



Welcome to the

IFR Press Conference

24th September 2020

Frankfurt

 [#WorldRobotics2020](https://twitter.com/WorldRobotics2020)

Agenda

Welcome

Presentation of the Speakers

World Robotics 2020 Industrial Robots

World Robotics 2020 Service Robots

Questions



Statistics, Market Analysis and Forecasts

Speakers on the panel



Milton Guerry

IFR President

President
Schunk, USA



Susanne Bieller

General Secretary

International Federation of
Robotics, Germany



Christopher Müller

Director Statistical Dpt.

International Federation of
Robotics, Germany



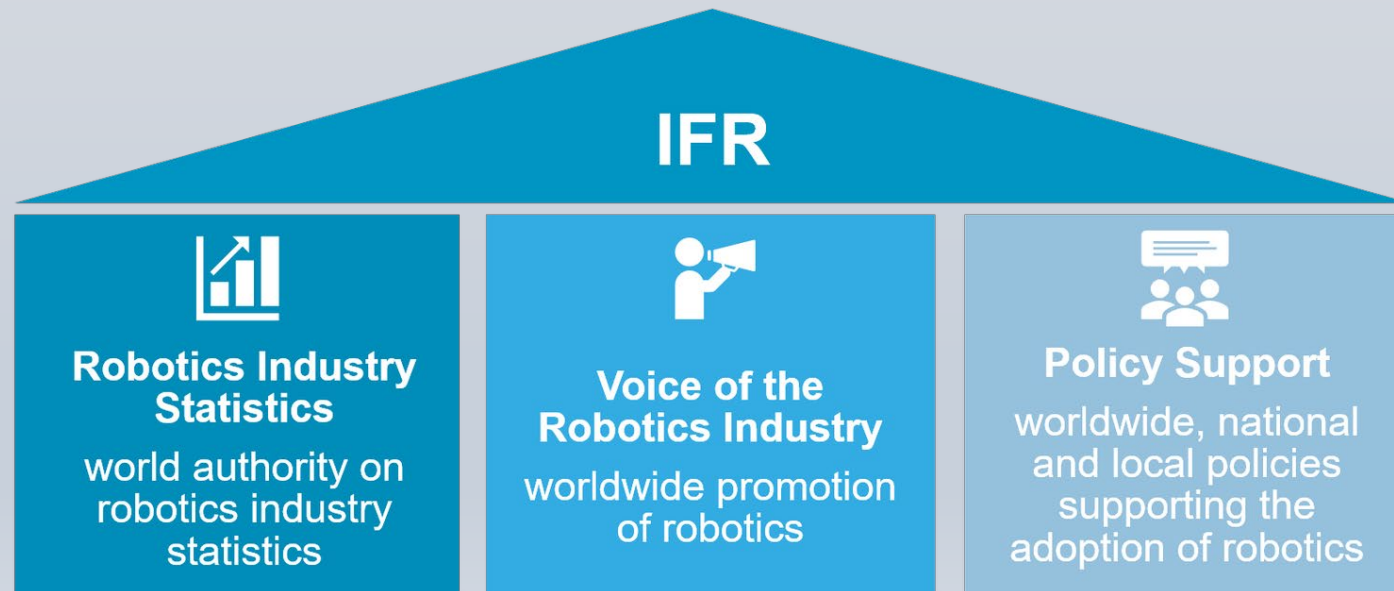
Werner Kraus

Vice Chair IFR Service Robot
Group

Head of Dpt. Robot and
Assistive Systems
Fraunhofer IPA, Germany

International Federation of Robotics

- **Non-profit organization since 1987**
- **Connecting the world of robotics around the globe**
- **65 members from over 20 countries**
- **Annual global robotics turnover \$50 billion** (robot systems including software & peripherals)



Two separate reports

- **industrial robots**

- automatically controlled, programmable, multipurpose, 3+ axes, for use in industrial automation applications
- based on 5 different kinematic types that are equipped with applications-specific end-effectors

- **service robots:**

- performs tasks excluding industrial automation
- usually application-specific design, often fewer than 3 axes
- sometimes not fully autonomous but remote-controlled

➤ **different customers, pricing, machinery, distribution channels, suppliers**



The blurring lines between industrial and service robots

Depending on its **application**, the same unit can be a service robot or an industrial robot.

Usage concepts change – new applications emerge.

Reimagine business processes to make optimal use of collaborative robots.

