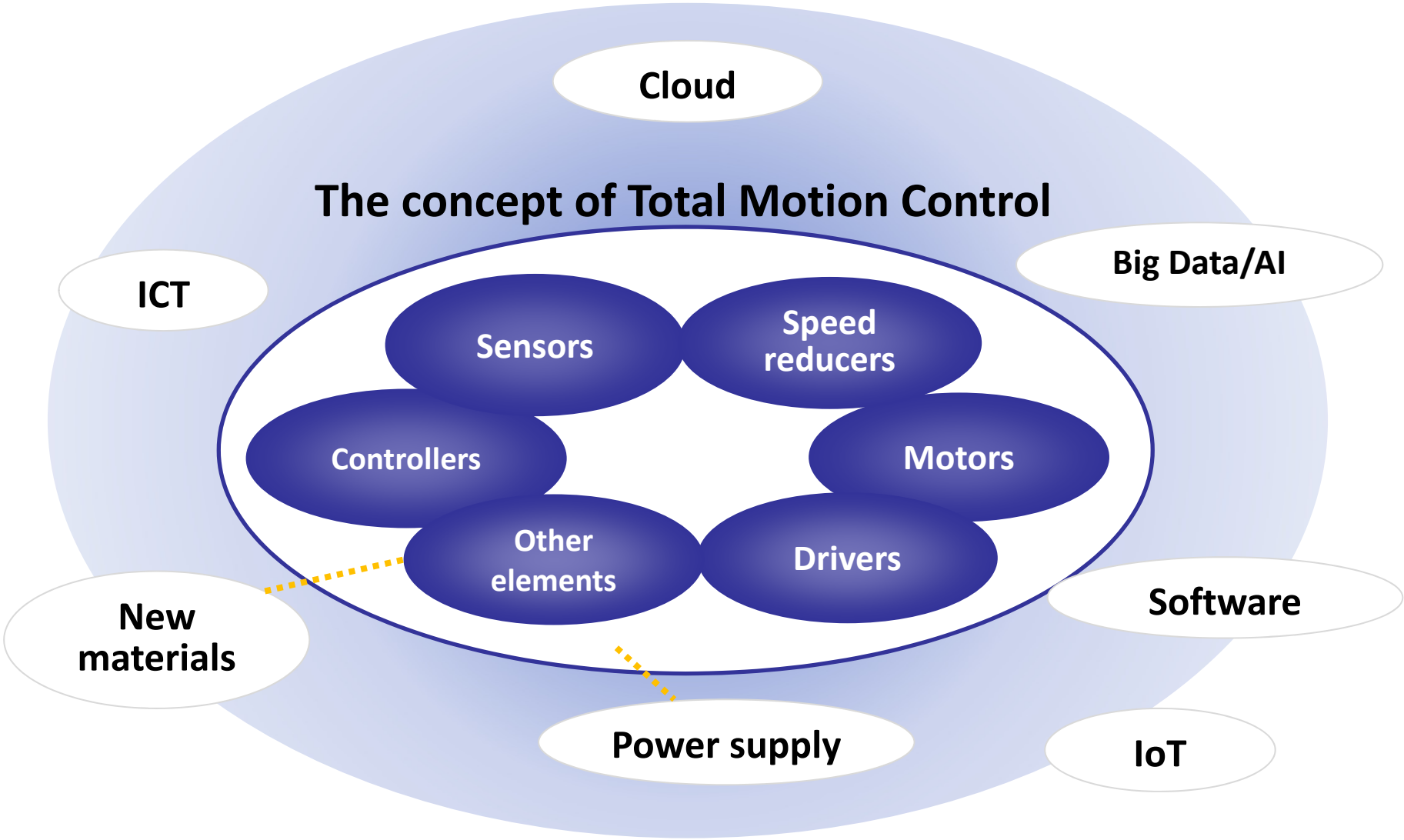
Can be combined with Σ-7 Servopack and SHA-Y

