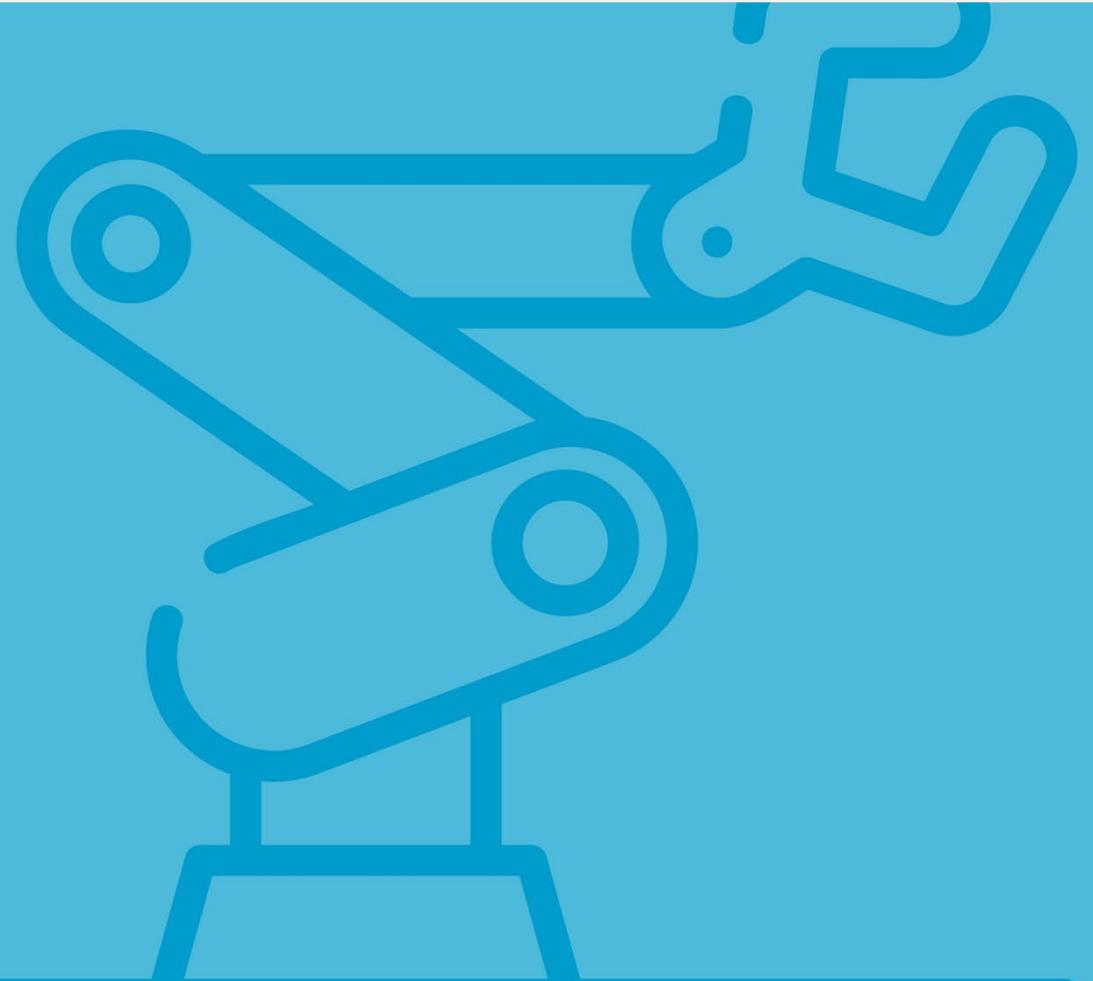


Welcome to the presentation of

World Robotics 2024



The Speakers



Marina Bill
IFR President

Global Head Marketing
& Sales, ABB Robotics



Dr. Christopher Müller
Director Statistical Dpt.

International Federation
of Robotics



Dr. Werner Kraus
Chair IFR Service Robot
Group

Head of Research
Divison Automation &
Robotics, Fraunhofer
IPA



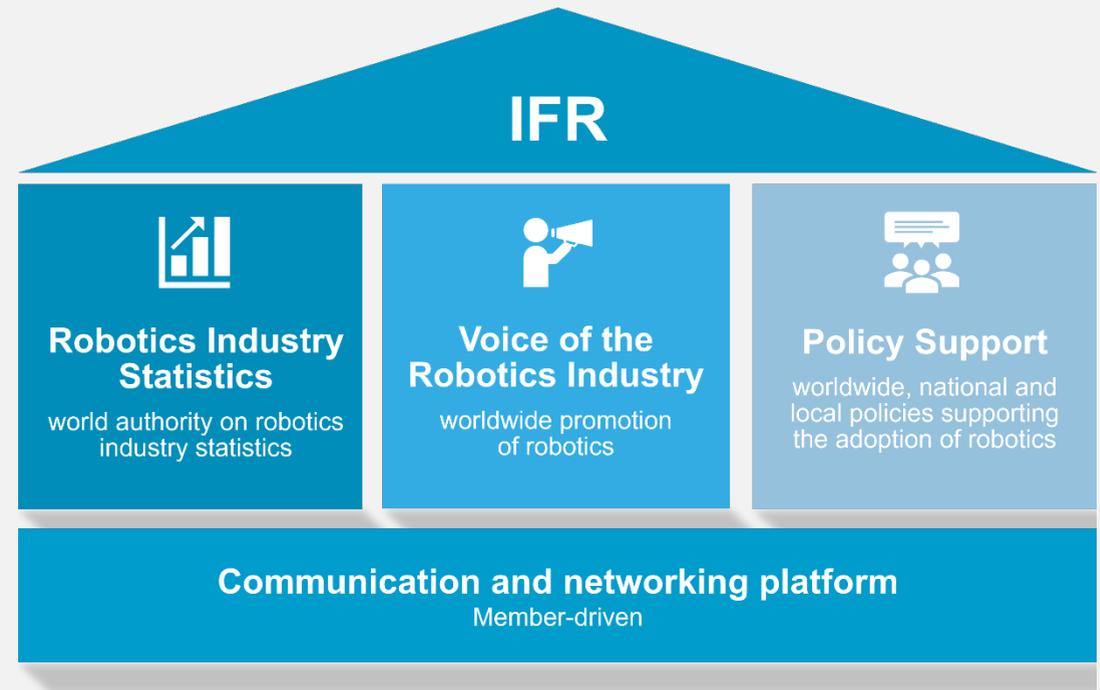
Dr. Susanne Bieller
General Secretary

International Federation
of Robotics

International Federation of Robotics

Who we are

- Professional **non-profit organization**
- **Established in 1987**
- Over **3000 organizations** represented
- **About 90 members**
 - National **robotics associations, R&D institutes, robot suppliers, integrators**
- **Communication and networking platform**



Our members

NATIONAL ASSOCIATIONS



INDUSTRIAL ROBOT MANUFACTURERS



SERVICE ROBOT MANUFACTURERS



COMPONENT SUPPLIERS & INTEGRATORS



R&D INSTITUTES



What is a robot – and what is not?



- **“Robot”** defined by **International Standards Organization ISO**
- **No robots:**
 - ⊗ software (“bots”, AI, Robotic Process Automation -RPA)
 - ⊗ remote-controlled drones, UAV, UGV, UUV
 - ⊗ voice assistants
 - ⊗ autonomous cars
 - ⊗ ATMs, smart washing machines, etc.

Two reports

Industrial robots



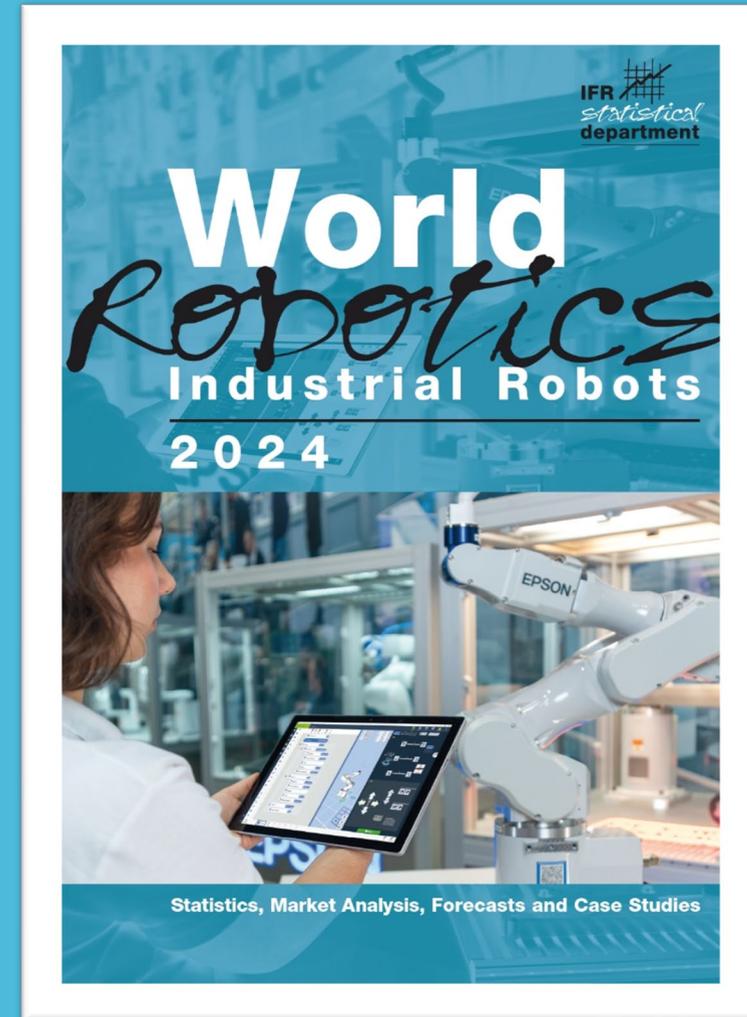
Source: Epson

Service, mobile and medical robots

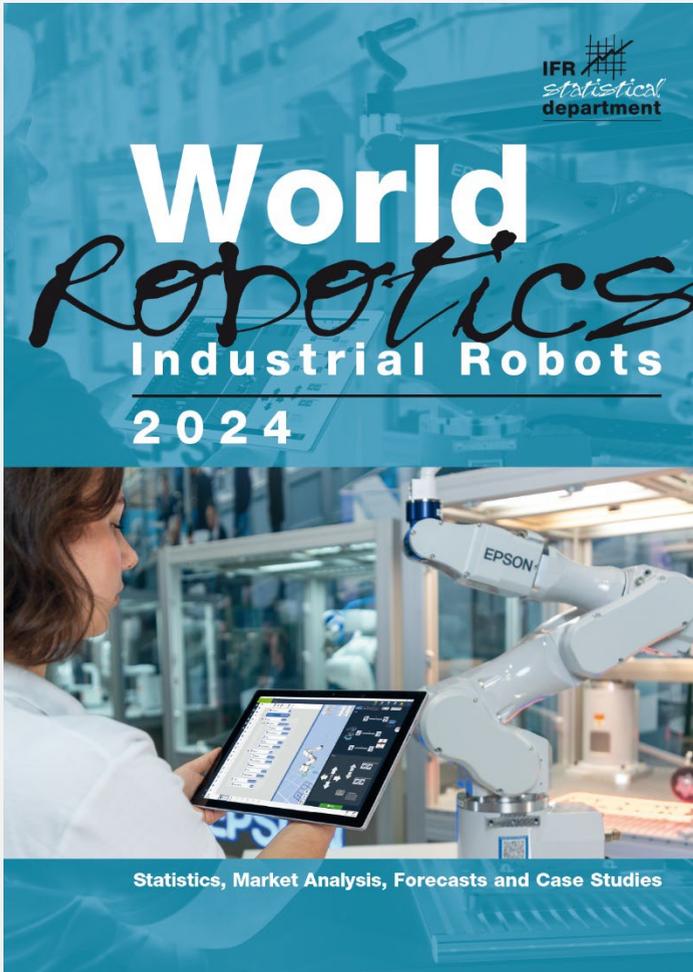


Source: Staubli

Presentation of World Robotics 2024



Industrial robots - top findings



2023: Second highest installation count in history

- Annual installations exceeded 500,000 units for the third consecutive year.