AI and machine learning technologies enable robots to **sense and respond** to their environment.

Robots are increasingly supporting humans both at **work** and in their **private lives**.



World Robotics

Industrial Robots

2020



Statistics, Market Analysis, Forecasts and Case Studies

2019: Global economic downturn and trade tensions leave their marks

Robot stock

2019: 2.7 million units, +12%

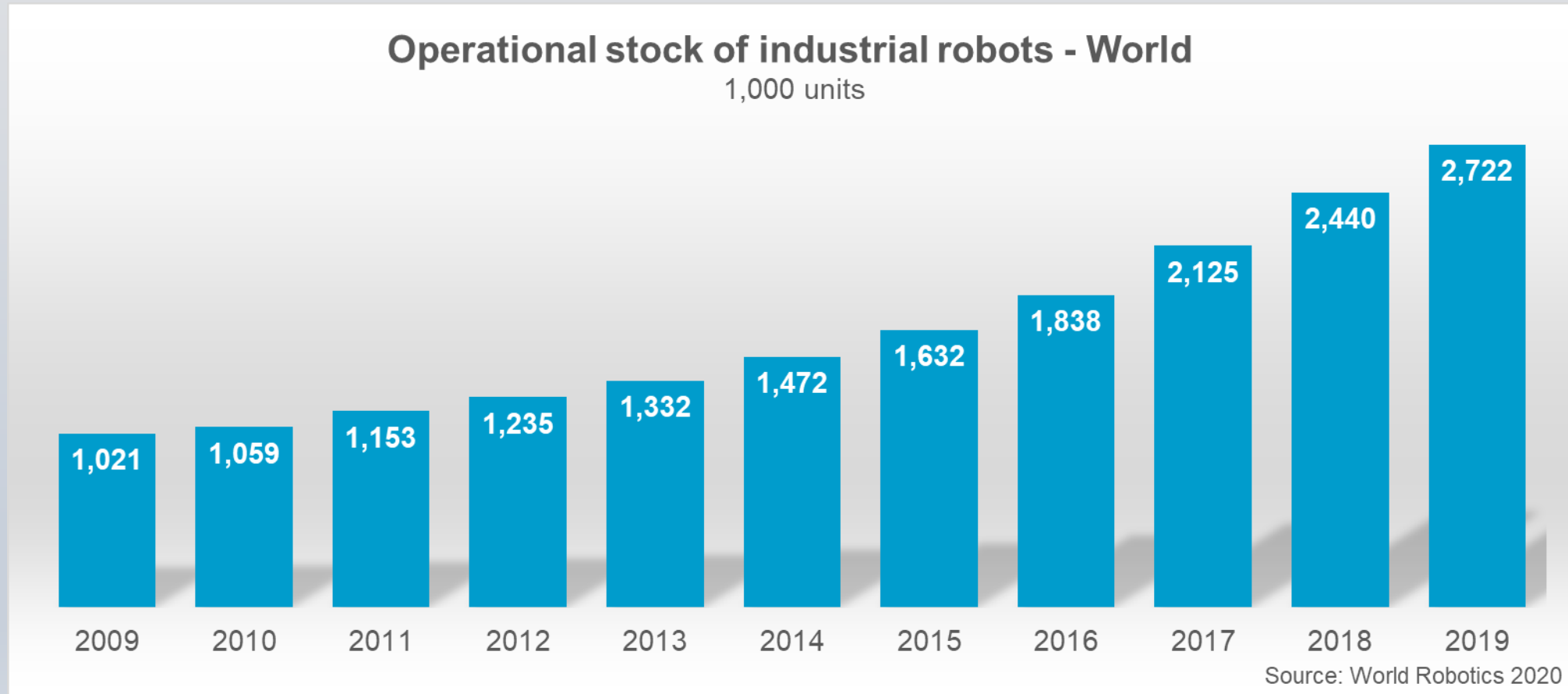
- highest number ever recorded
- CAGR since 2014: +13%

