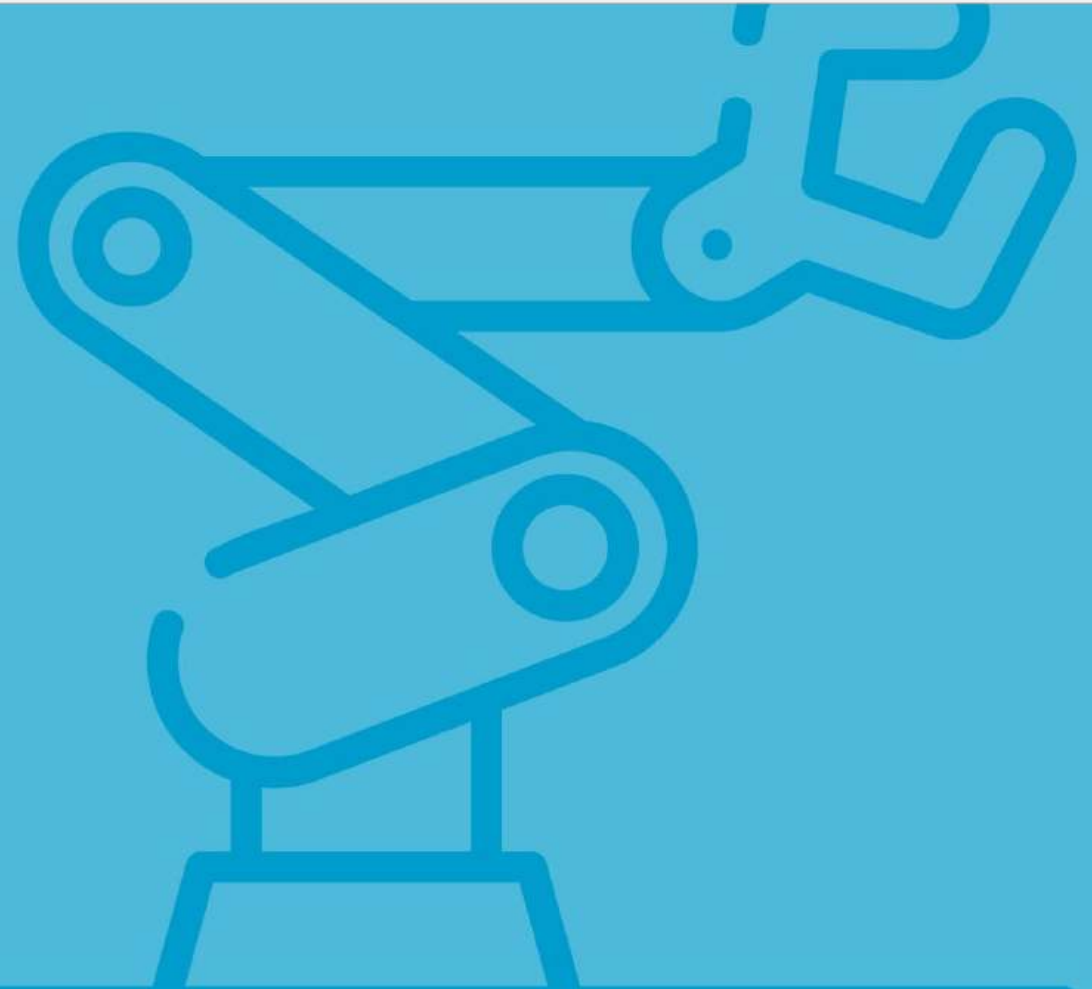


Welcome to the presentation of

# 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



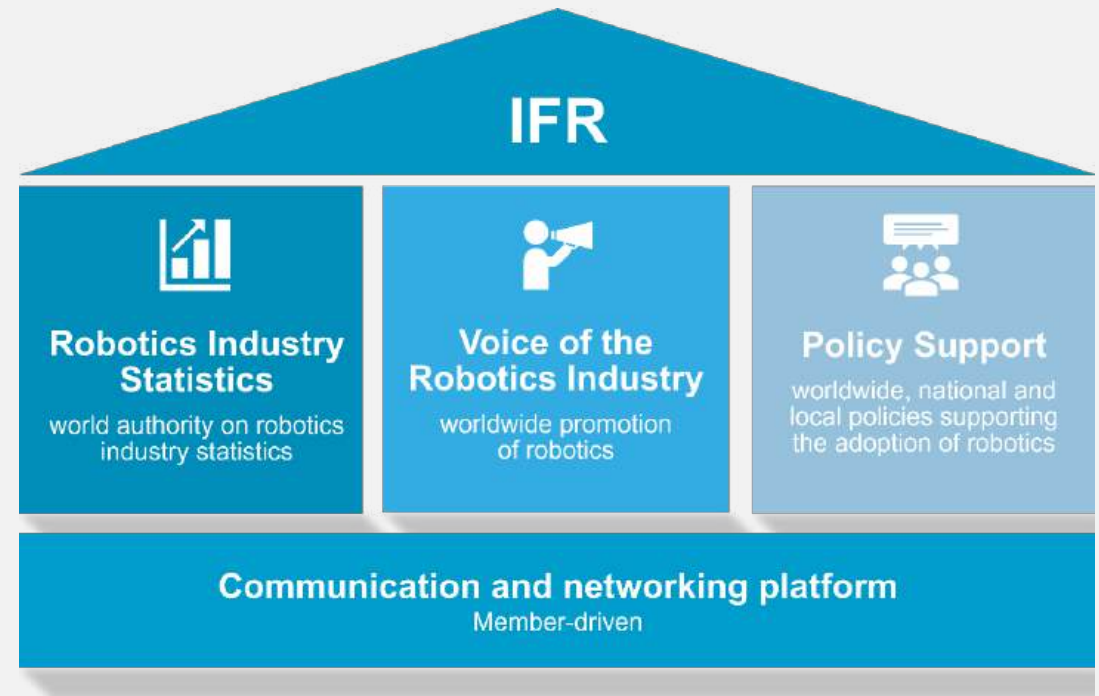
**Dr. Susanne Bieller**  
General Secretary