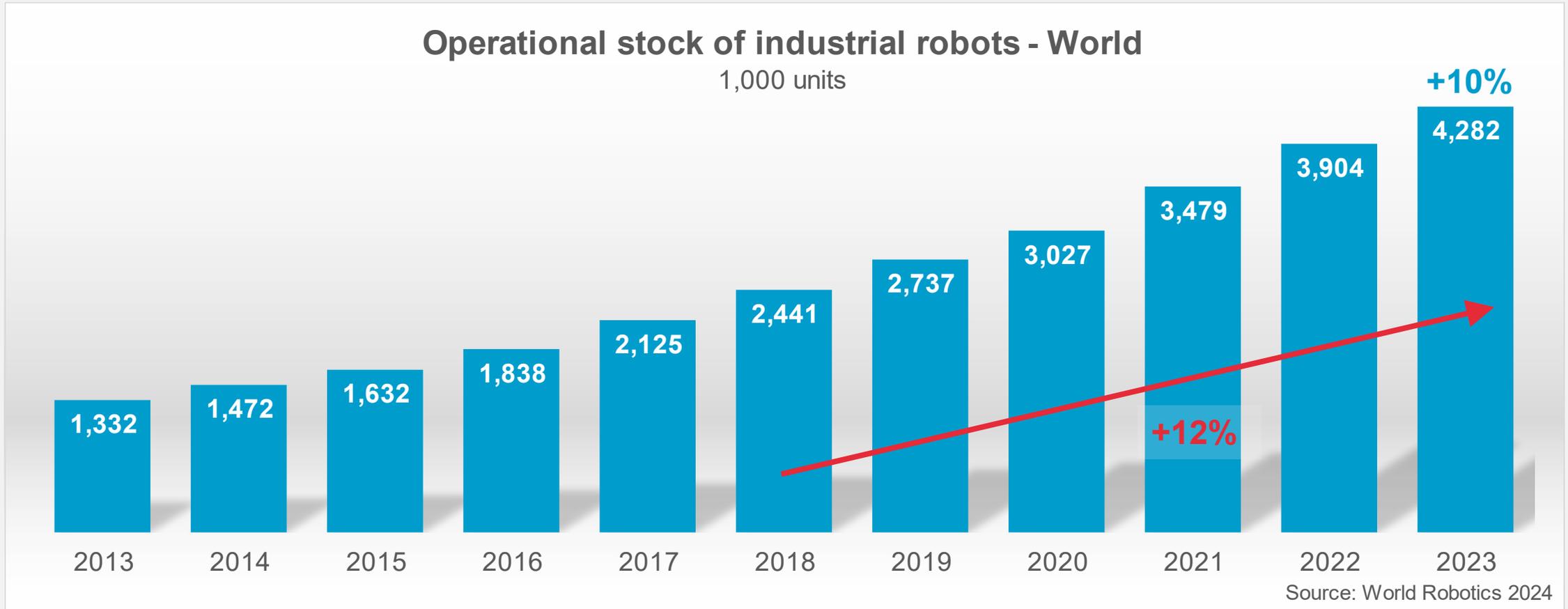
New robots

- 541,000 units (-2%)
- CAGR 2018-2023: +5%

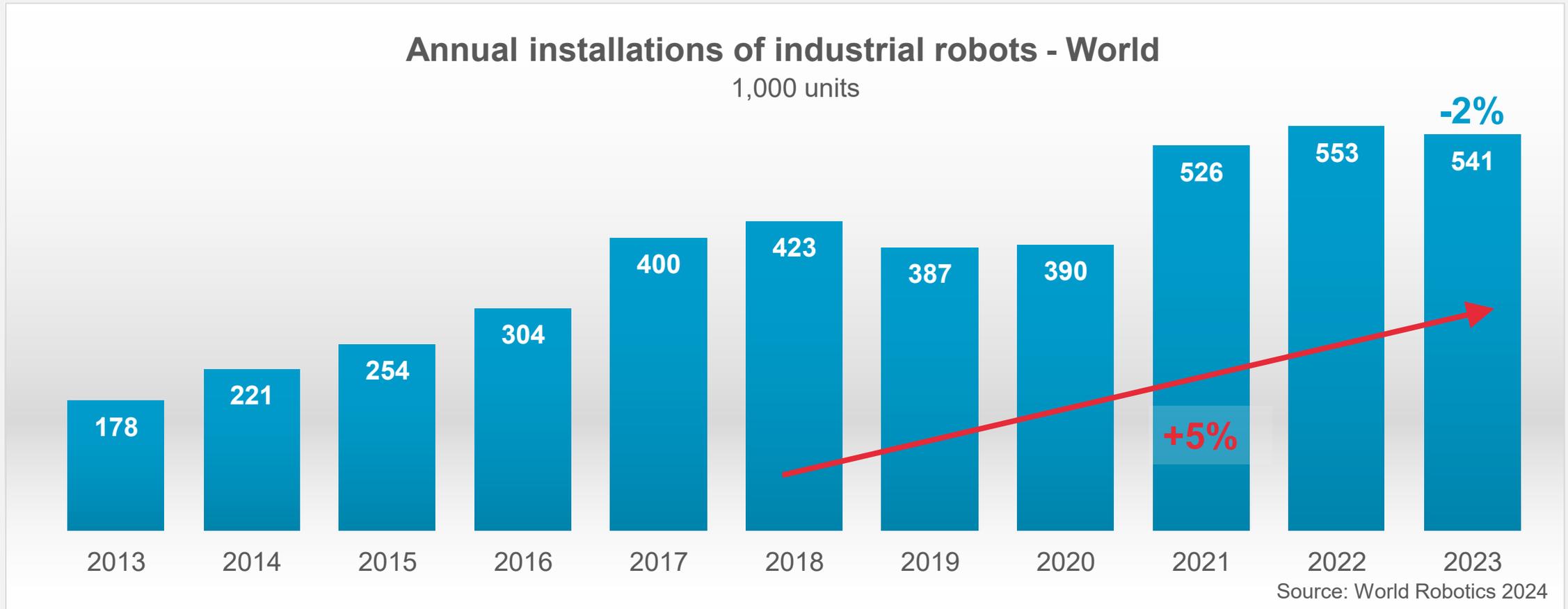
Robot stock

- 4.3 million units (+10%)
- CAGR 2018-2023: +12%

More than 4 million industrial robots operating around the world



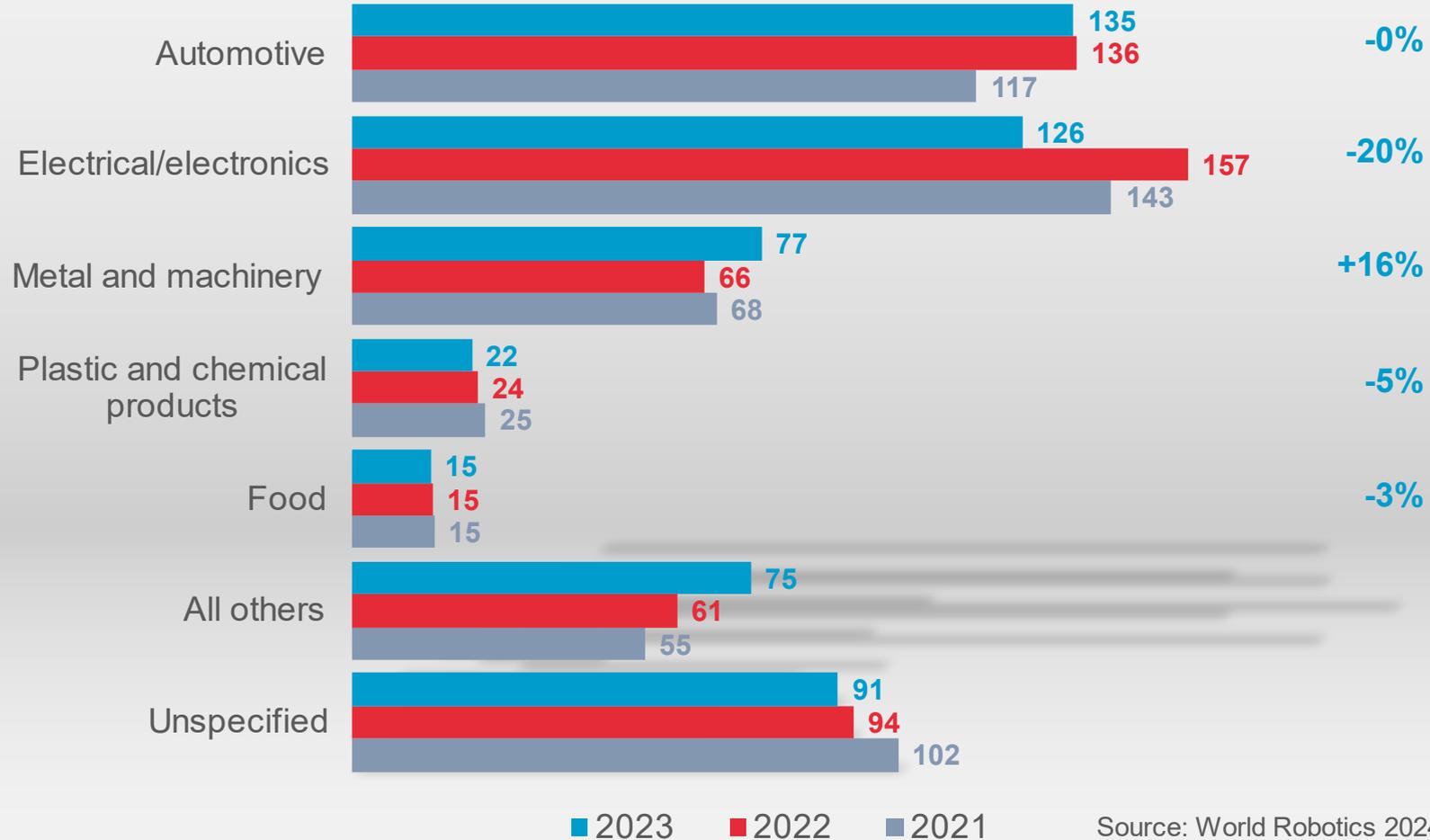
Annual installations exceeded 500,000 units for the third consecutive year