New robots

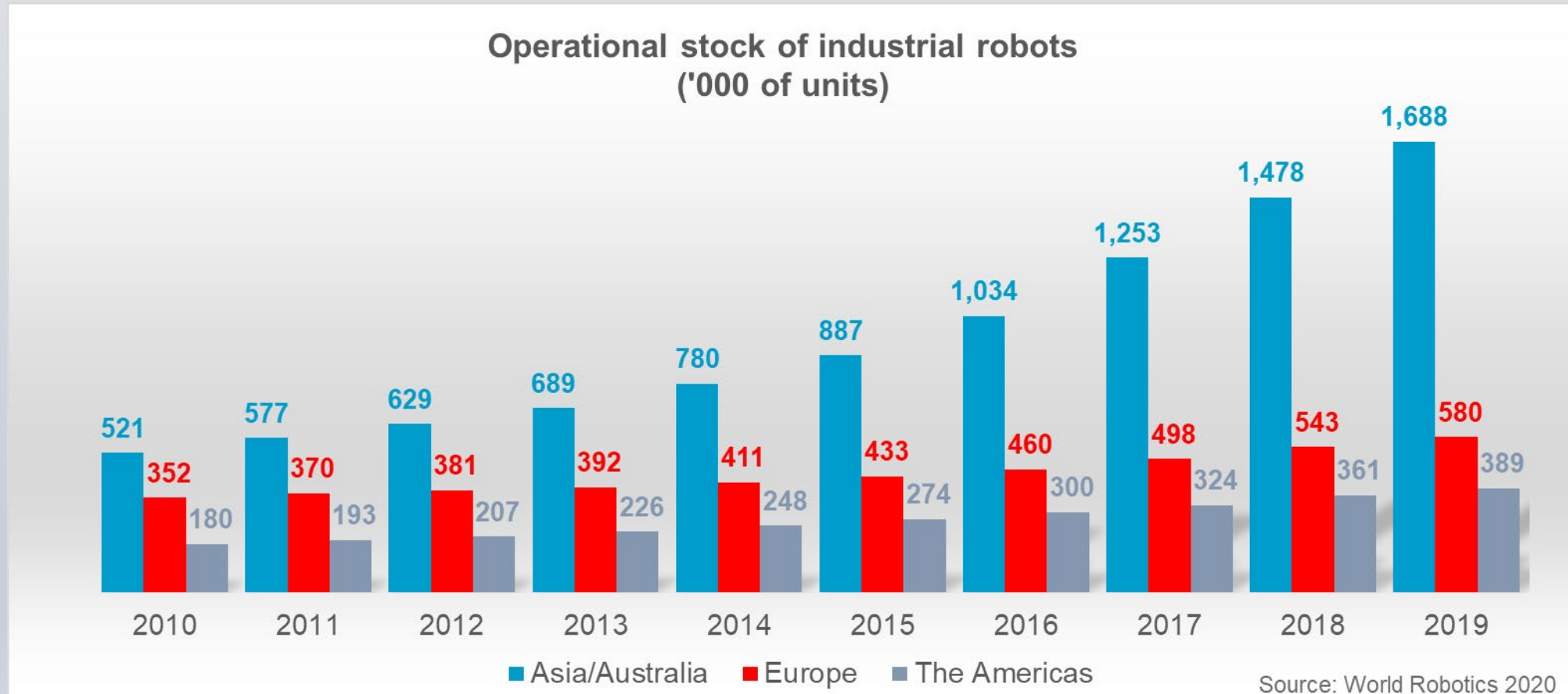
2019: 373,000 units, -12%

- third highest number ever recorded