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



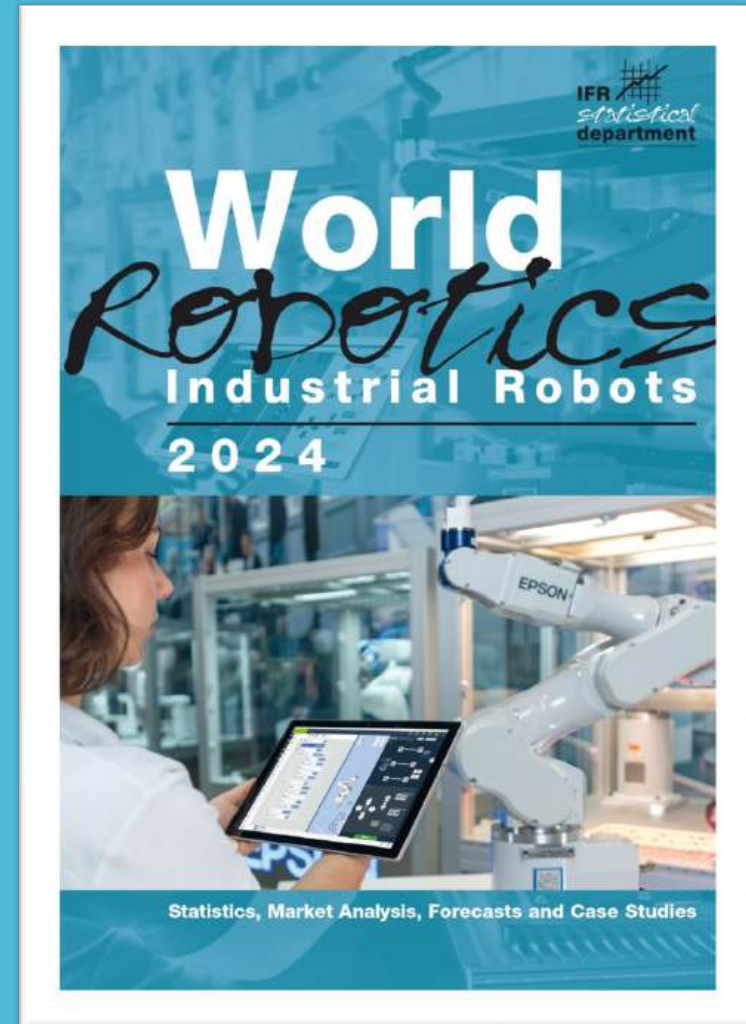
Source: Epson

## Service, mobile and medical robots

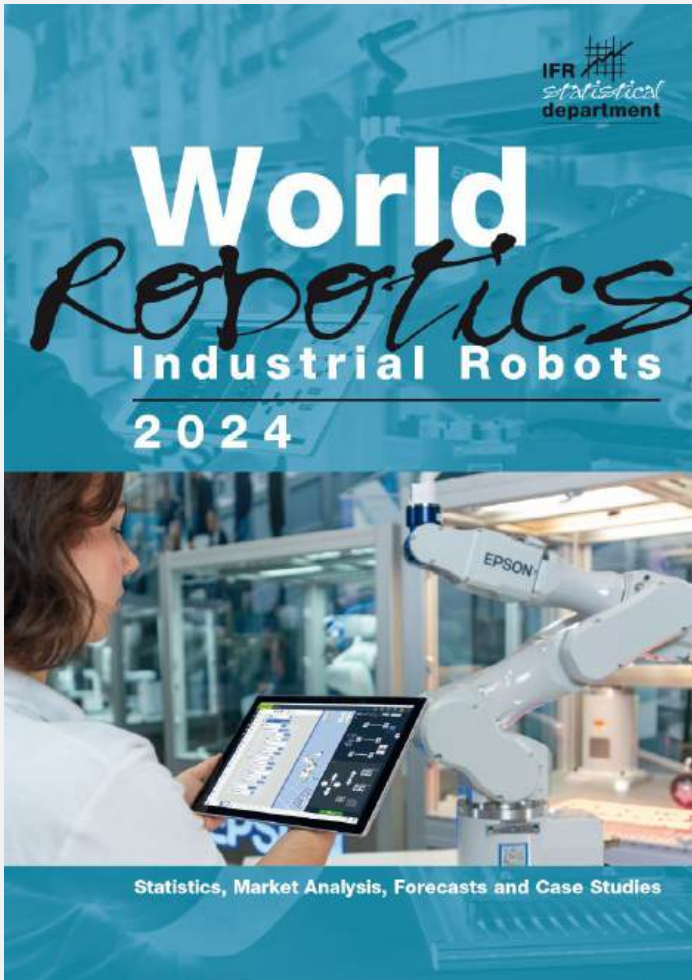


Source: Stäubli

# 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

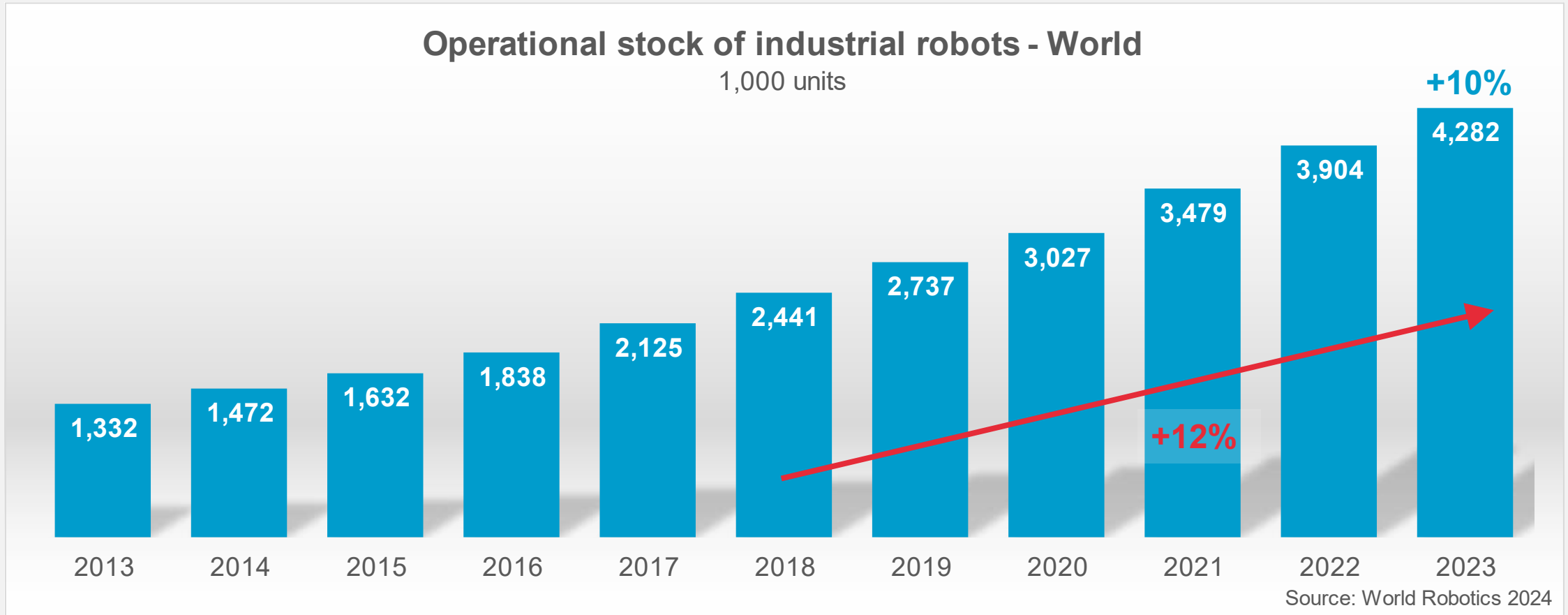
- 541,000 units (-2%)
- CAGR 2018-2023: +5%

## Robot stock

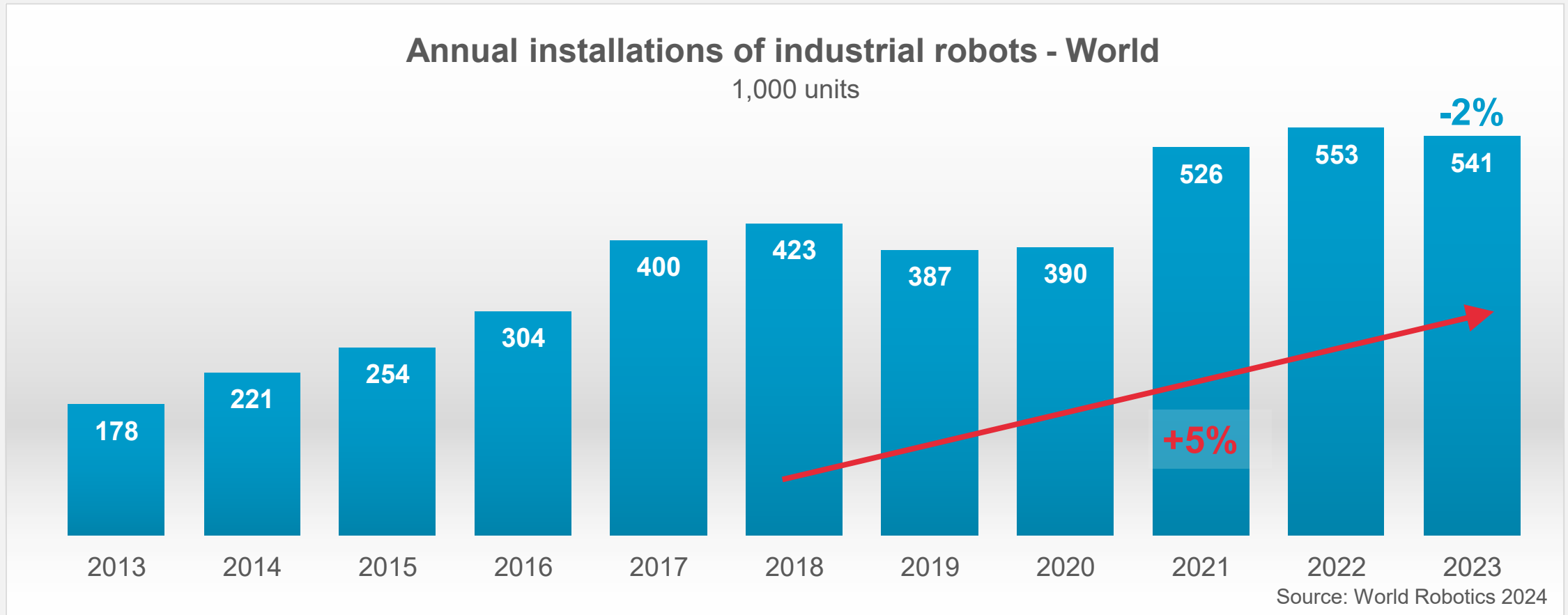
- 4.3 million units (+10%)
- CAGR 2018-2023: +12%



# More than 4 million industrial robots operating around the world



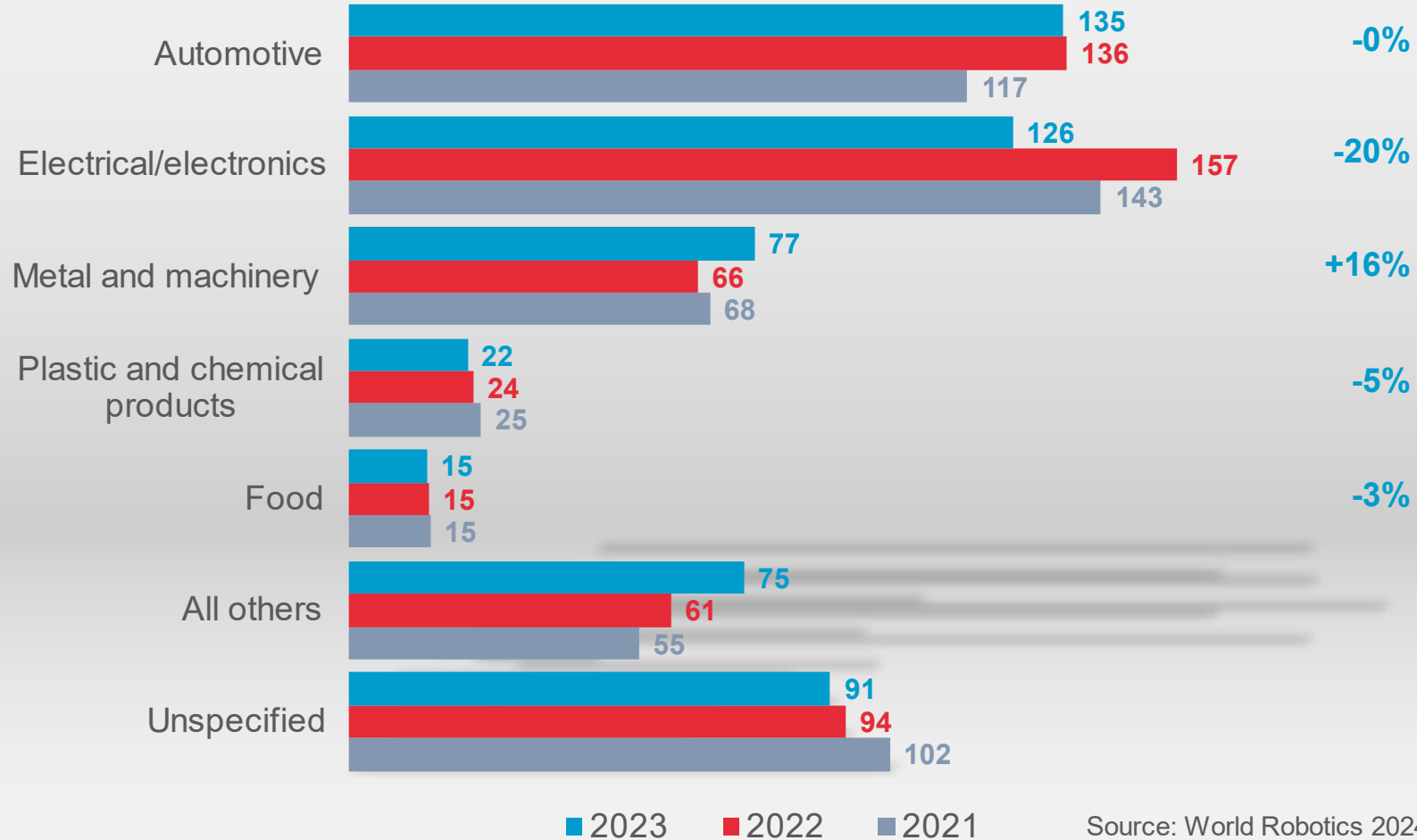