Automotive main customer due to weak demand from electronics

Annual installations of industrial robots by customer industry- World

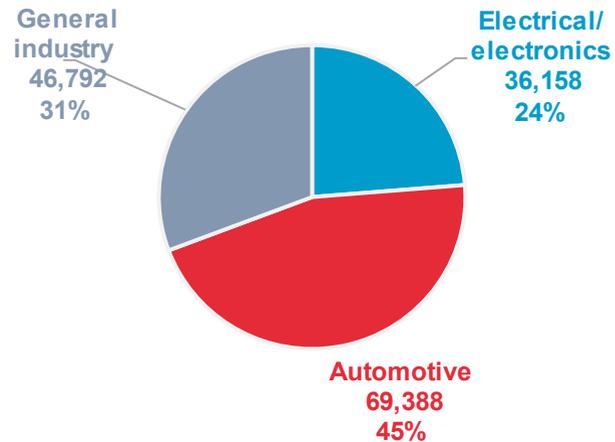
1,000 units



General industries are growing their market share

Shares of majors industries in 2013

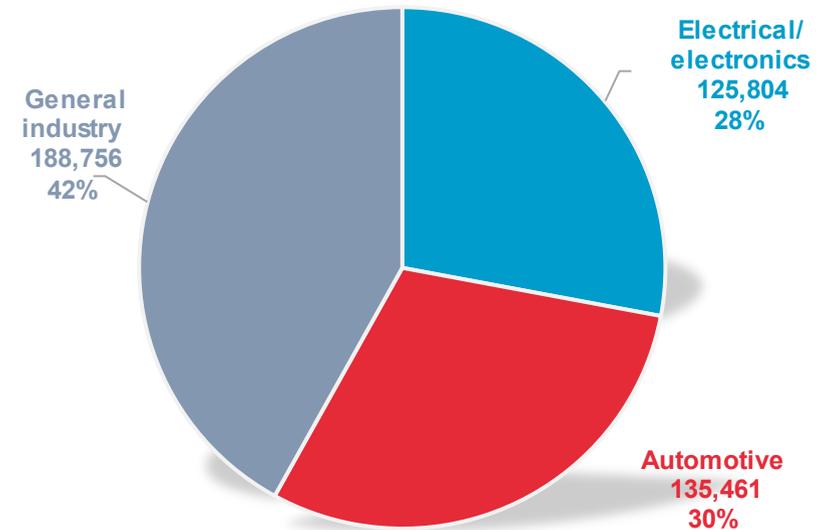
Annual installations of industrial robots: automotive and electronics vs. general industry - 2013 - World



Source: International Federation of Robotics

Shares of majors industries in 2023

Annual installations of industrial robots: automotive and electronics vs. general industry - 2023 - World