- CAGR since 2014: +11%

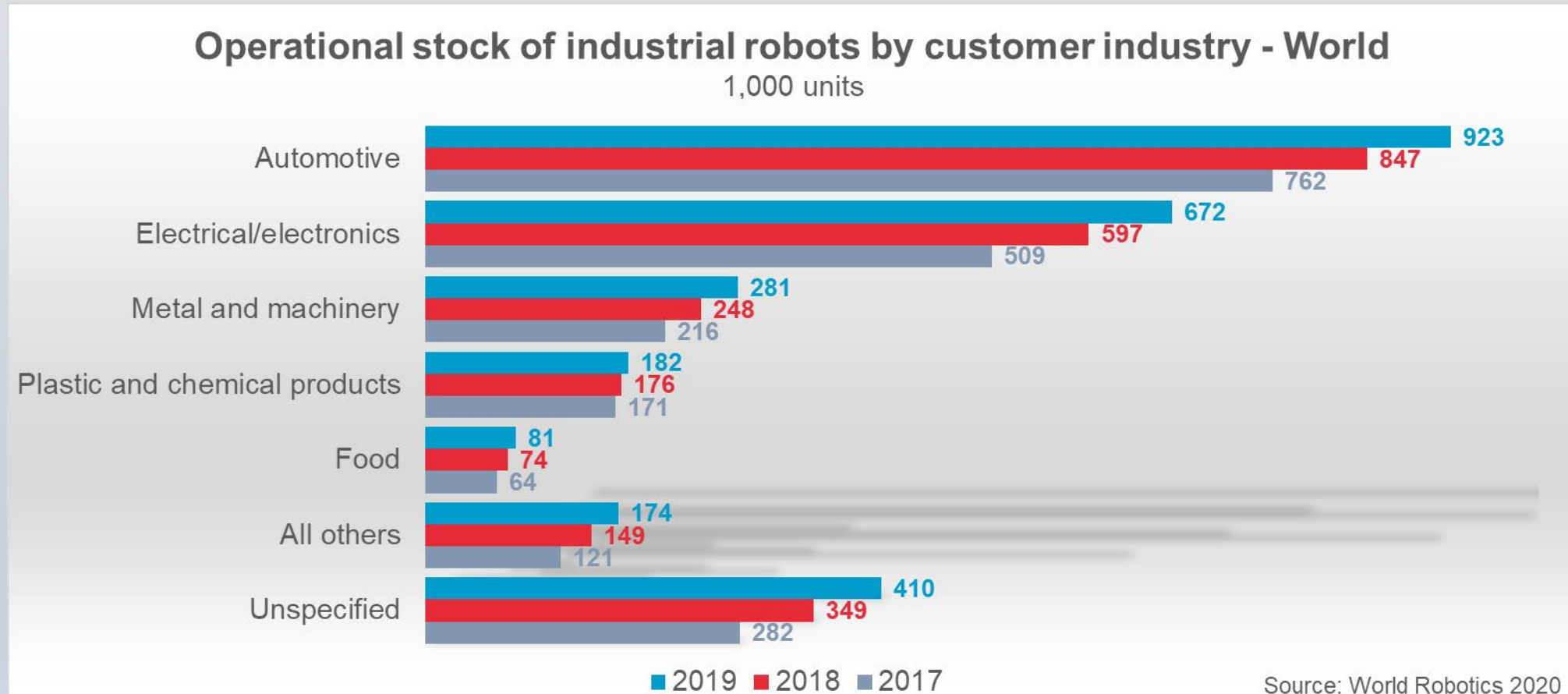
More robots deployed than ever