# Annual installations exceeded 500,000 units for the third consecutive year



**Automotive main customer due to weak demand from electronics**

**Annual installations of industrial robots by customer industry- World**

1,000 units

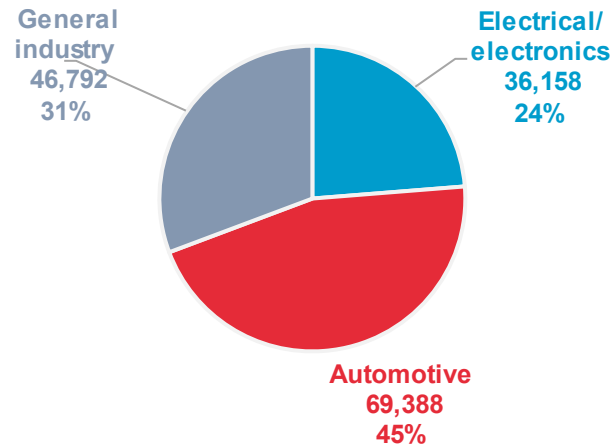


Source: World Robotics 2024

# General industries are growing their market share

## Shares of majors industries in 2013

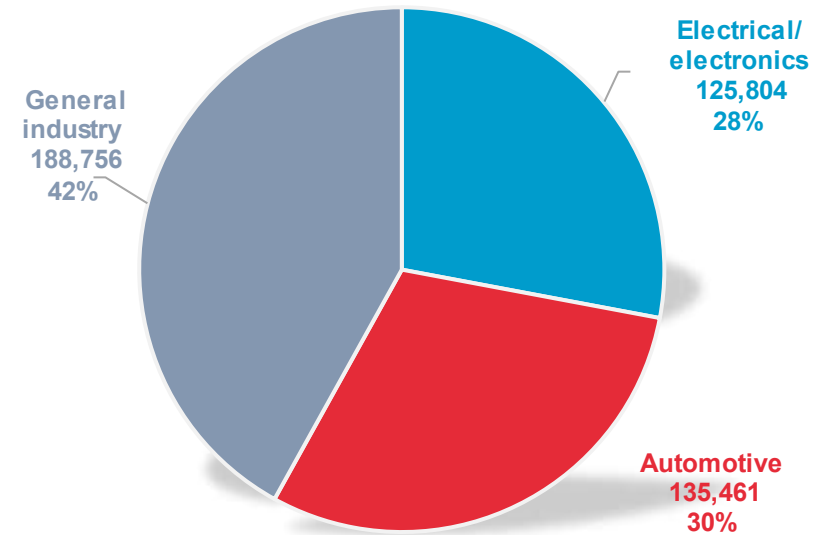
Annual installations of industrial robots: automotive and electronics vs. general industry - 2013 - World