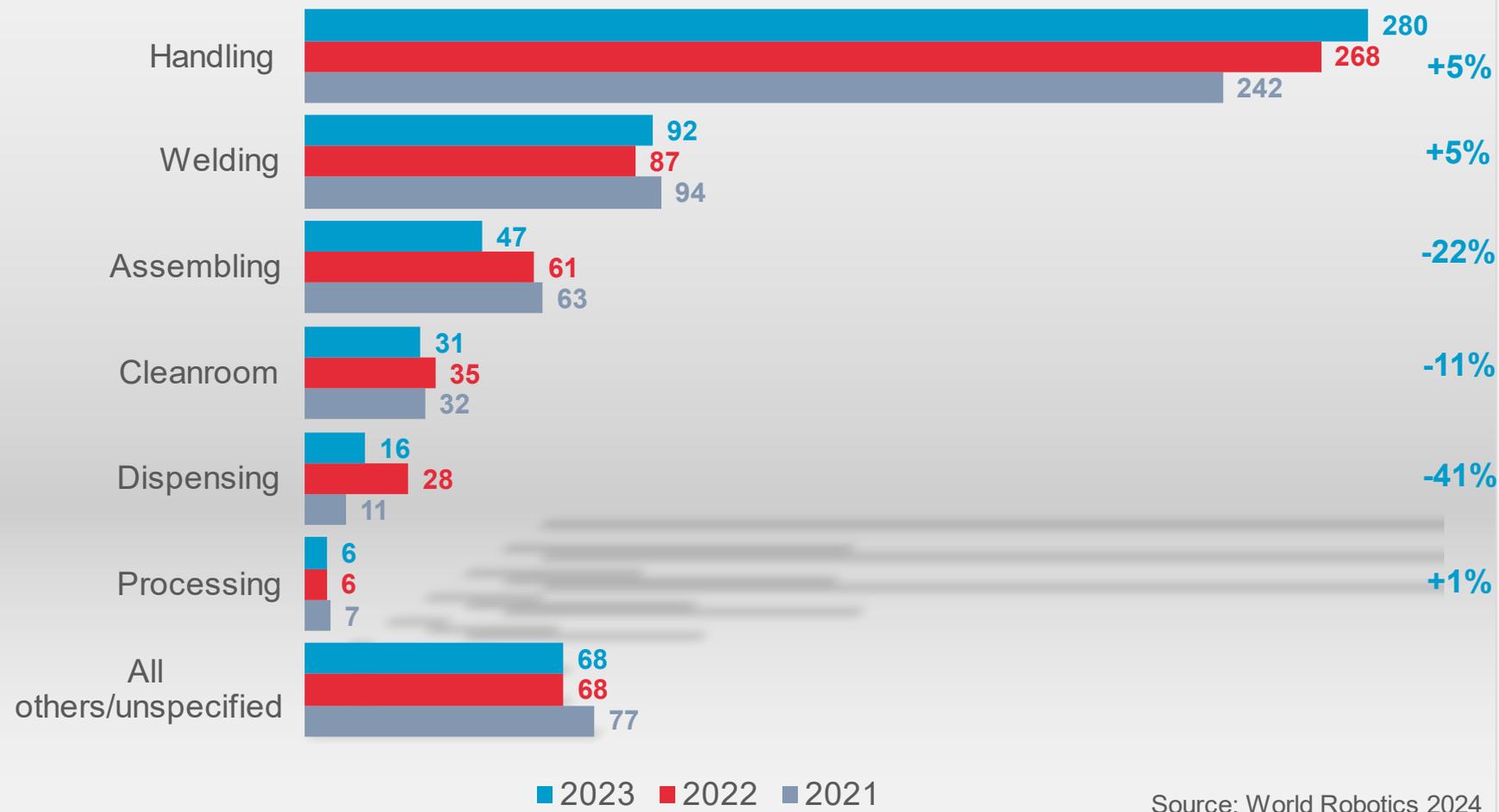


Source: International Federation of Robotics

Handling by far the largest application

Annual installations of industrial robots by application- World

1,000 units

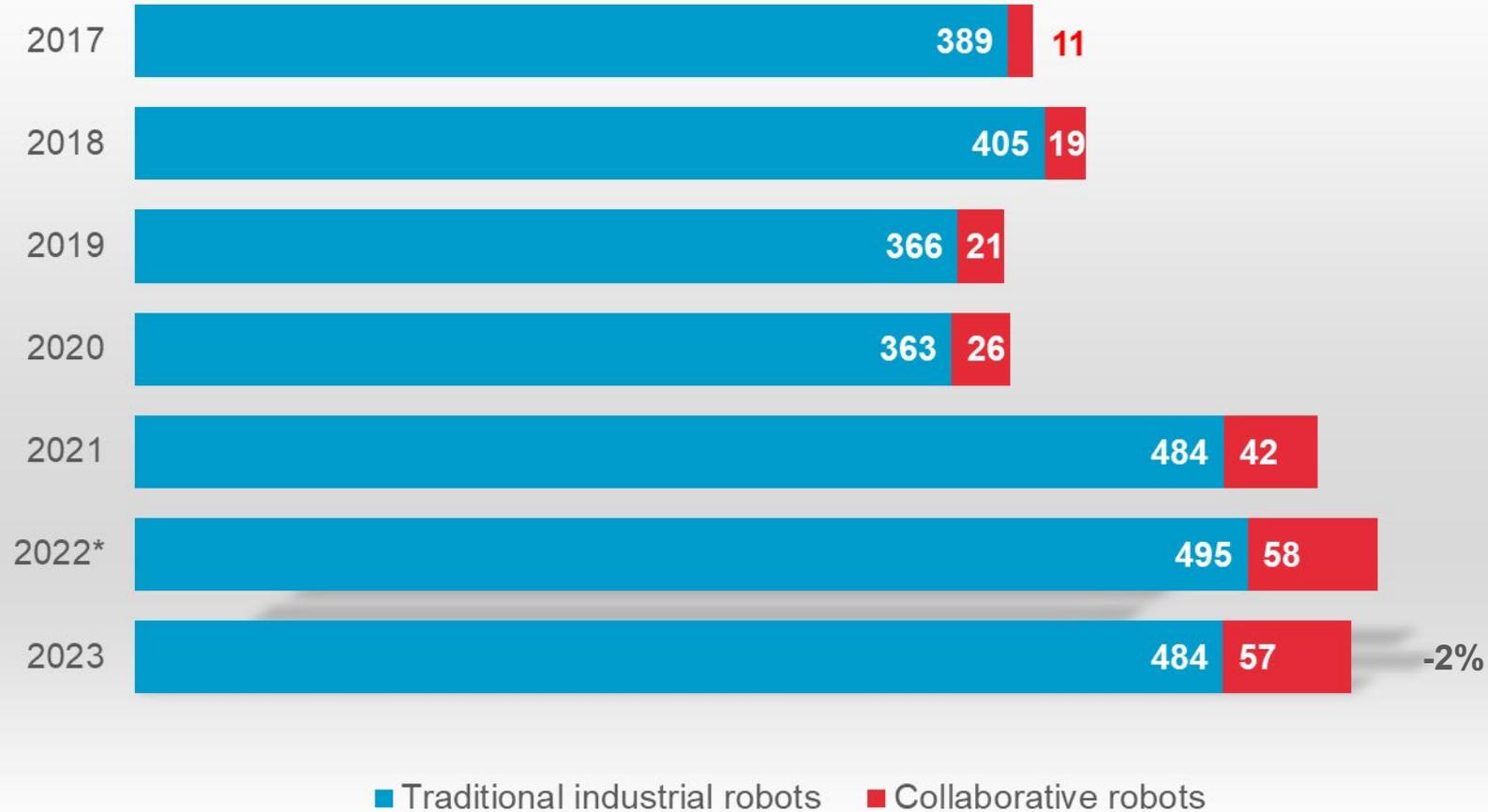


Source: World Robotics 2024

Collaborative robot installations declining for the first time

Collaborative and traditional industrial robots

'000 units

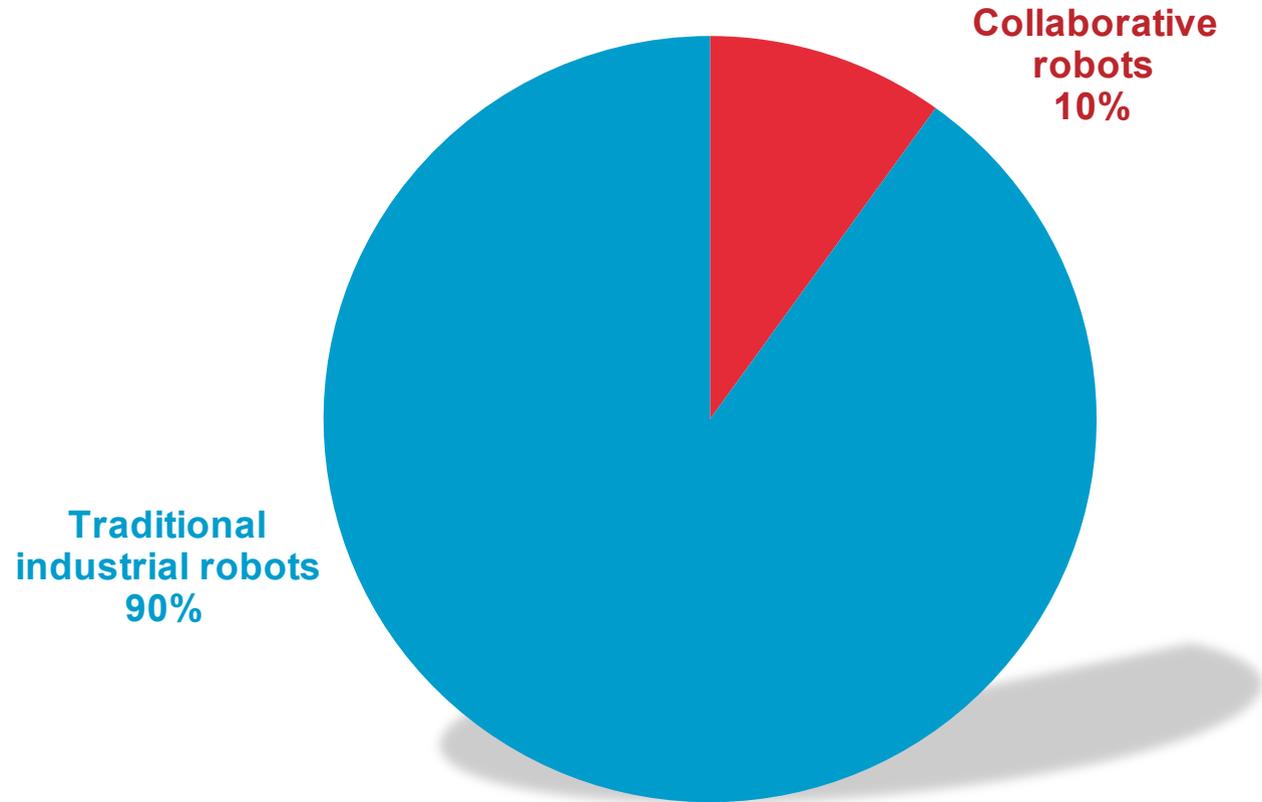


*revised

Source: International Federation of Robotics

Collaborative robots share remains at 10%

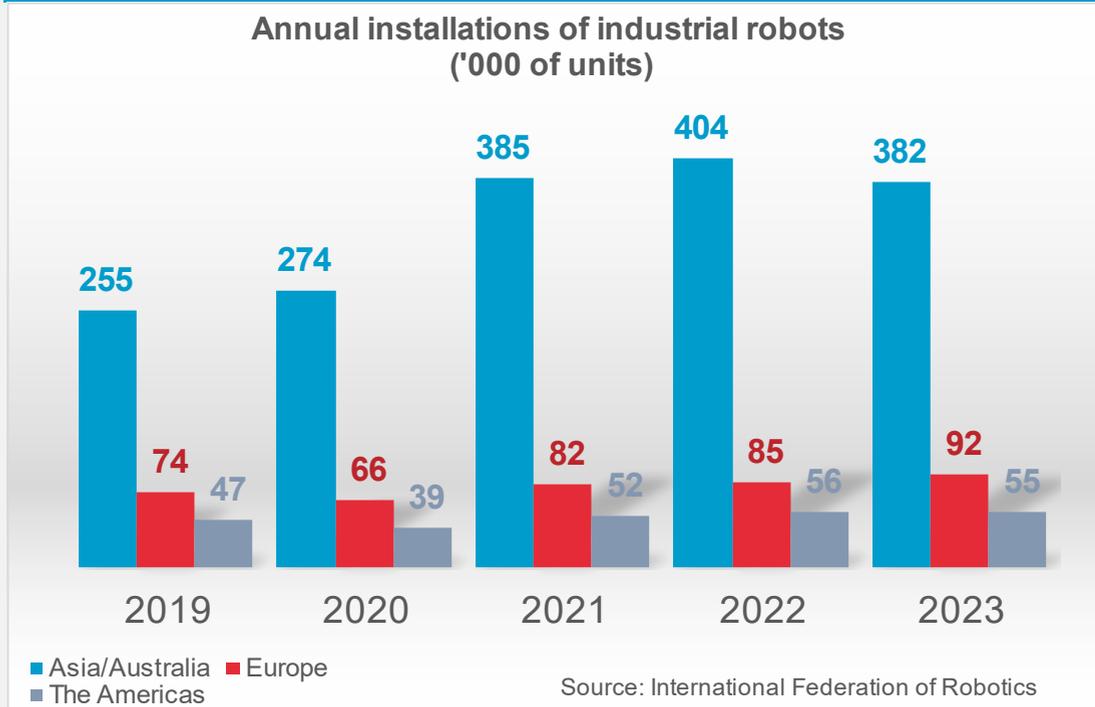
**Shares of collaborative vs. traditional industrial robots
2023**



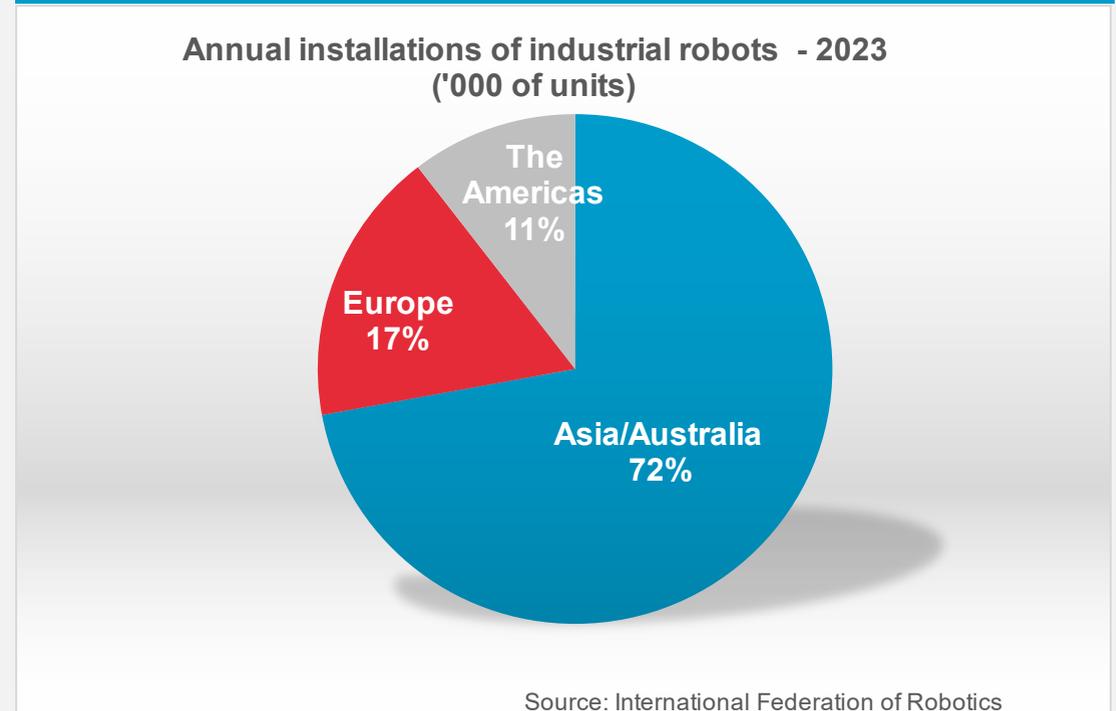
Source: International Federation of Robotics