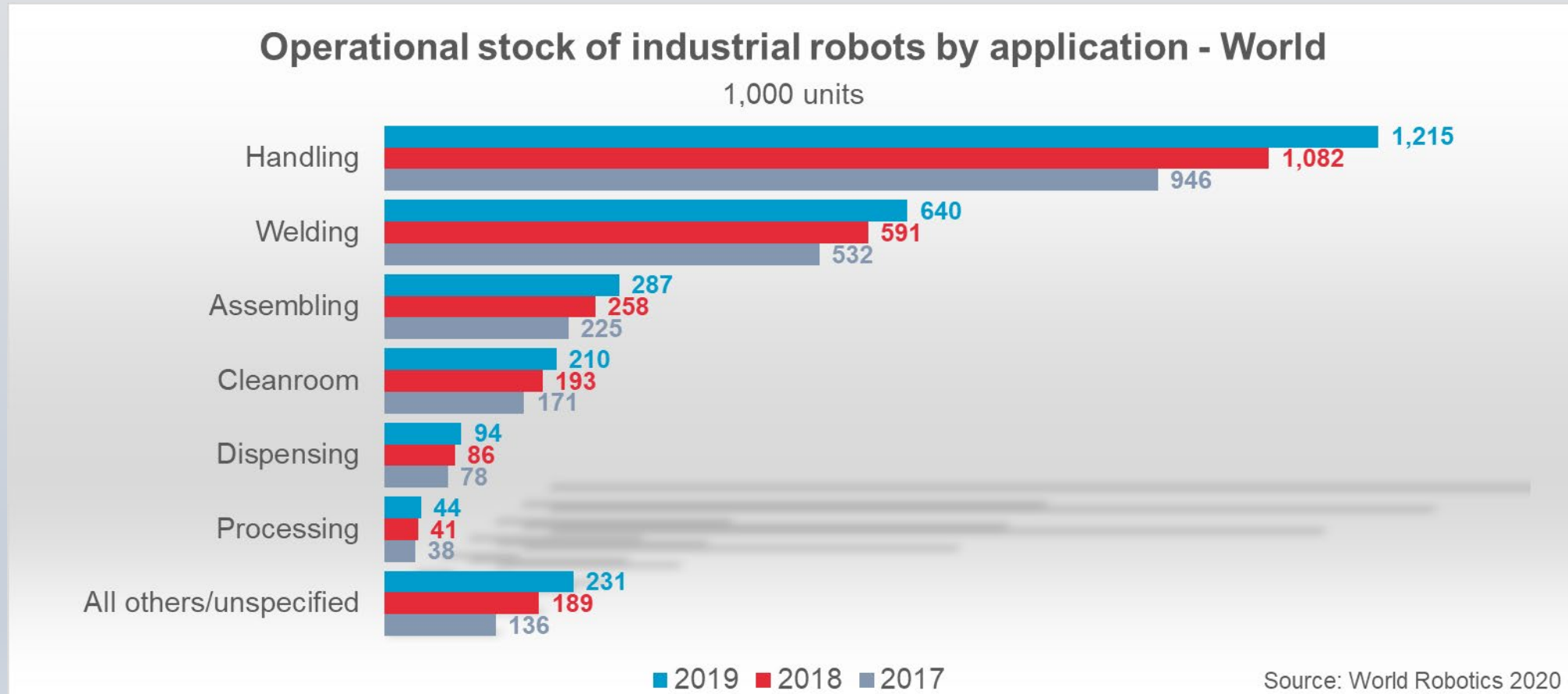
More robots deployed than ever



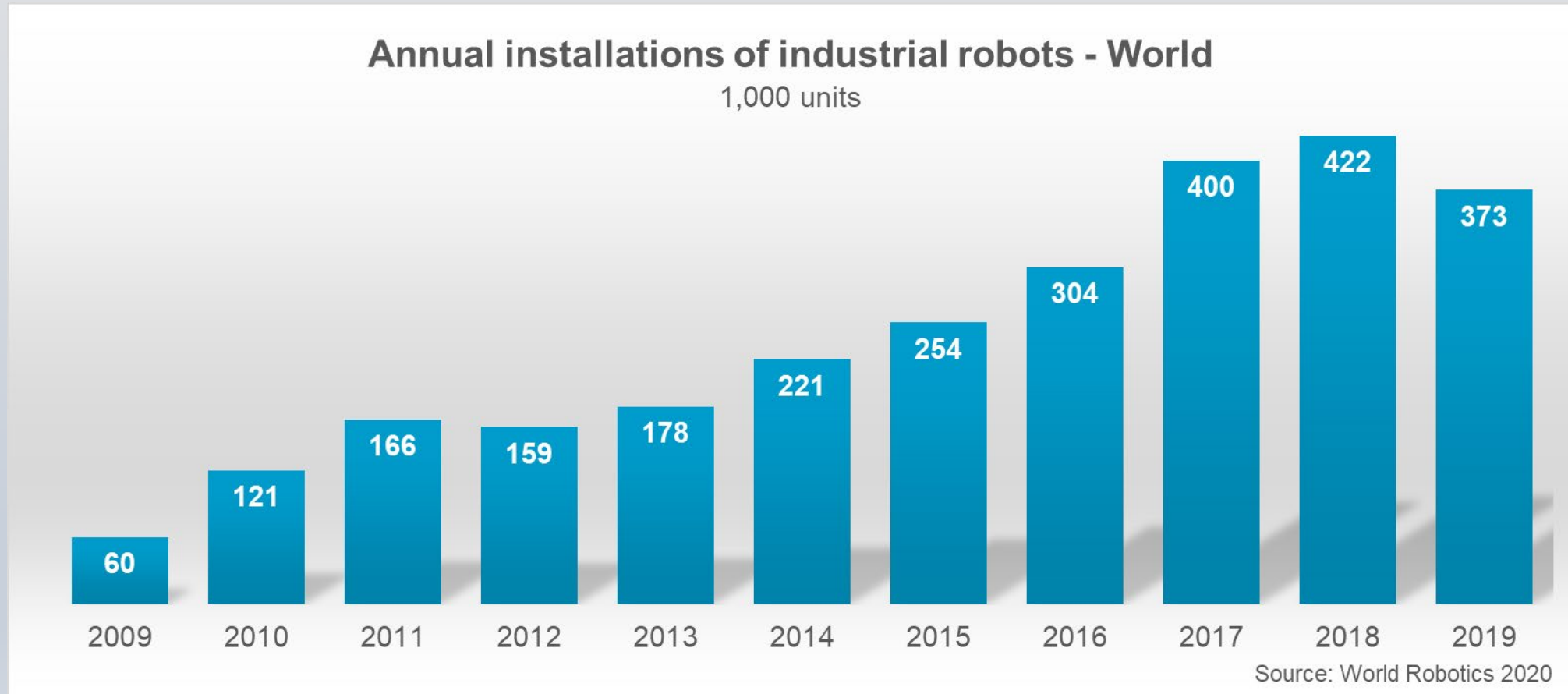