Source: International Federation of Robotics

## Shares of majors industries in 2023

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

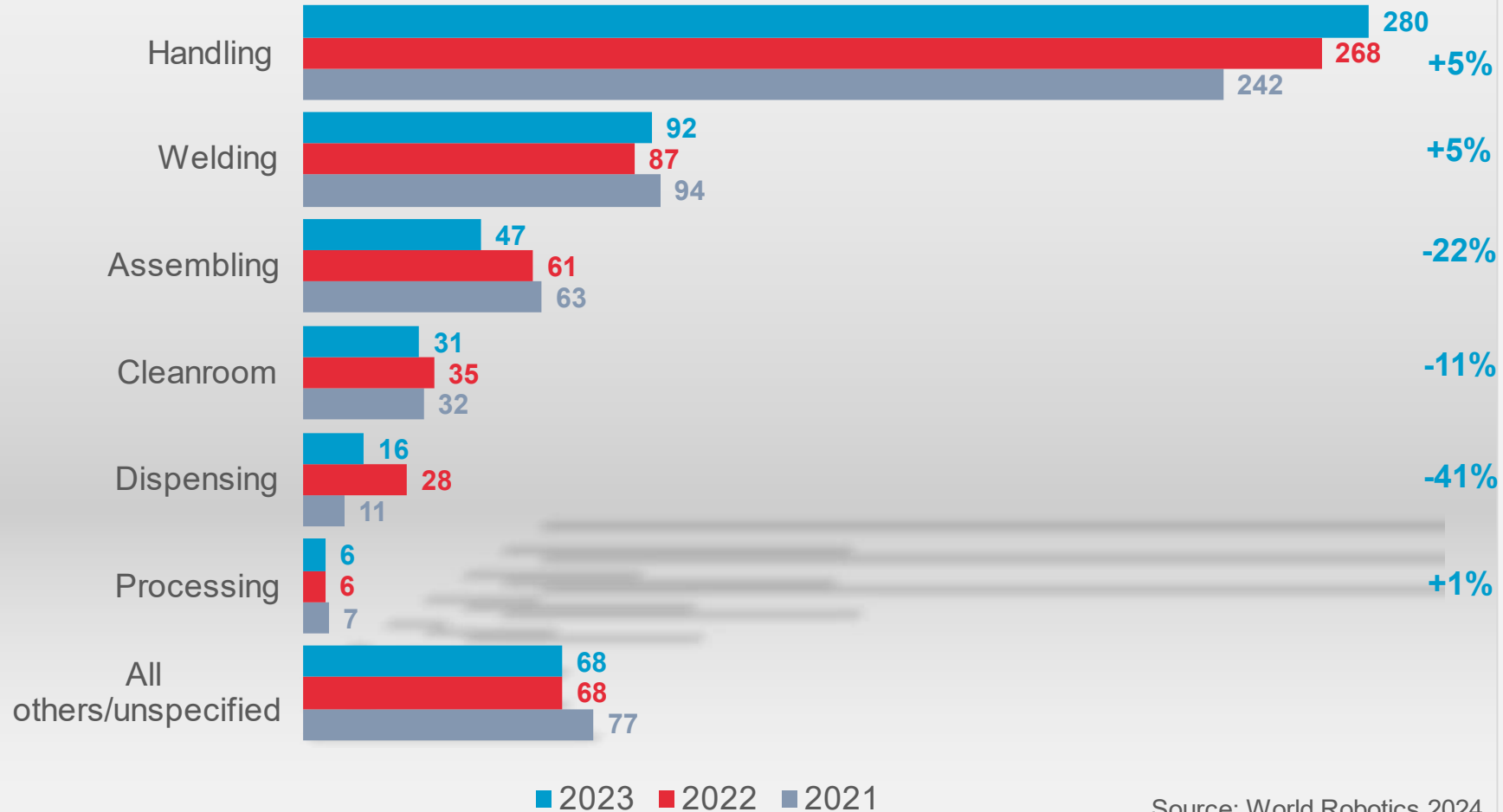


Source: International Federation of Robotics

## Handling by far the largest application

### Annual installations of industrial robots by application- World

1,000 units

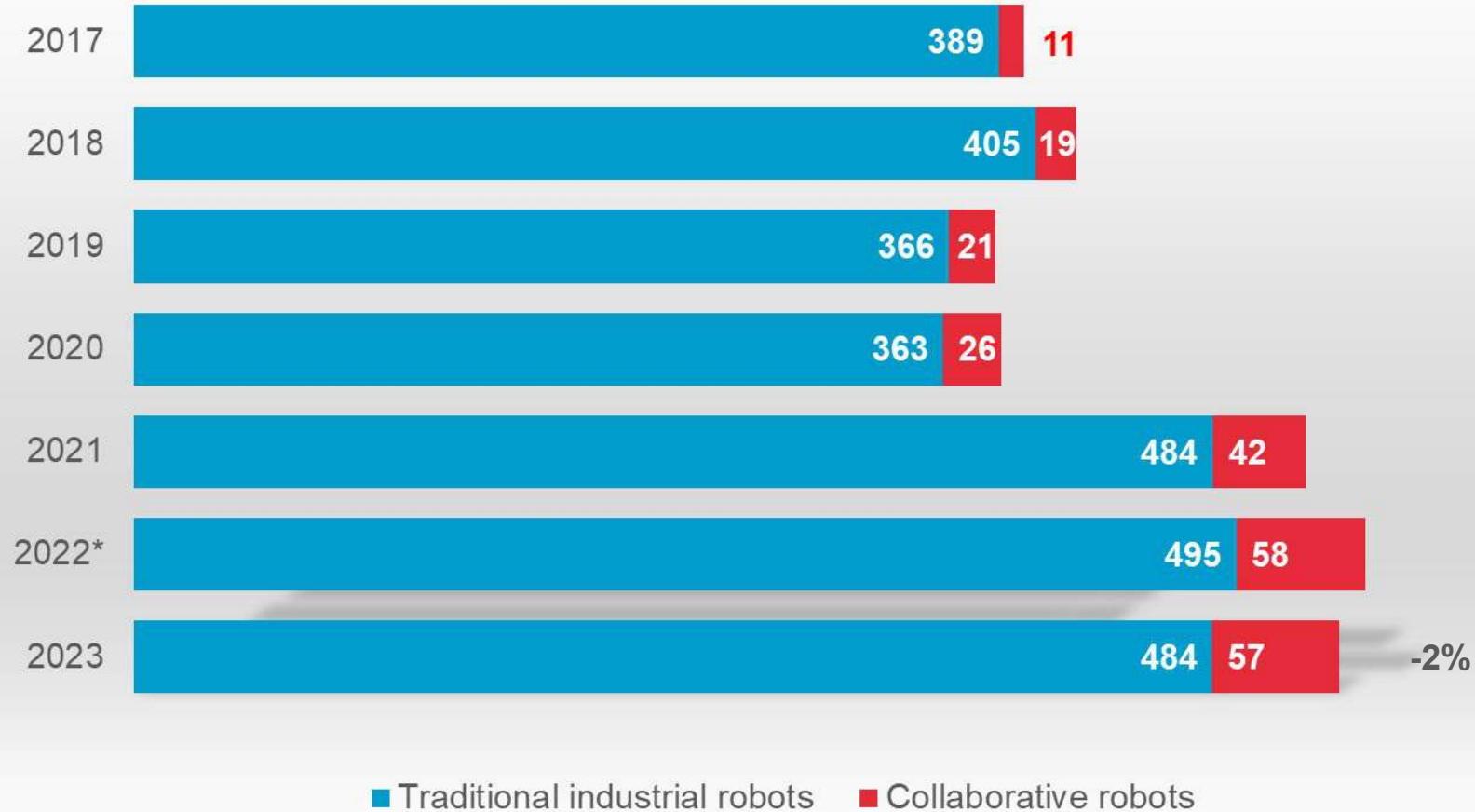


Source: World Robotics 2024

## Collaborative robot installations declining for the first time

### Collaborative and traditional industrial robots

'000 units

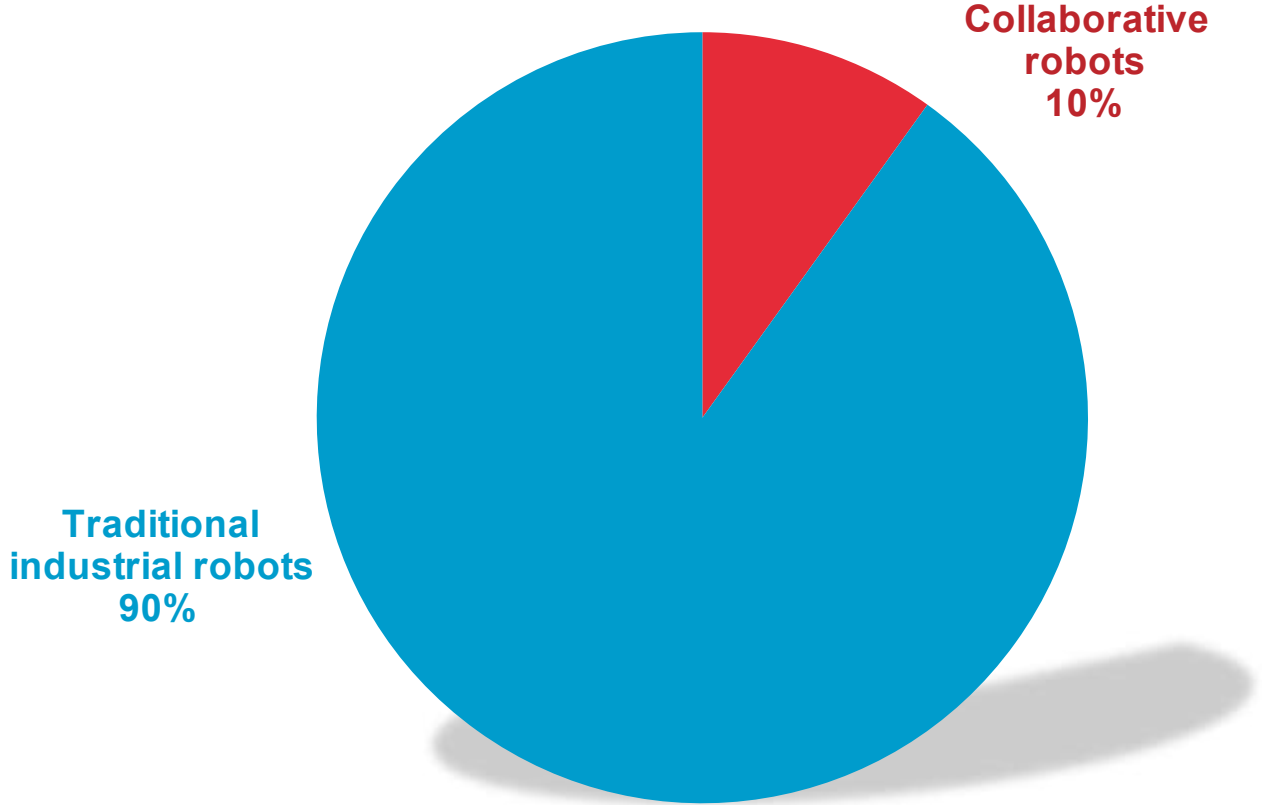


\*revised

Source: International Federation of Robotics

**Collaborative robots share remains at 10%**

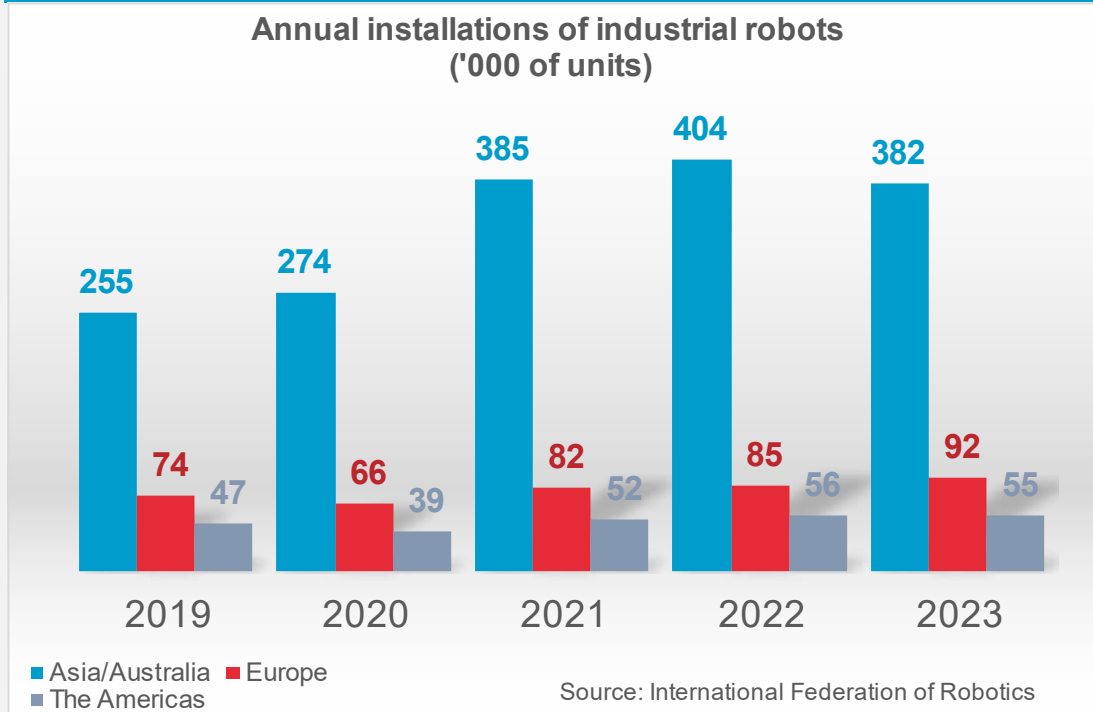
**Shares of collaborative vs. traditional industrial robots  
2023**



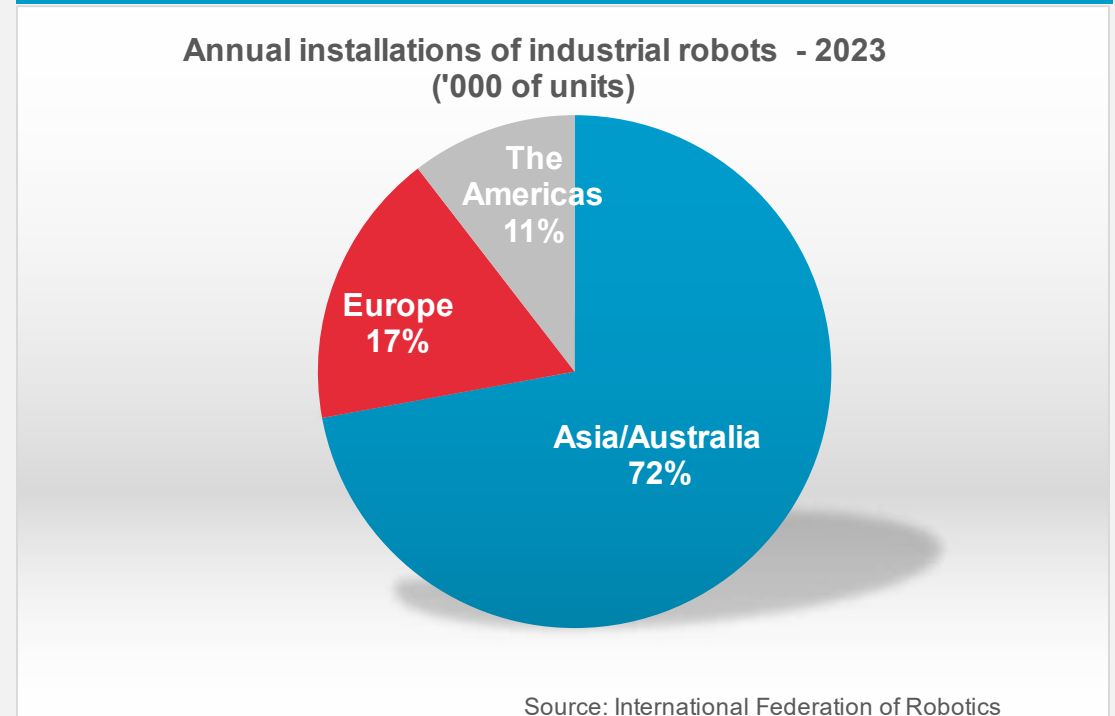
Source: International Federation of Robotics