Growth in Europe

Annual installations per region

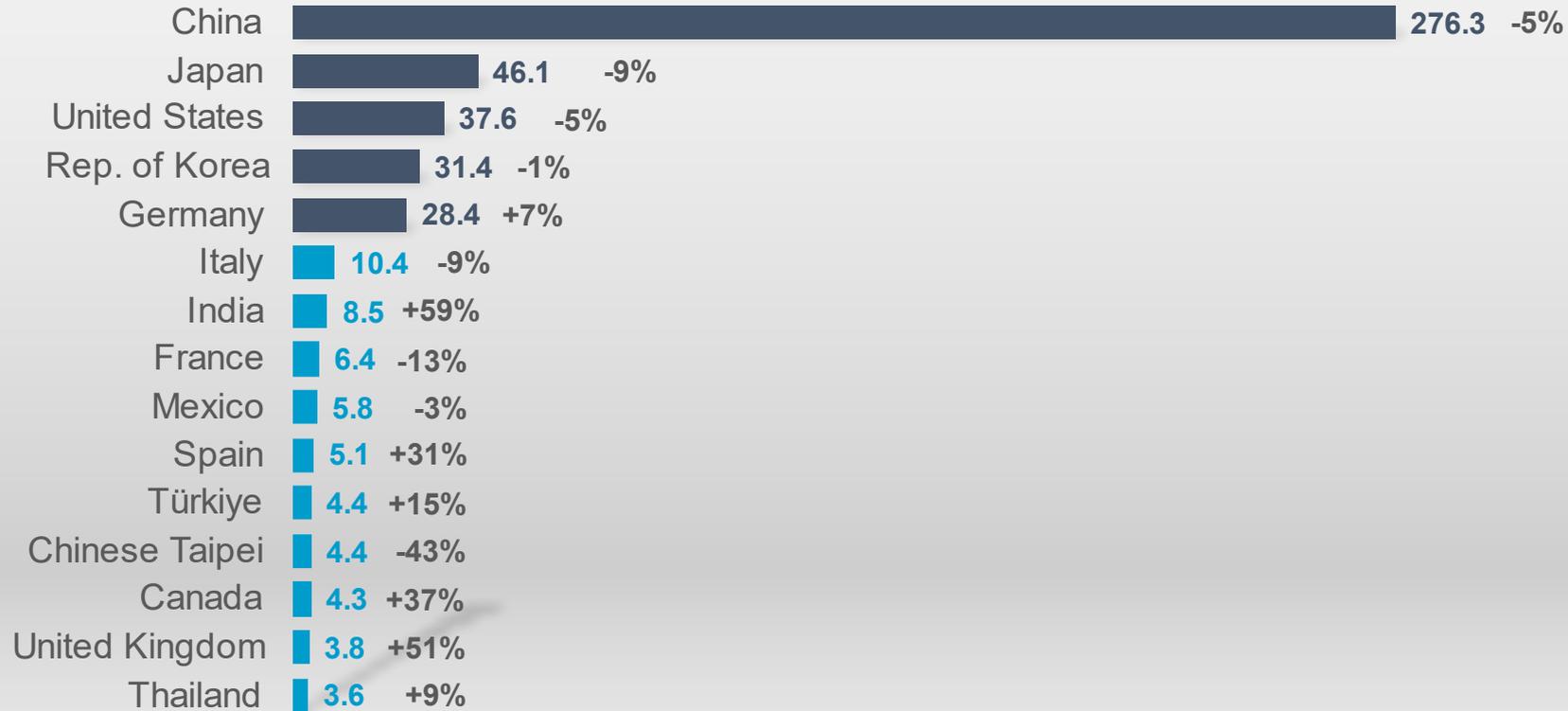


Shares of regions



China installs every other robot

Annual installations of industrial robots 15 largest markets 2023



51% in China

79% in the
top 5 markets

'000 of units

Source: World Robotics 2024

Growth in China comparable to global growth

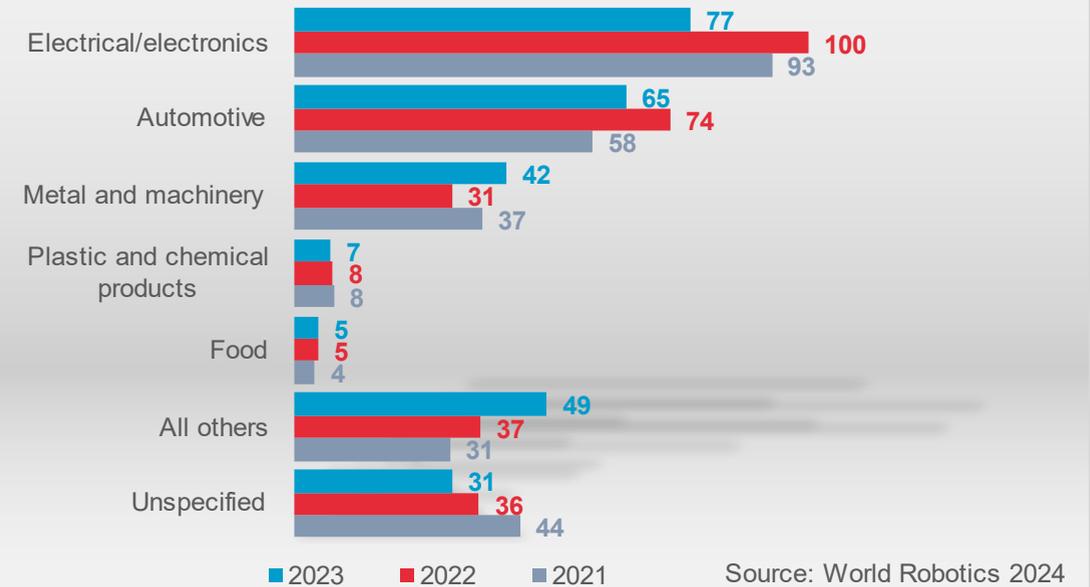
Share of Chinese suppliers at 47%

Annual installations of industrial robots - China
1,000 units



Electronics main customer industry in China

Annual installations of industrial robots by customer industry - China
1,000 units



Japan seeking new impetus

Installations level out at 46 thousand units

Annual installations of industrial robots - Japan

1,000 units

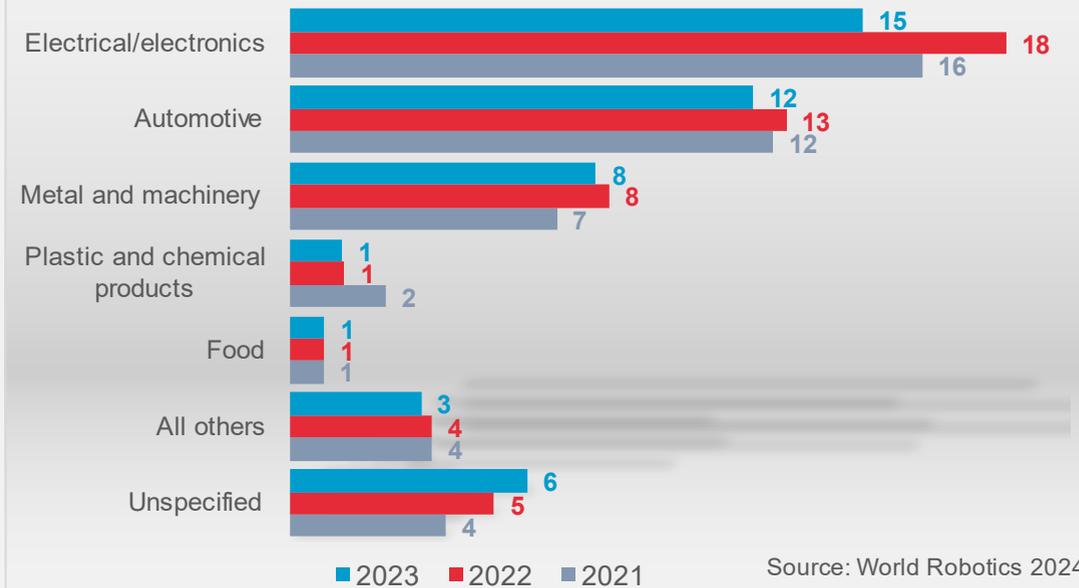


Source: World Robotics 2024

Electronics and automotive industry decline

Annual installations of industrial robots by customer industry - Japan

1,000 units



Source: World Robotics 2024

US installations remain high

United States: Third highest level ever recorded

Annual installations of industrial robots - United States

1,000 units

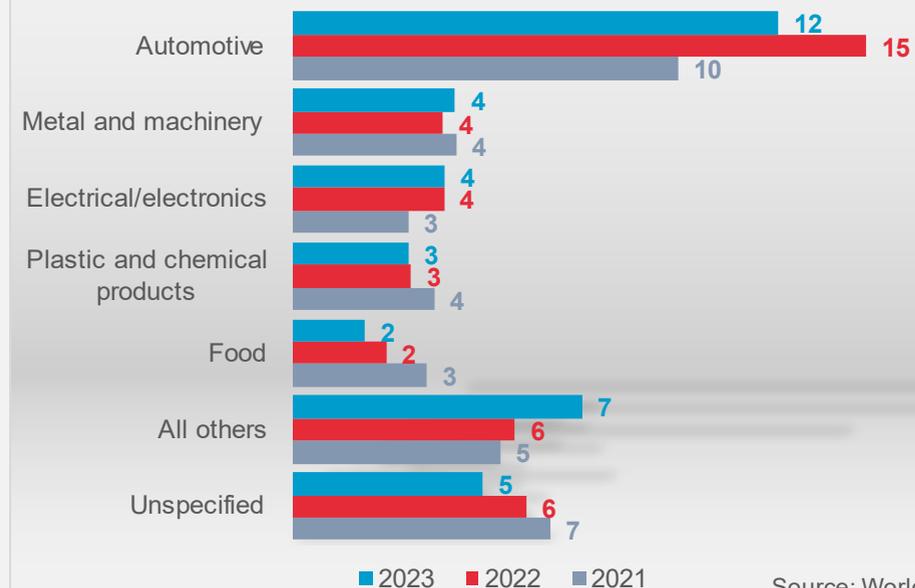


Source: World Robotics 2024

US Automotive Industry installs fewer robots

Annual installations of industrial robots by customer industry United States

1,000 units



Source: World Robotics 2024

Korea: moving sideways

Korean robot demand moving sideways

Annual installations of industrial robots - Rep. of Korea

1,000 units



Source: World Robotics 2024

Korean electronics industry down 9%

Annual installations of industrial robots by customer industry - Rep. of Korea
units