Illustration of MECHATROLINK-III System



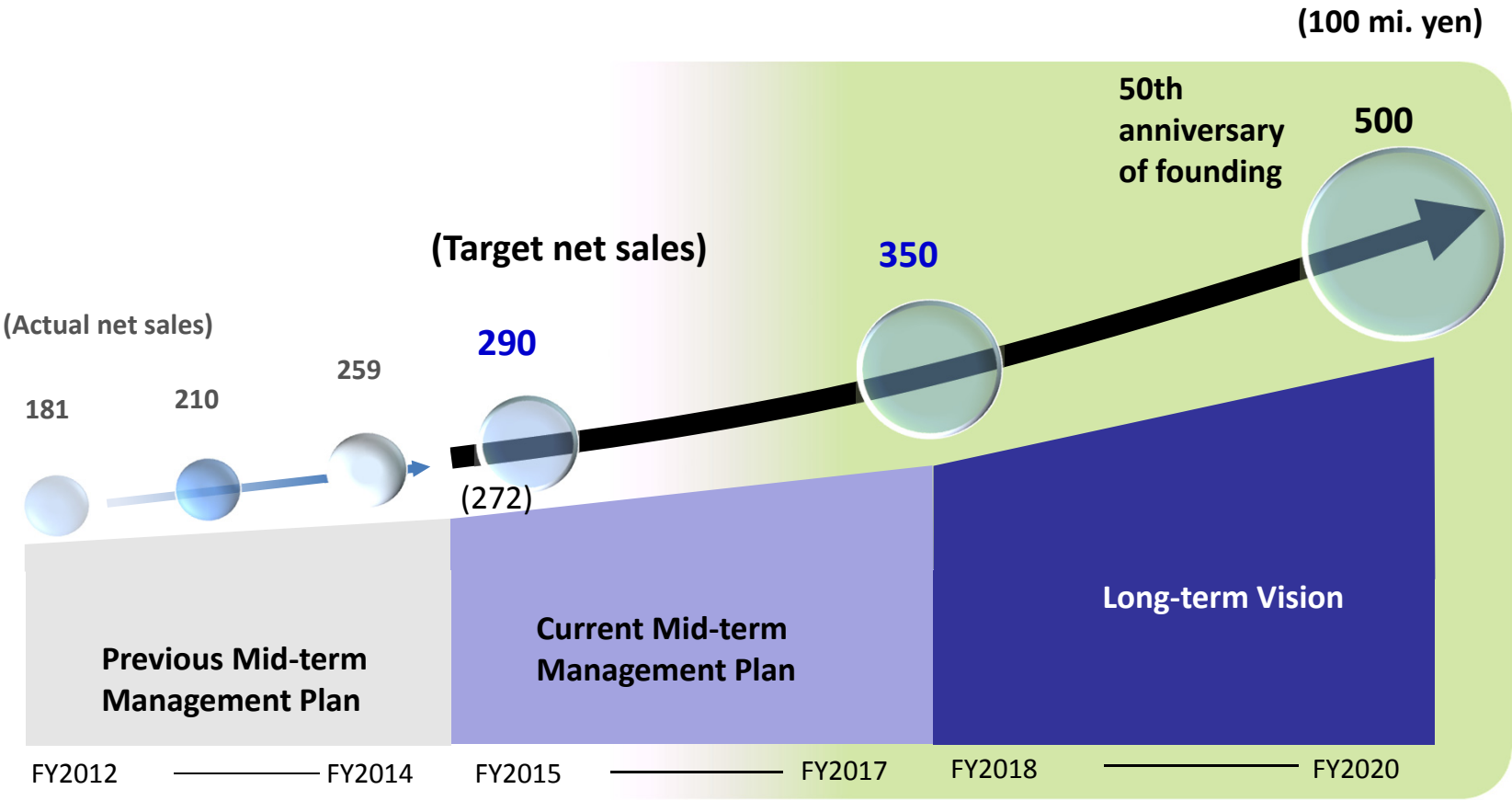
Rotation accuracy similar to that of direct drive!
Incorporated readily in MECHATROLINK-III system

Total Motion Control and Relation to New Core Technologies



Visualization of Growth Trajectory

On to a new growth stage



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 and Finance 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/