# Growth in Europe

## Annual installations per region



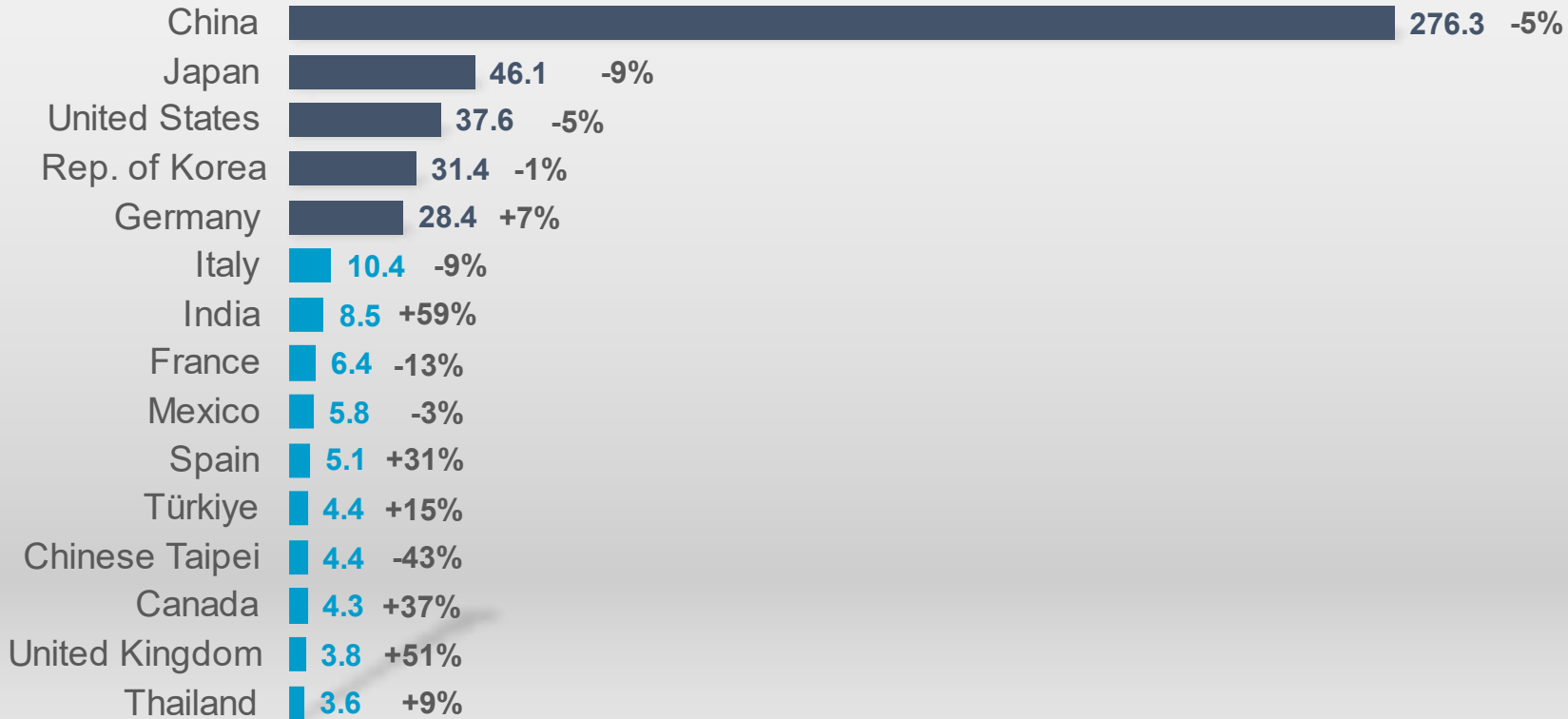
## Shares of regions





**China installs every other robot**

**Annual installations of industrial robots  
15 largest markets 2023**



**51% in China**

**79% in the  
top 5 markets**

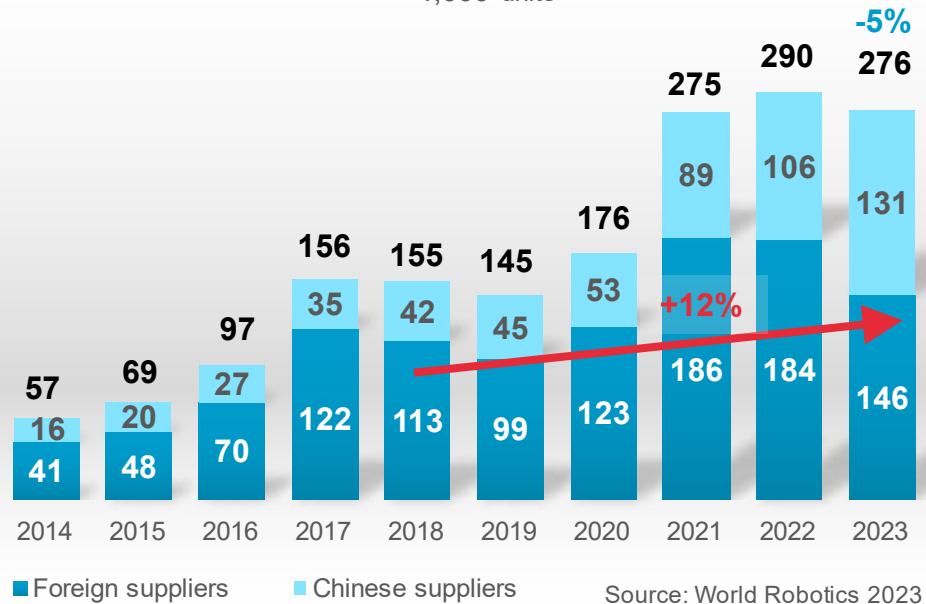
'000 of units

Source: World Robotics 2024

# Growth in China comparable to global growth

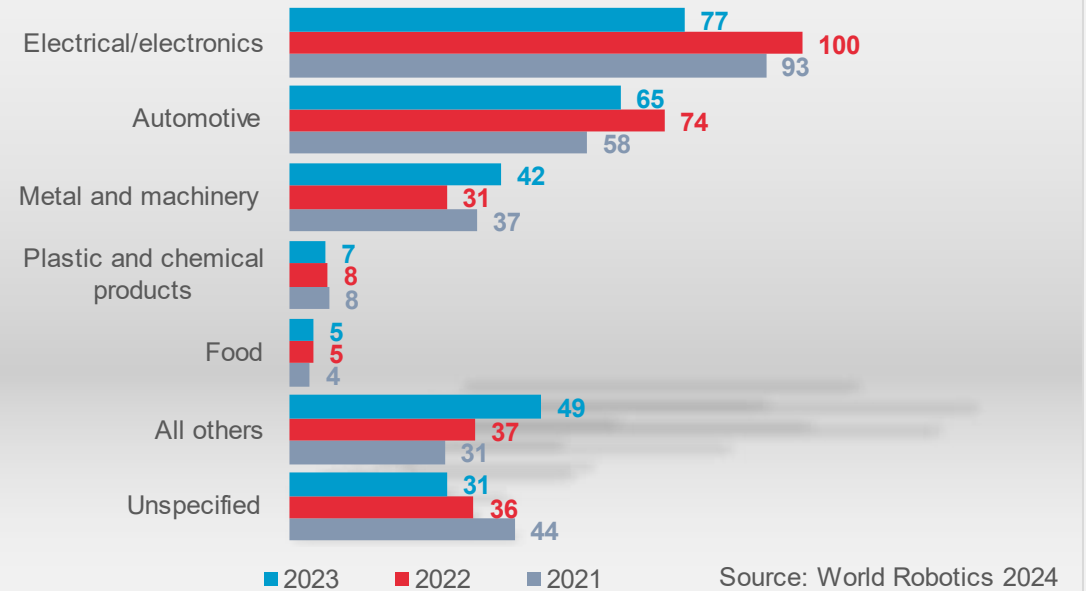
## Share of Chinese suppliers at 47%

Annual installations of industrial robots - China  
1,000 units



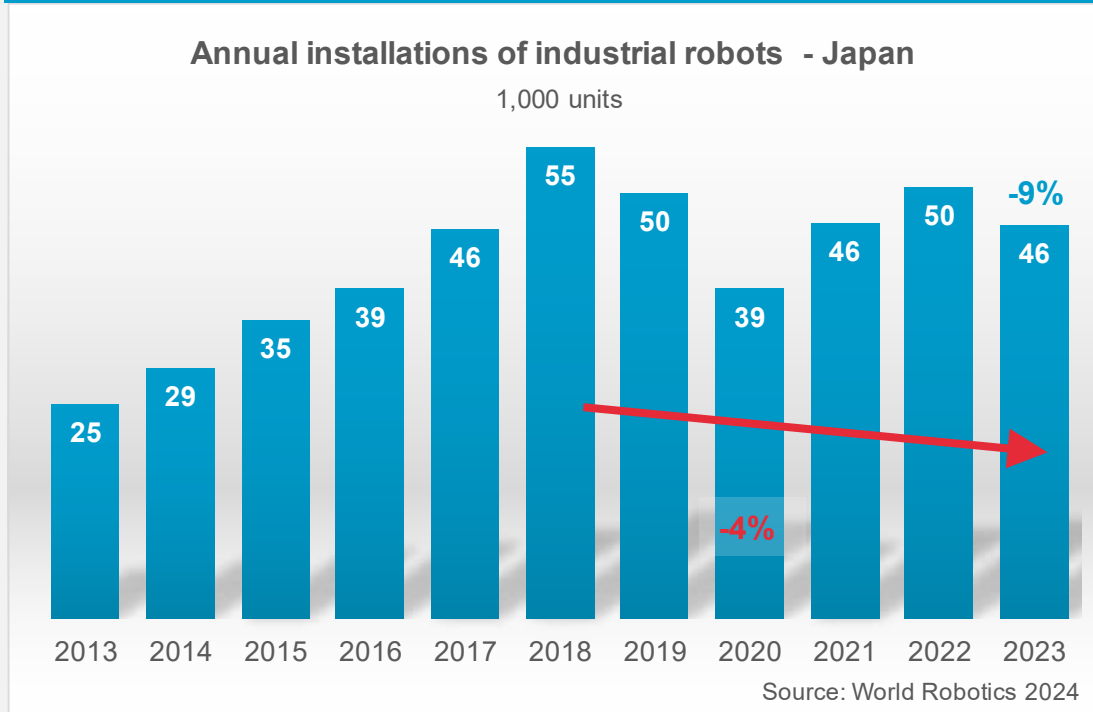
## Electronics main customer industry in China