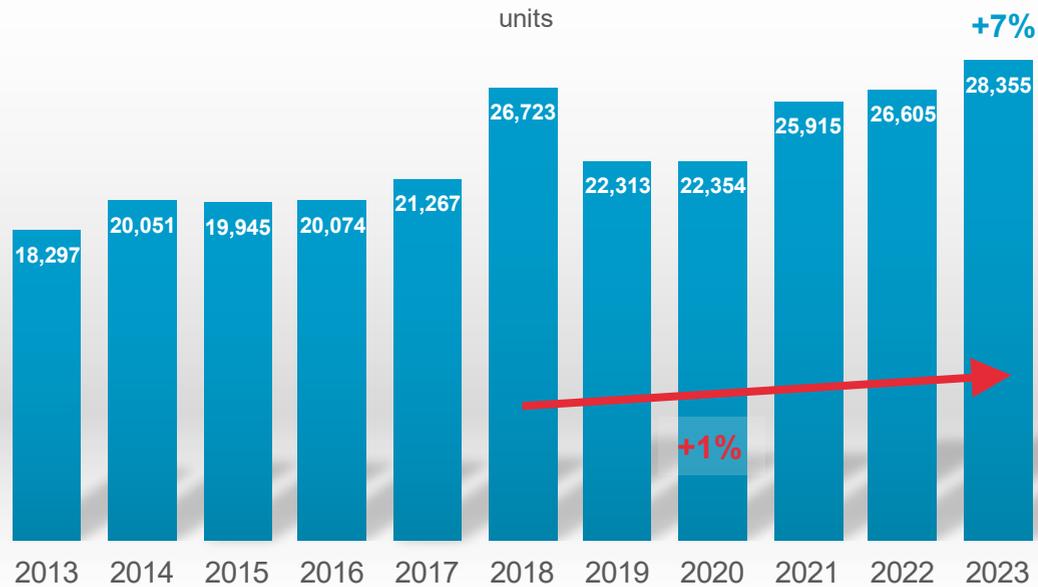


Source: World Robotics 2024

Germany: Automotive back on growth track

Germany growing

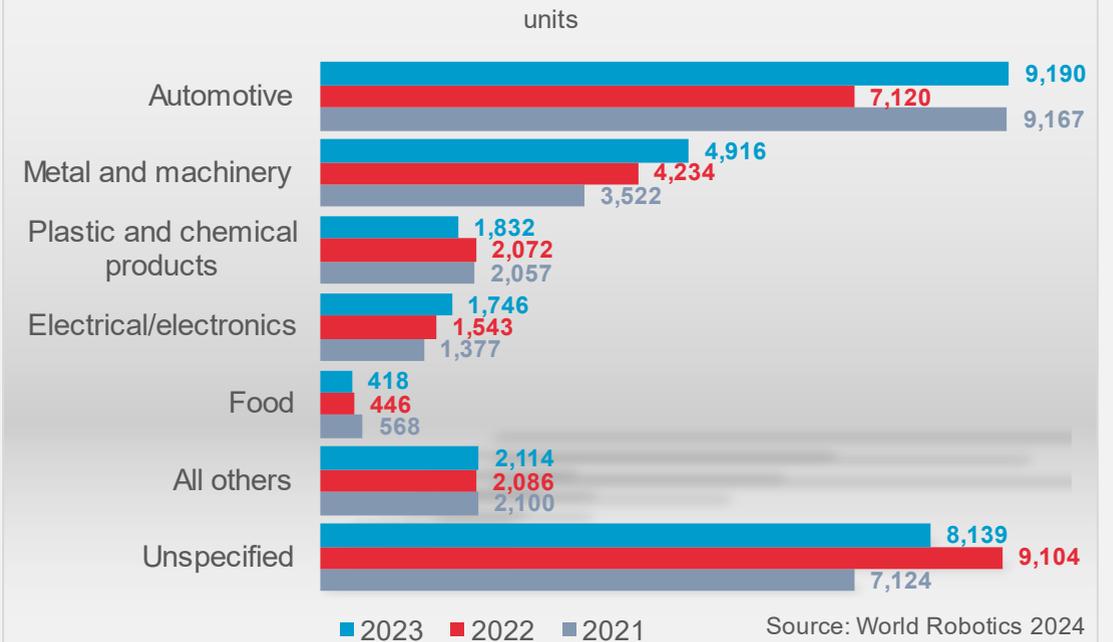
Annual installations of industrial robots - Germany



Source: World Robotics 2024

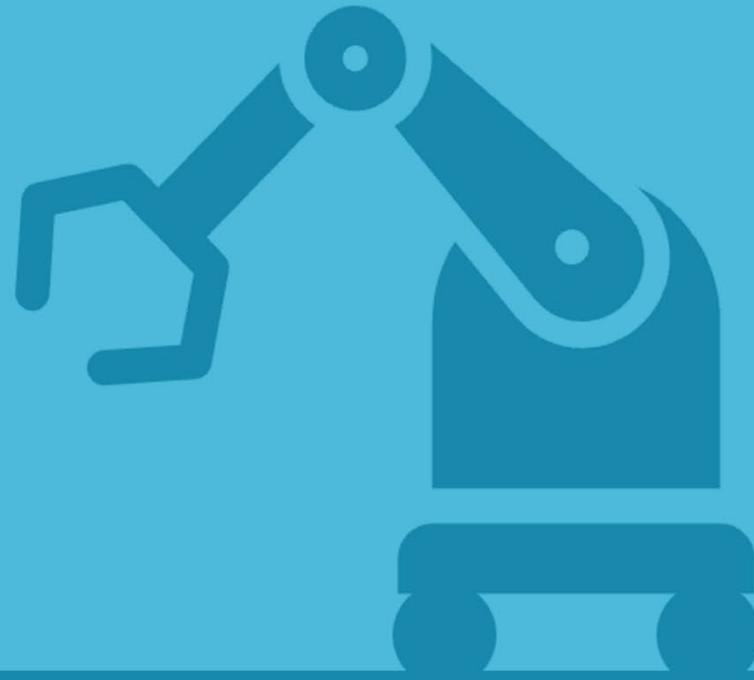
Growth in automotive and in metal/machinery

Annual installations of industrial robots by customer industry - Germany



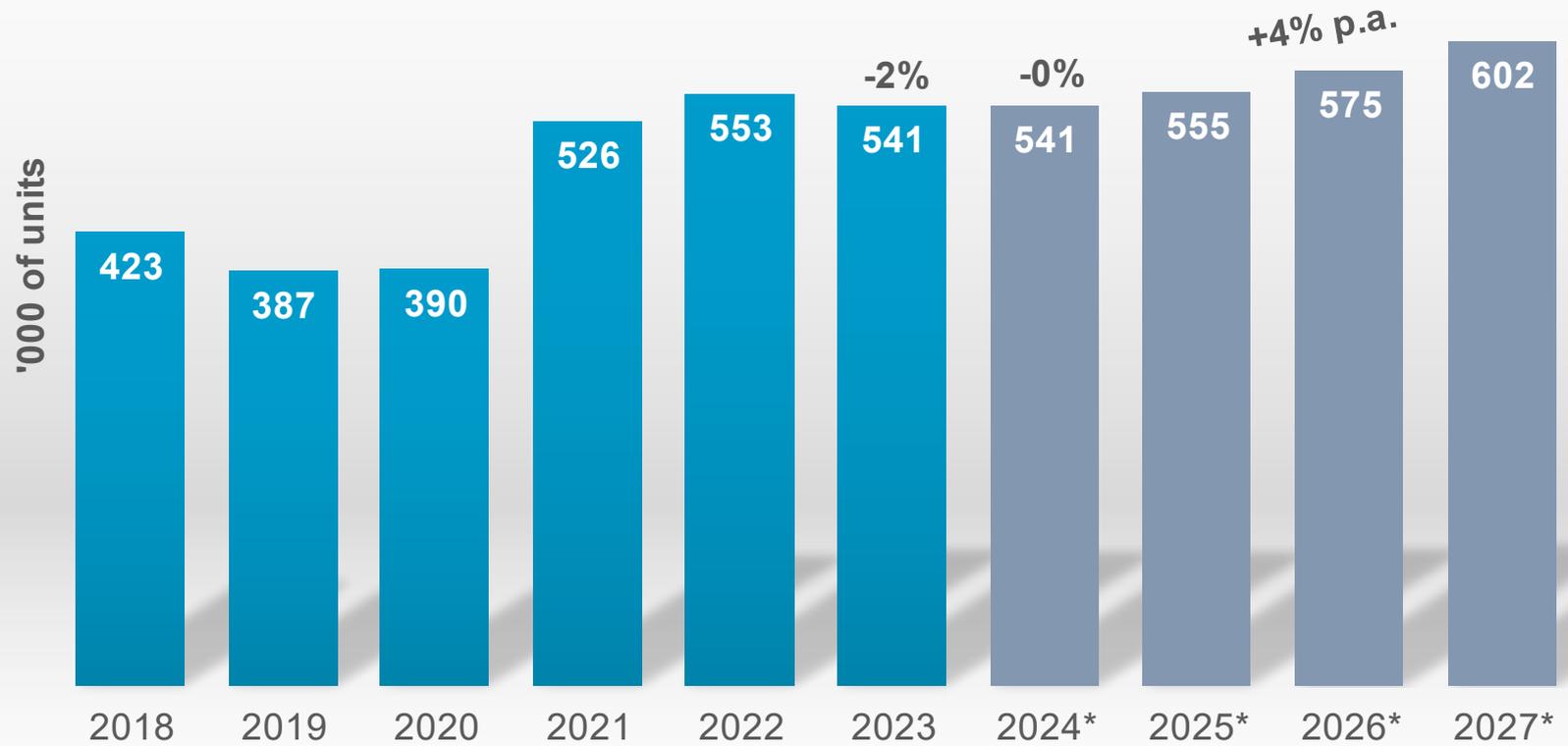
Source: World Robotics 2024

Trends and Forecast



Sideways movement for 2024 expected

Annual installations of industrial robots 2018 -2023 and 2024*-2027*

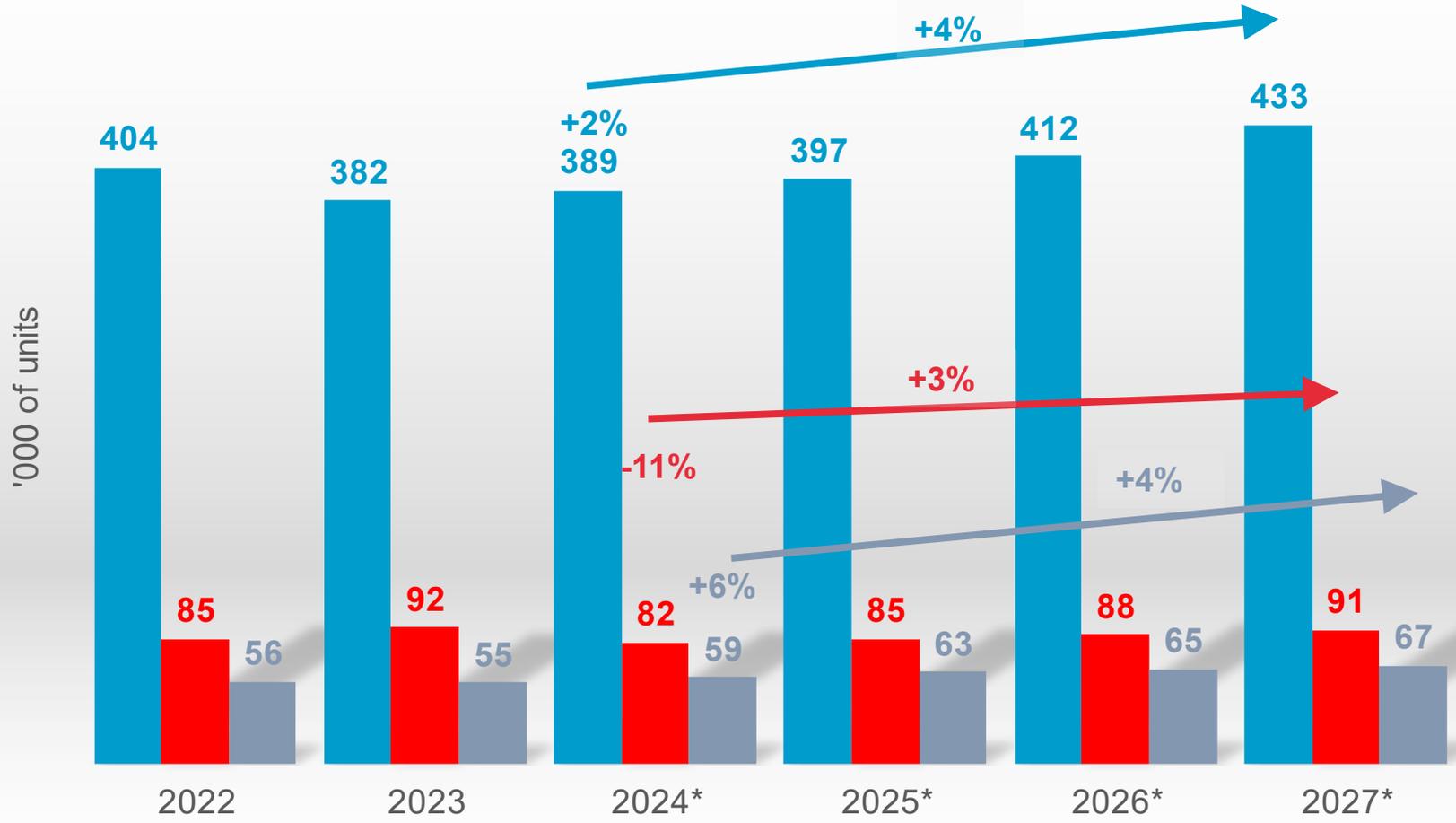


*forecast

Source: World Robotics 2024

Forecast

Annual installations of industrial robots 2022 -2023 and 2024*-2027*



*forecast

■ Asia/Australia ■ Europe ■ The Americas

Source: World Robotics 2024

Short-term market determinants

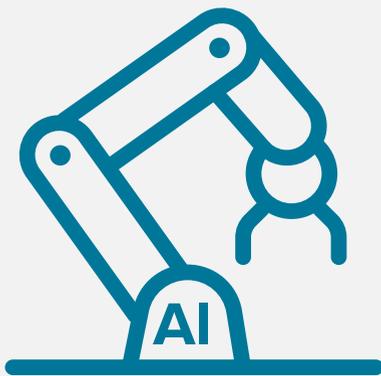


- Various **headwinds** retain investments
- Expected **rebound** of demand from the **electronics industry**
- **Global economic growth** expected to **stabilize**
- **Decrease of order intake** seems to have **bottomed out***

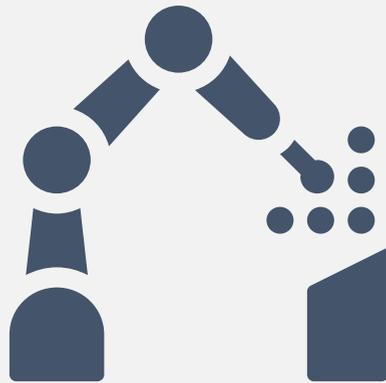
*IFR Quarterly Survey: Growth rate of order intake in currency units compared to same period last year.

TOP 5 Global Robotics Trends in 2024

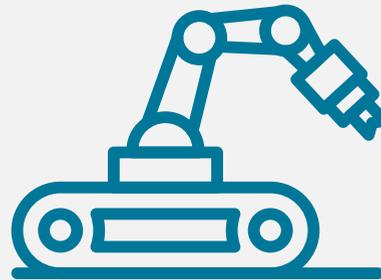
AI AND MACHINE LEARNING



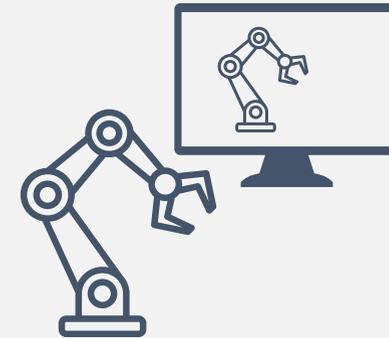
COBOTS IN NEW APPLICATIONS



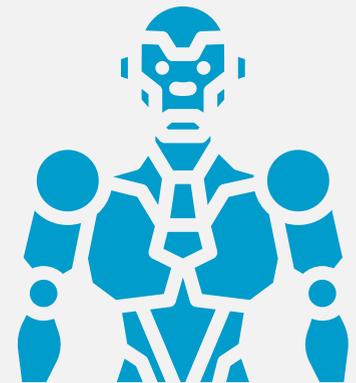
MOBILE MANIPULATORS



DIGITAL TWIN



HUMANOIDS



Technological trends



Image: PAL Robotics

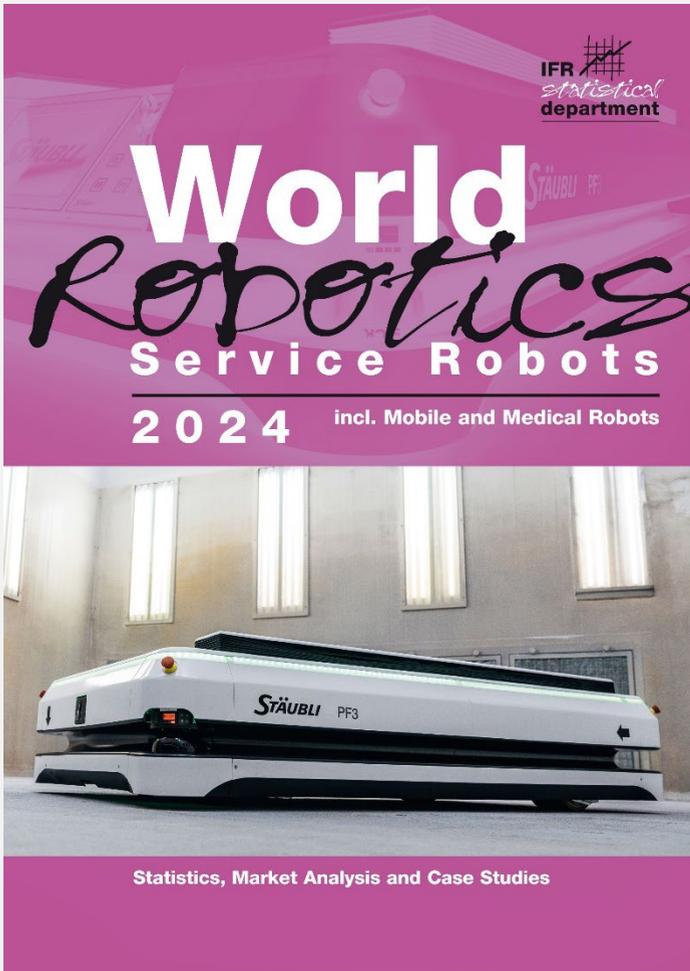
- **Mobile manipulators** offer new use cases, whenever transportation and handling tasks need to be jointly automated end-to-end in one device
- Research & development of **humanoid robots** will yield new technological capabilities
- Improvements in marketable **artificial intelligence** solutions at an incredible pace

Market trends



- **Labor scarcity** in many developed economies is driving the demand for automation
- **Reconsideration of supply chains and closeness to customers**
- **Small and medium sized enterprizes (SMEs) need easy access to automation**
 - <https://go4robotics.com/>

Service robots – top findings



2023: Continuous growth*

New professional service robots (incl. AMRs)

- 205,000 units (+30%)

New medical robots

- 6,200 units (+36%)

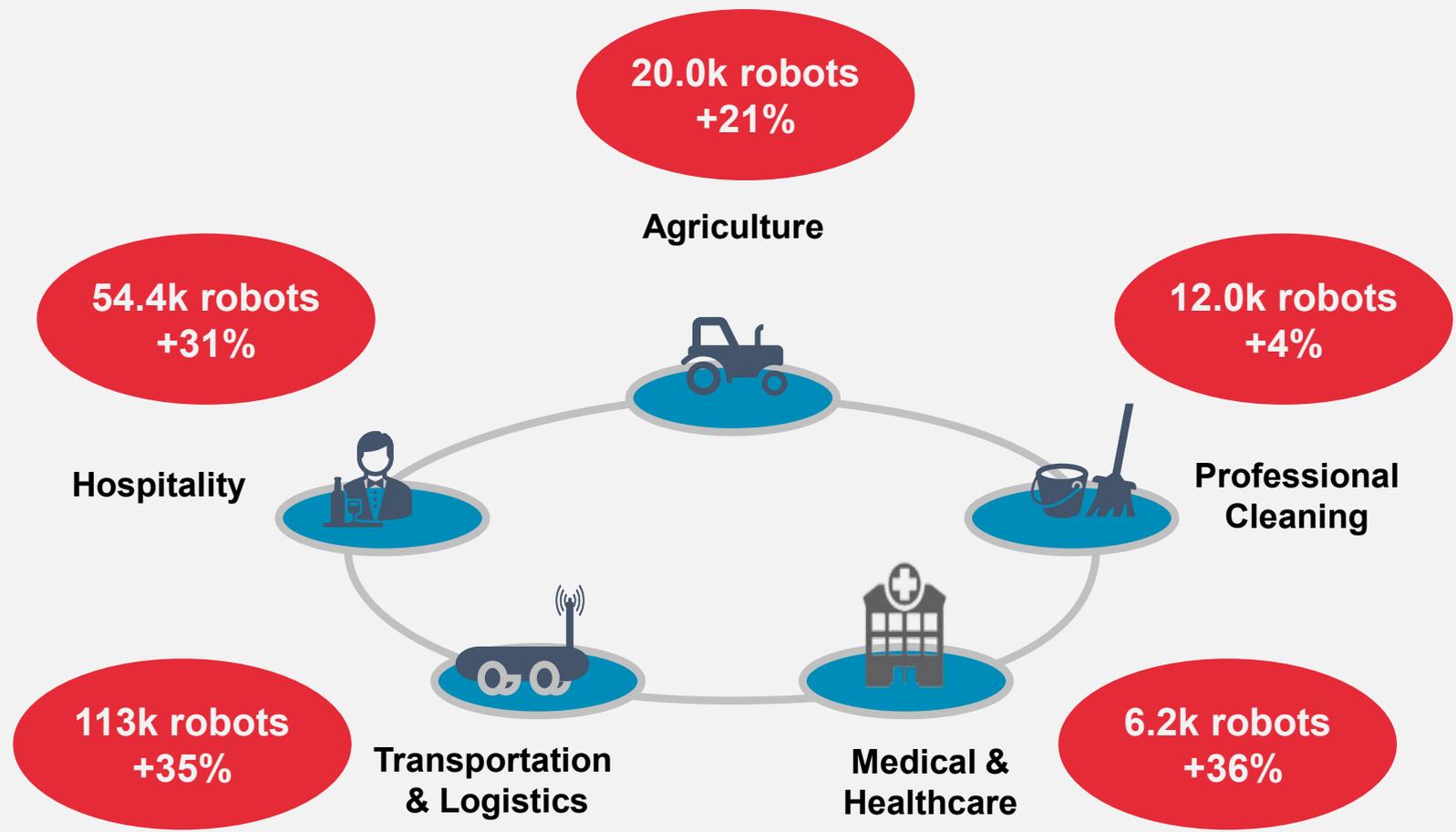
New consumer service robots

- 4.1 million units (+1%)

*All numbers based on a sample of 298 companies.
Data is not projected to the whole industry.
Sample composition varies each year.