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

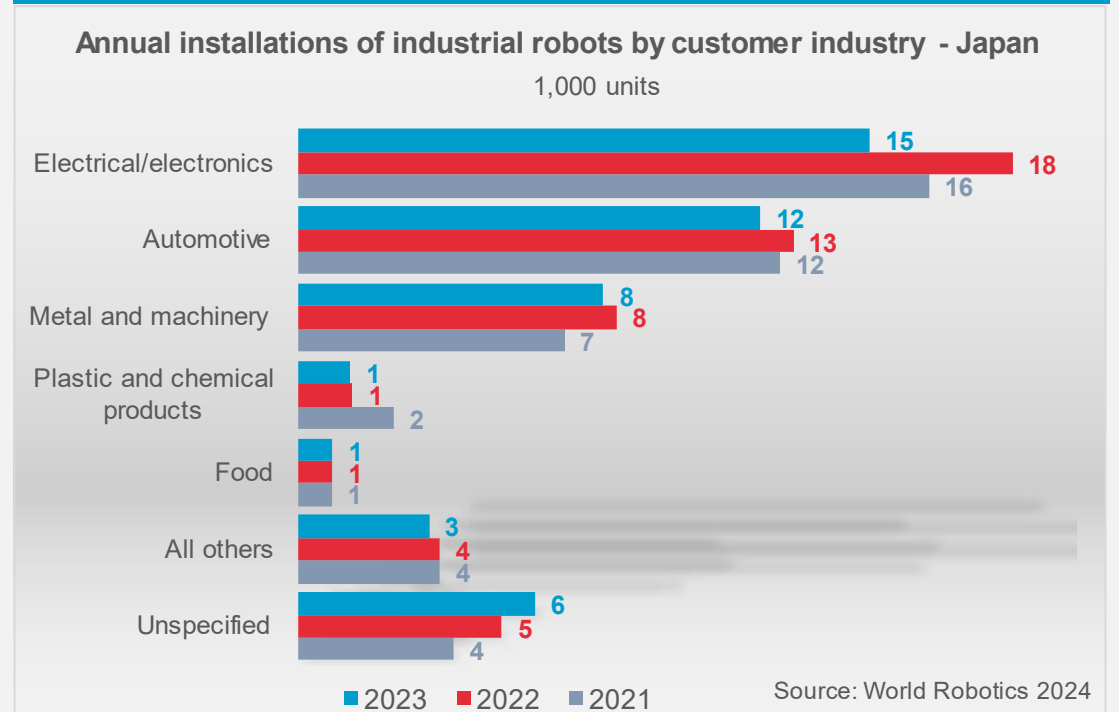


# Japan seeking new impetus

## Installations level out at 46 thousand units



## Electronics and automotive industry decline

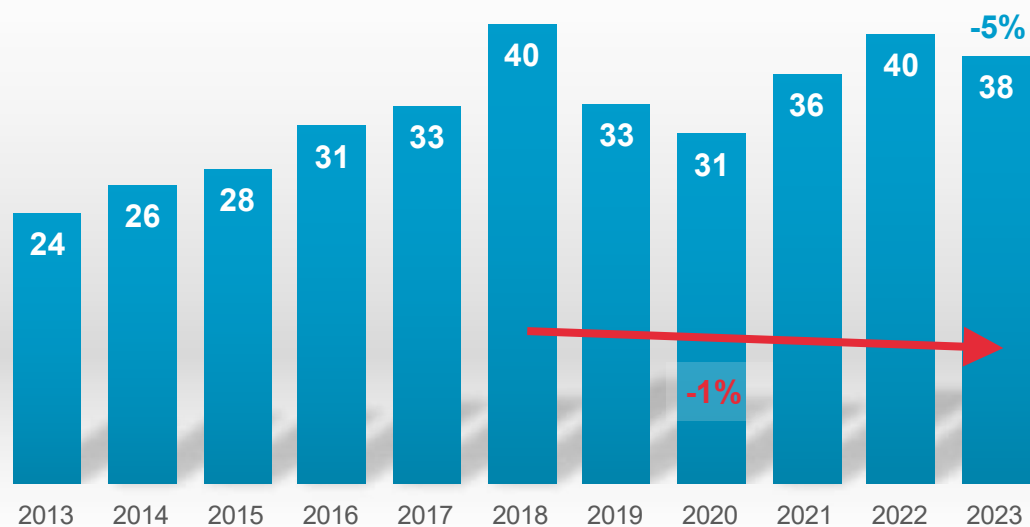


# US installations remain high

## United States: Third highest level ever recorded

Annual installations of industrial robots - United States

1,000 units

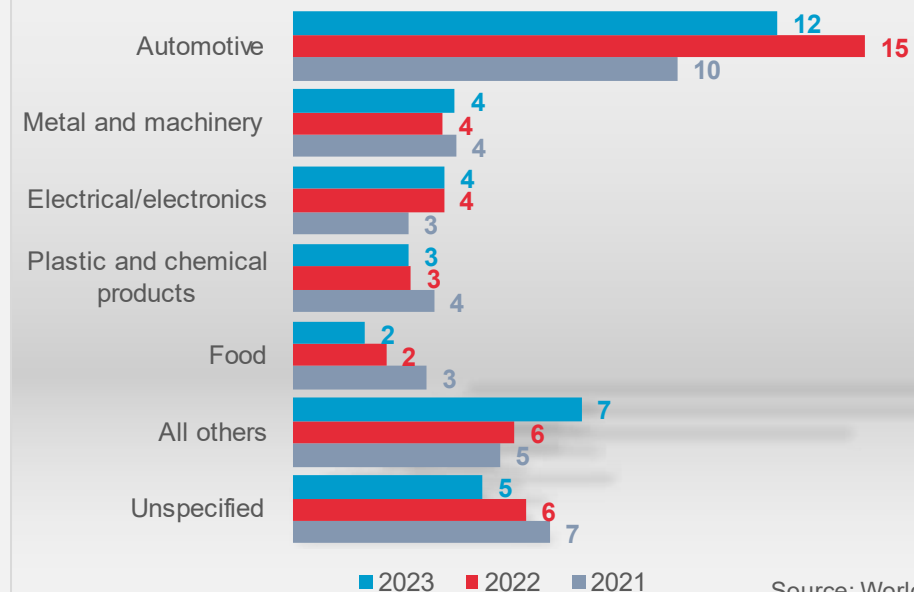


Source: World Robotics 2024

## US Automotive Industry installs fewer robots

Annual installations of industrial robots by customer industry United States

1,000 units



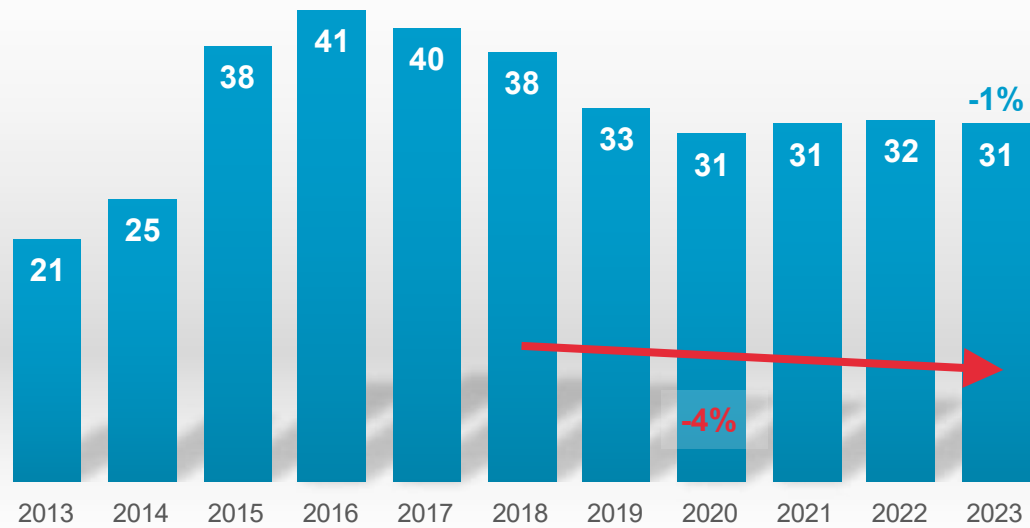
Source: World Robotics 2024

# Korea: moving sideways

## Korean robot demand moving sideways

Annual installations of industrial robots - Rep. of Korea

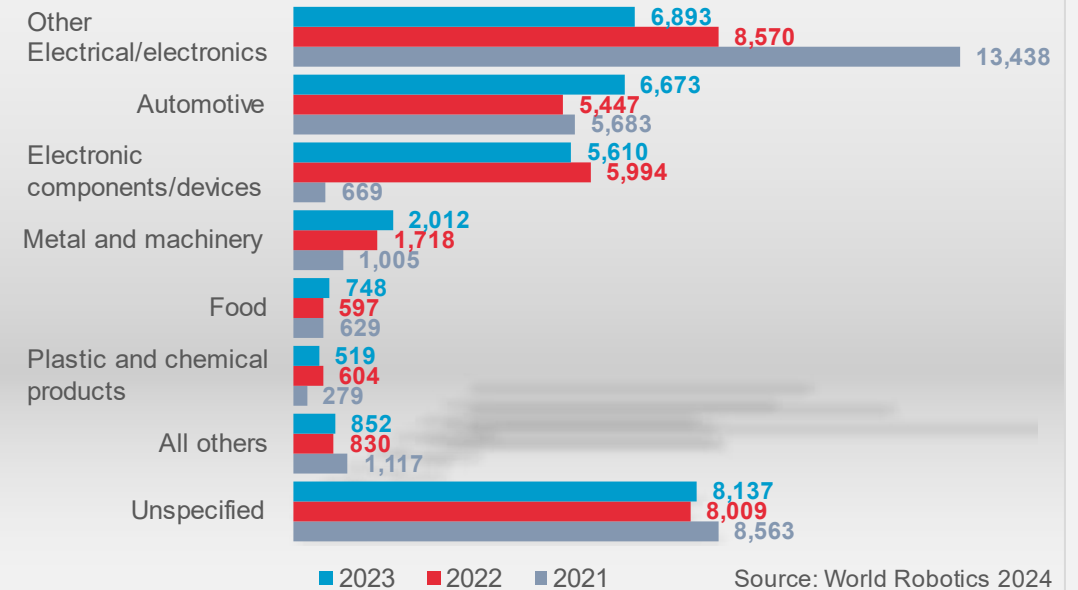
1,000 units



Source: World Robotics 2024

## Korean electronics industry down 9%

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

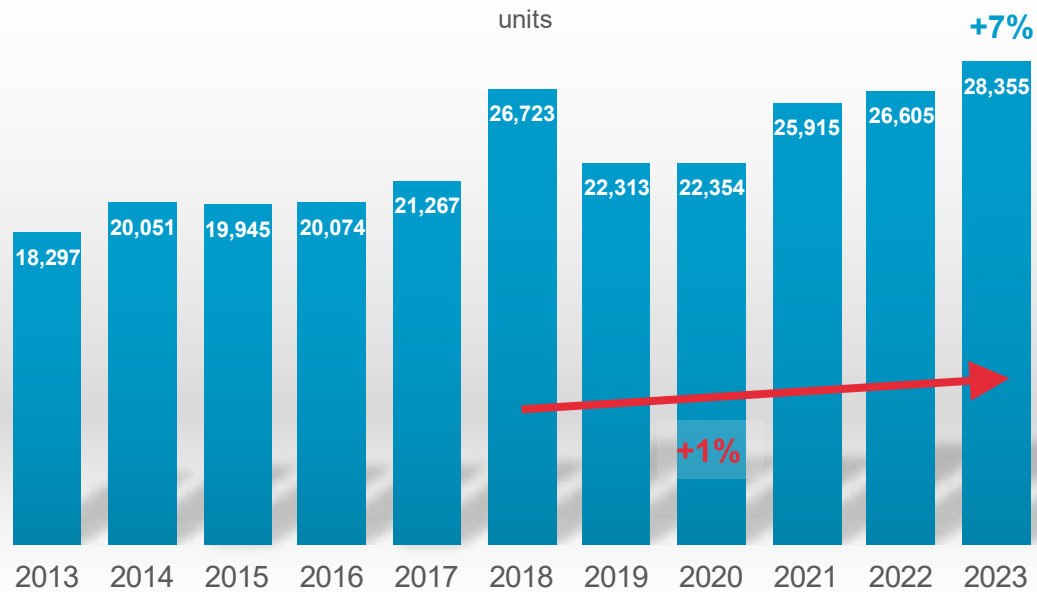


Source: World Robotics 2024

# Germany: Automotive back on growth track

## Germany growing

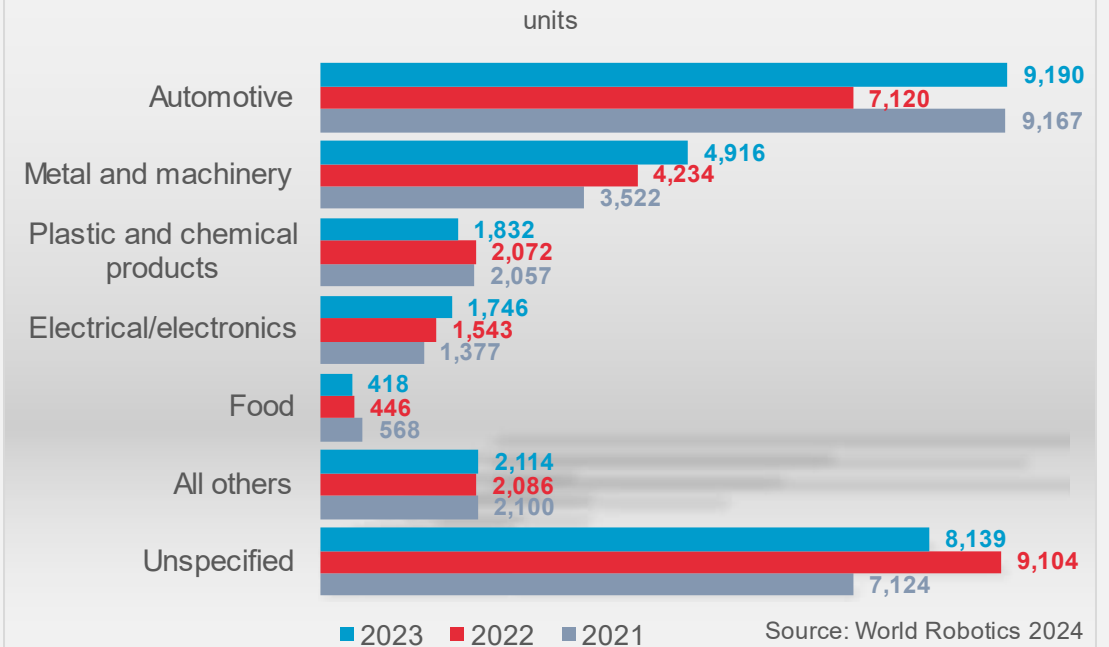
Annual installations of industrial robots - Germany