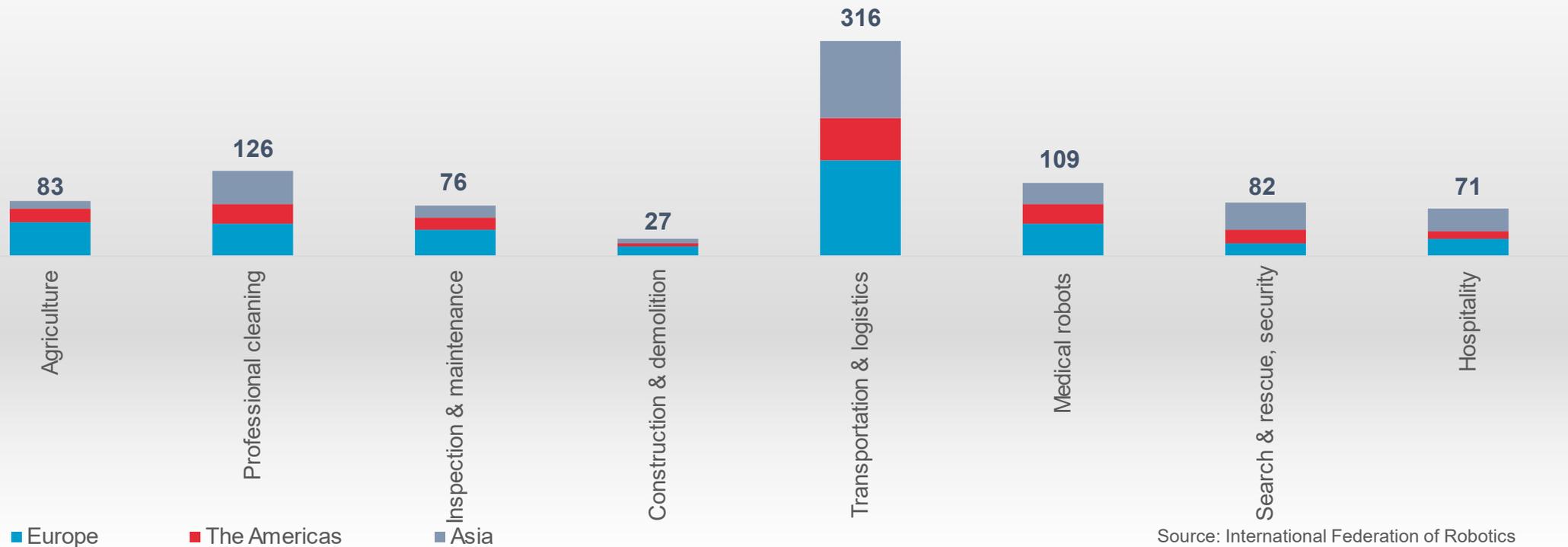
Compiling or comparing data from different survey waves is strongly discouraged.

Top 5 application areas for professional and medical use



Number of manufacturers by application

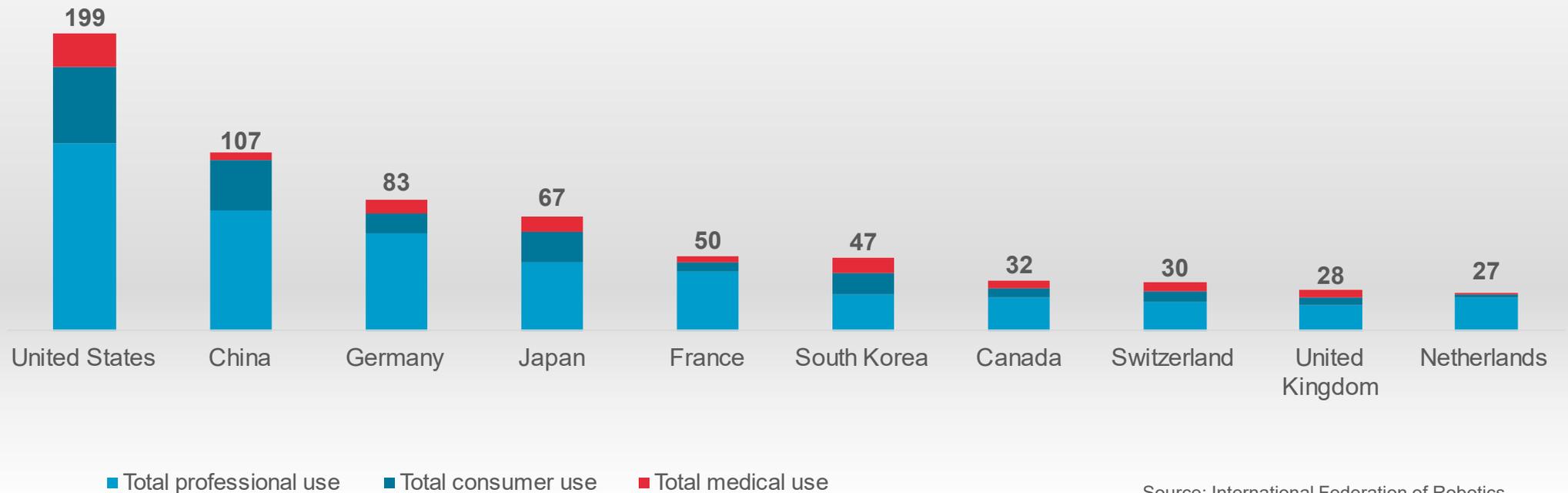
Number of service robot producers by application group and region of origin



Source: International Federation of Robotics

Top 10 countries for service robots suppliers

Professional, consumer use and medical robot manufacturers by country of origin



Source: International Federation of Robotics

Focus: Truck loading and unloading in transportation*

- **Driver:** massive shortage of staff
- **Advantages:** Reduce manual labor and minimize loading/unloading time
- **Technical solutions:** autonomous robotic forklifts or mobile manipulators, combined solutions with conveyor belts
- **Major challenges:** new application, varying complexity of tasks

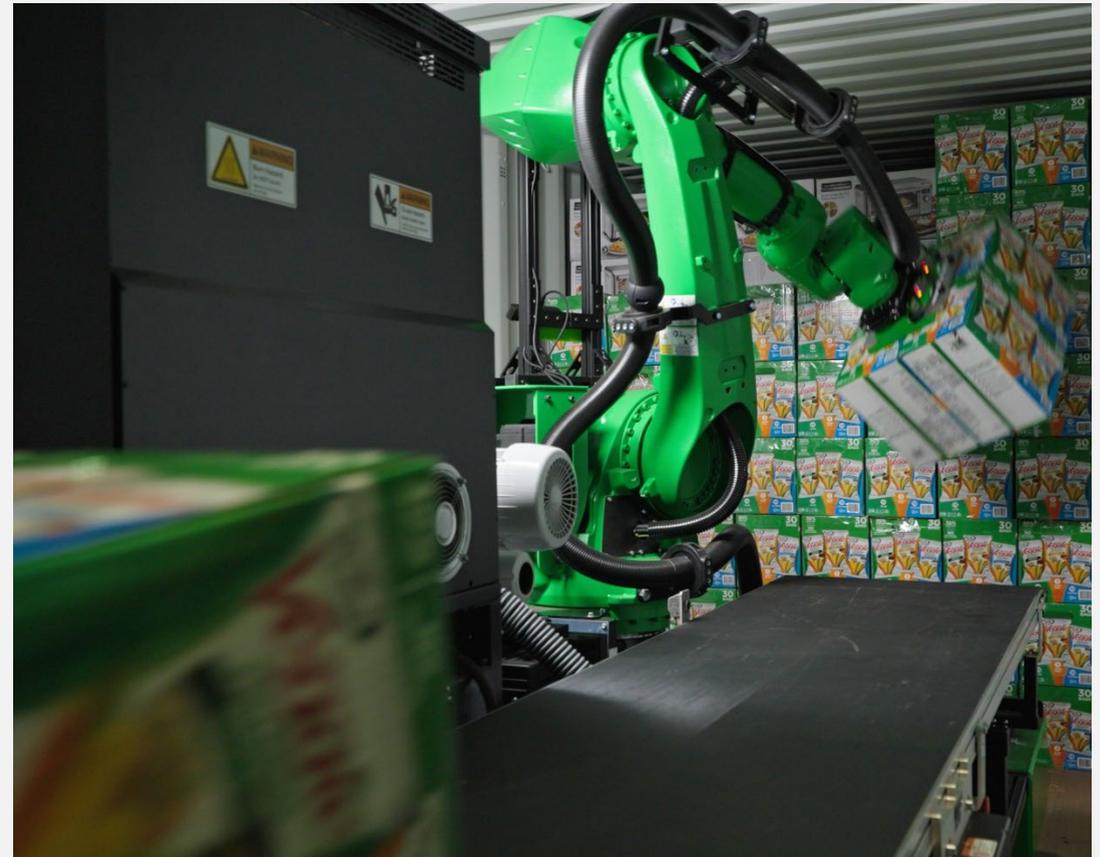


Image: Pickle Robot

*indoor environments without public traffic

Focus: Transportation in outdoor environments without public traffic

- **Drivers:**
 - shortage of workers
 - need for seamless integration of indoor and outdoor intralogistics
- **Major challenges:**
 - dynamic and unpredictable outdoor environments
 - difficult weather conditions
 - uneven ground, irregular surface conditions like gravel
 - obstacles, fewer landmarks



Image: Capra Robotics



Image: Neura Robotics

- Technological advances, e.g. in **generative AI**, improve **robot performance and applicability**
- **Demographic change**: scarcity of labor is driving robot demand
- Need for further **standards**, e.g. on **safety**
- **Excellent long-term prospects**

Humanoid robots: impact on industrial and service robots?!



Image: Epson

established



Image: Staubli

evolving



Images: Fourier, 1X, Agility, Apptronik, Neura Robotics, PAL Robotics

disruptive

technology boost

technology boost

Thank you for your attention.

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<https://ifr.org/>



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