Source: World Robotics 2024

## Growth in automotive and in metal/machinery

Annual installations of industrial robots by customer industry - Germany



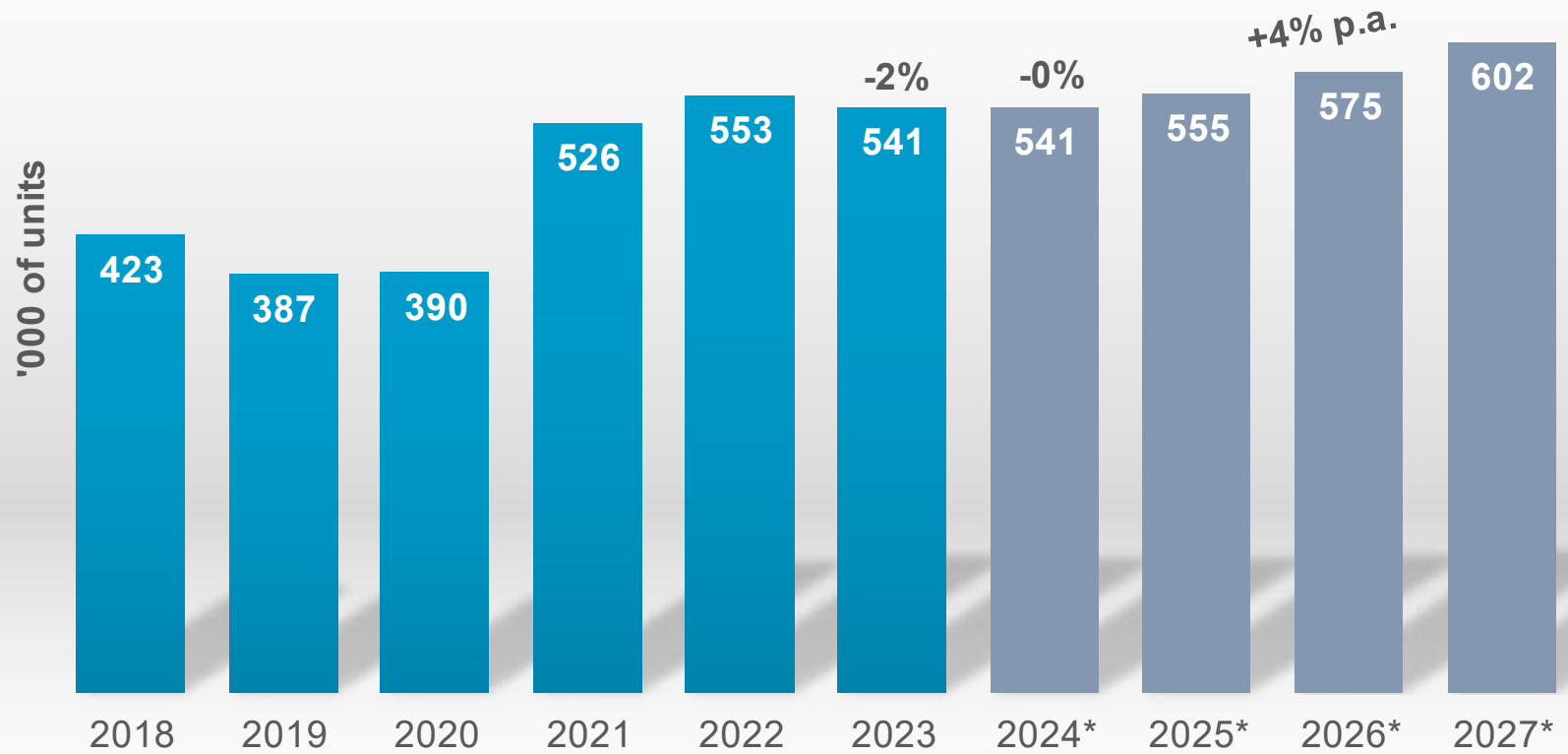
Source: World Robotics 2024

# Trends and Forecast



Sideways movement for 2024 expected

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



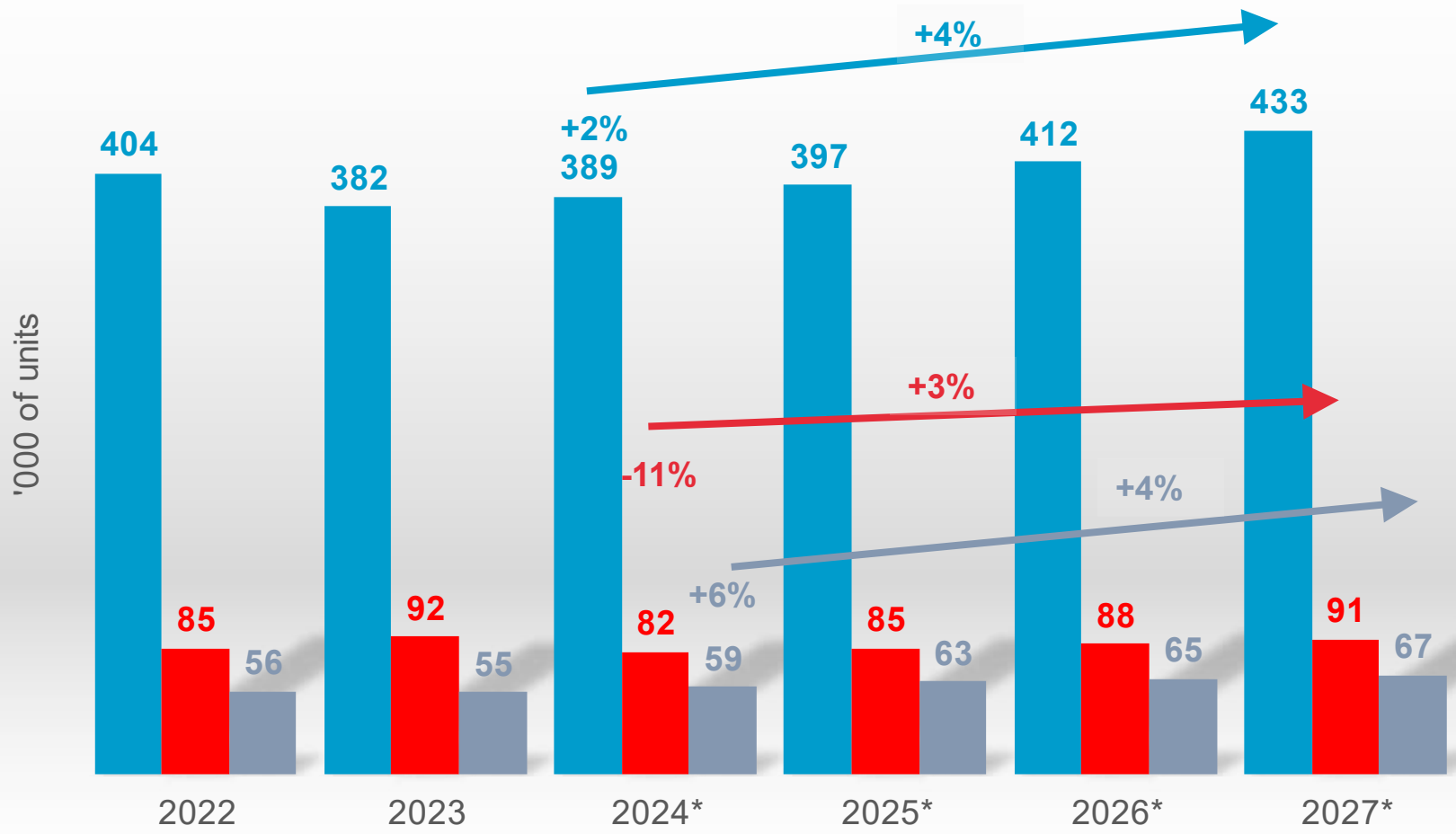
\*forecast

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

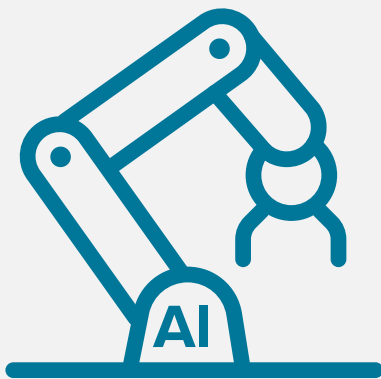


- Various **headwinds** retain investments
- Expected **rebound** of demand from the **electronics industry**
- **Global economic growth** expected to **stabilize**
- **Decrease of order intake seems to have bottomed out\***

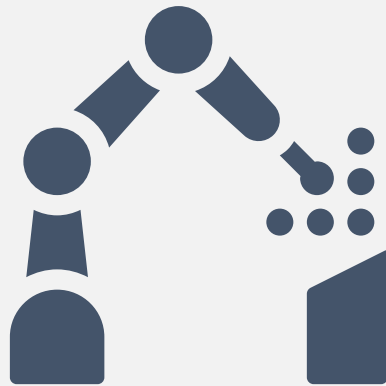
\*IFR Quarterly Survey: Growth rate of order intake in currency units compared to same period last year.

# TOP 5 Global Robotics Trends in 2024

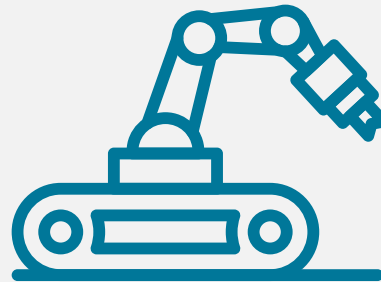
**AI AND  
MACHINE  
LEARNING**



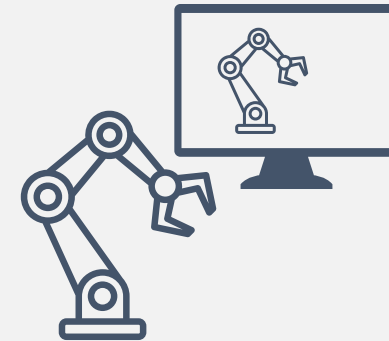
**COBOTS IN  
NEW  
APPLICATIONS**



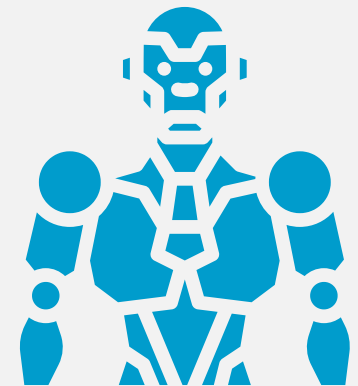
**MOBILE  
MANIPULATORS**



**DIGITAL TWIN**



**HUMANOIDS**



# Technological trends



Image: PAL Robotics

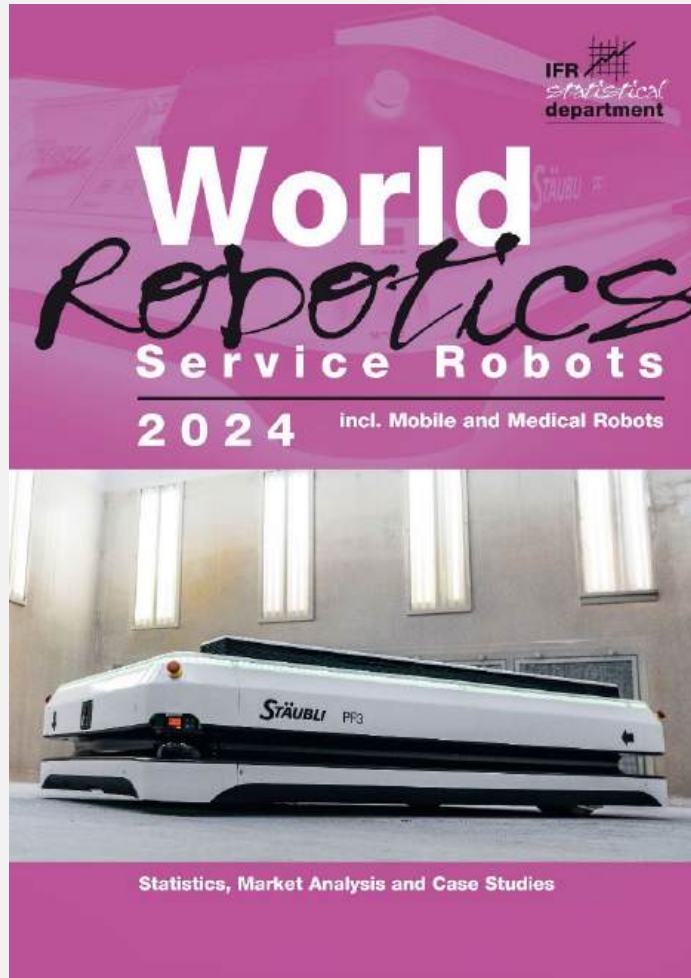
- **Mobile manipulators** offer new use cases, whenever transportation and handling tasks need to be jointly automated end-to-end in one device
- Research & development of **humanoid robots** will yield new technological capabilities
- Improvements in marketable **artificial intelligence** solutions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

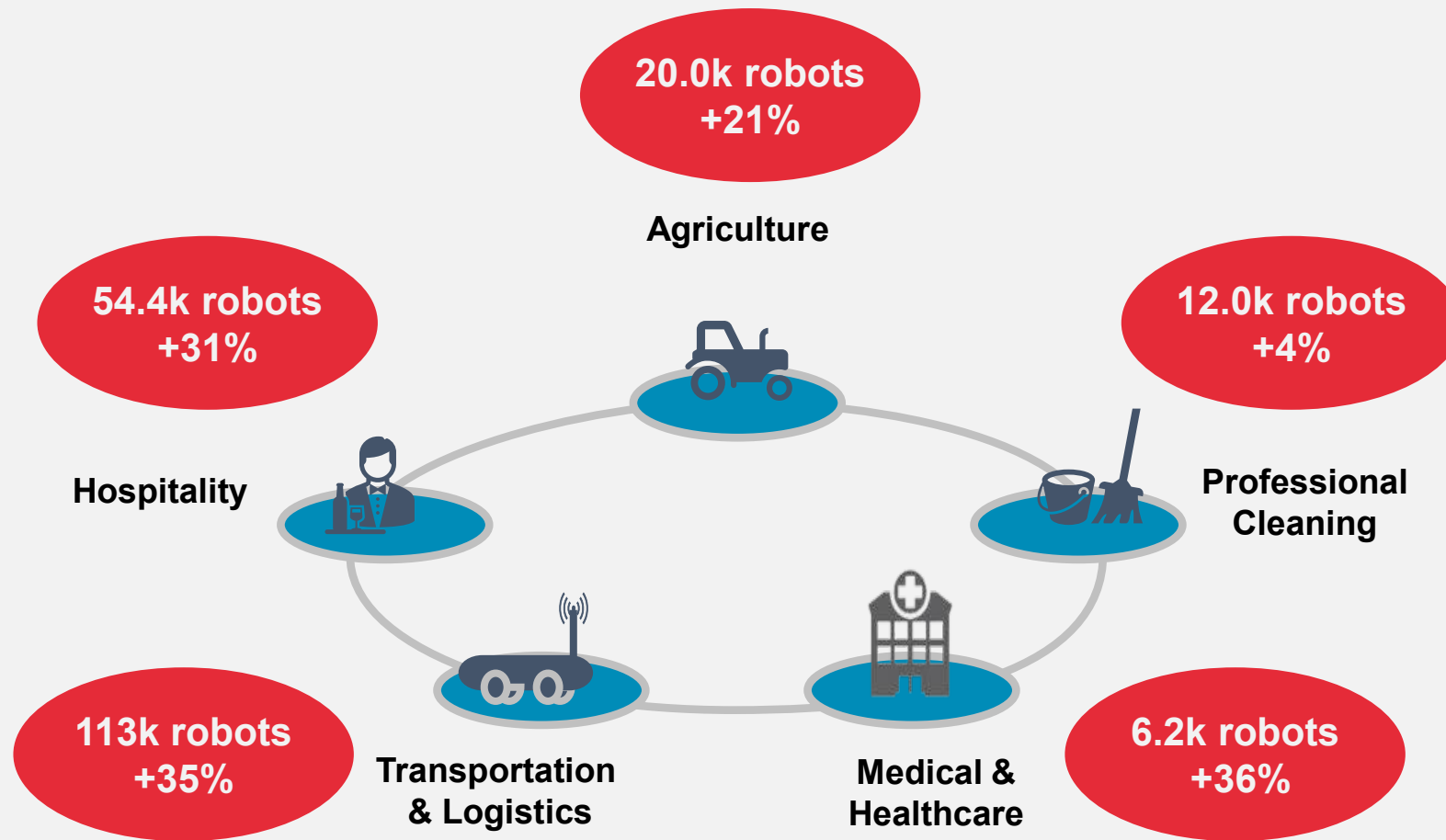
### New consumer service robots

- 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.

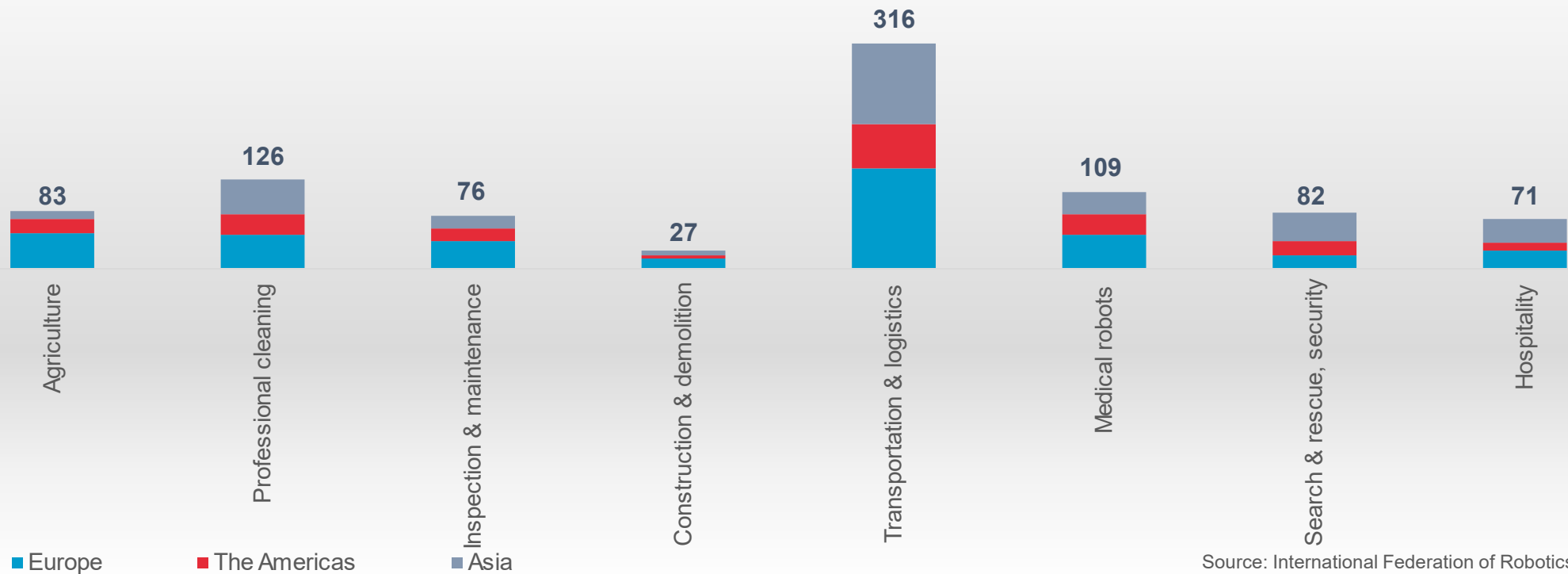
Compiling or comparing data from different survey waves is strongly discouraged.

# 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

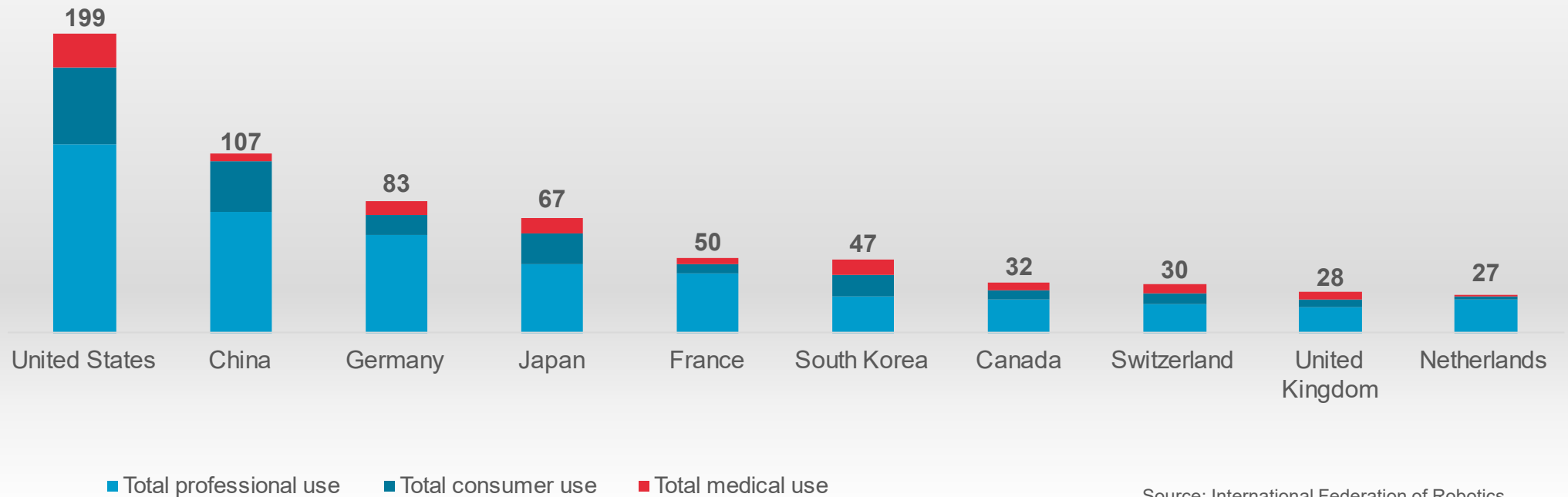


Source: International Federation of Robotics



# 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

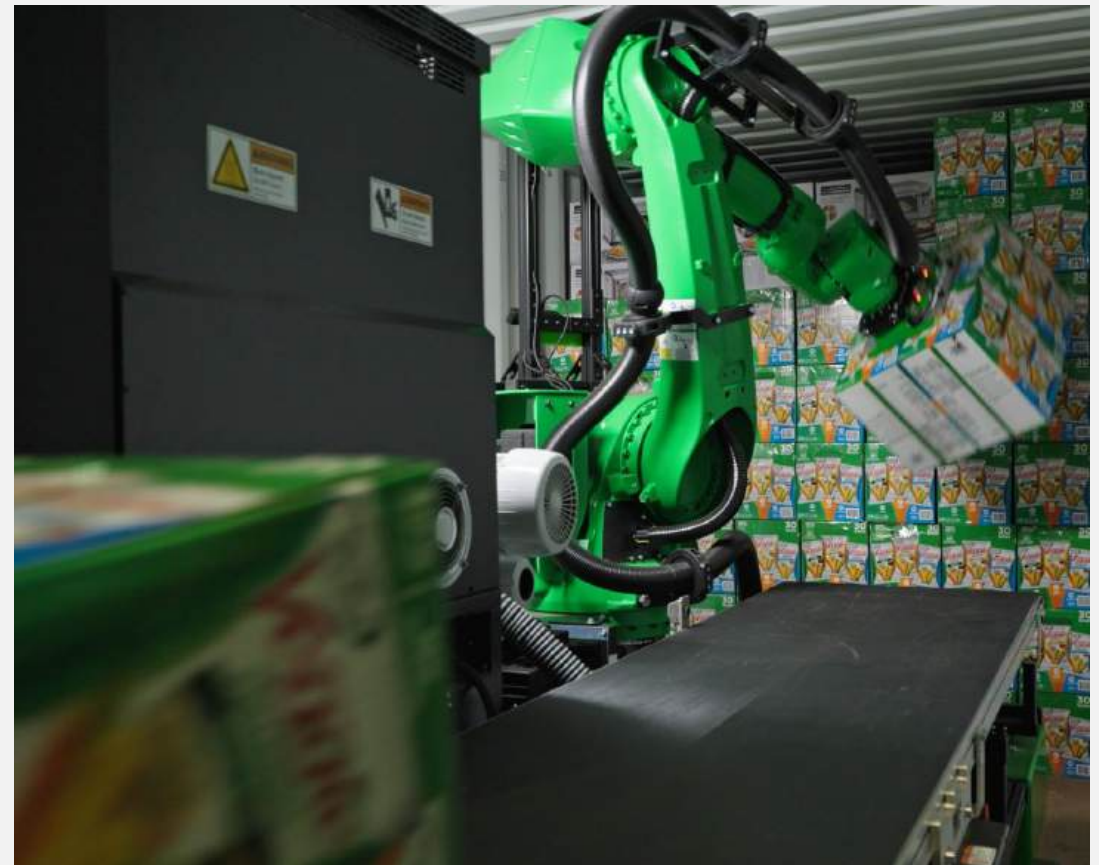


Image: Pickle Robot

\*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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