Operational stock by industry



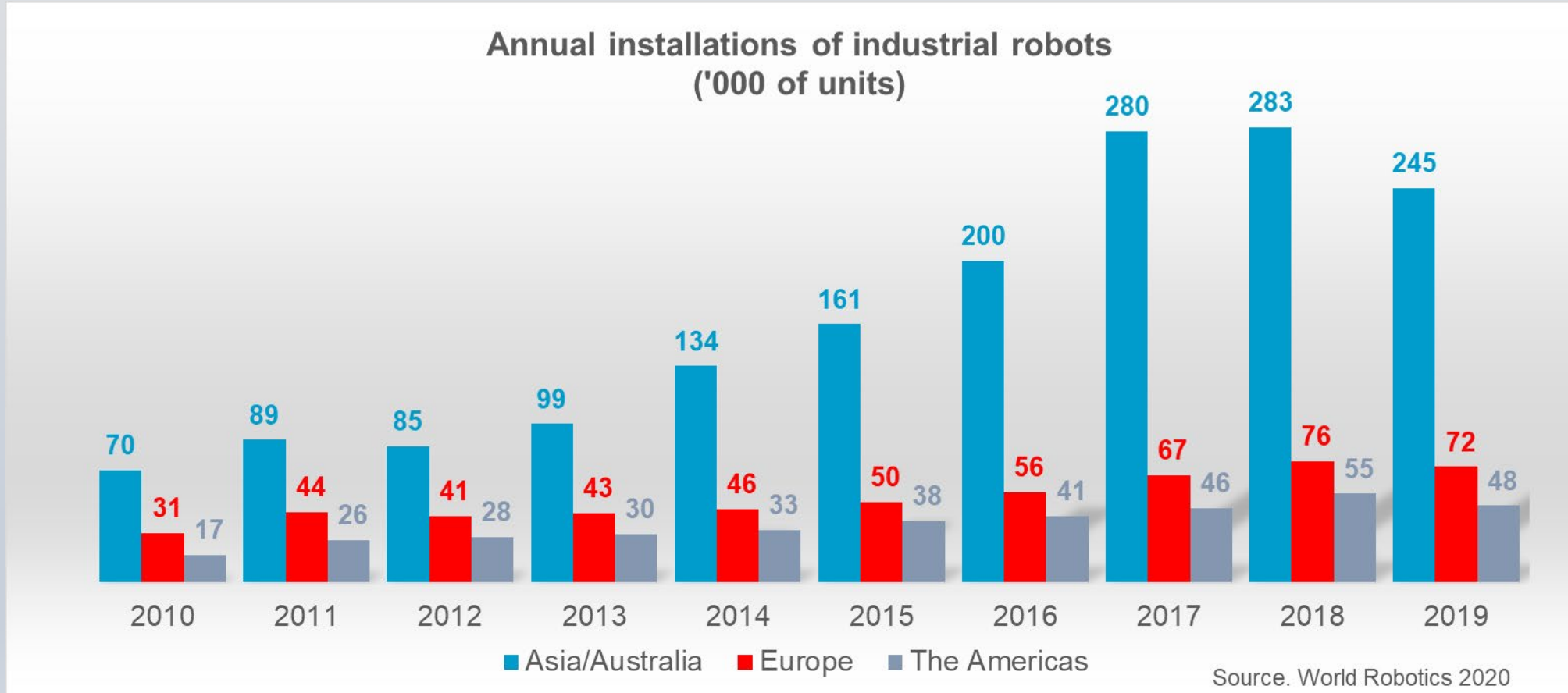
Operational stock by application



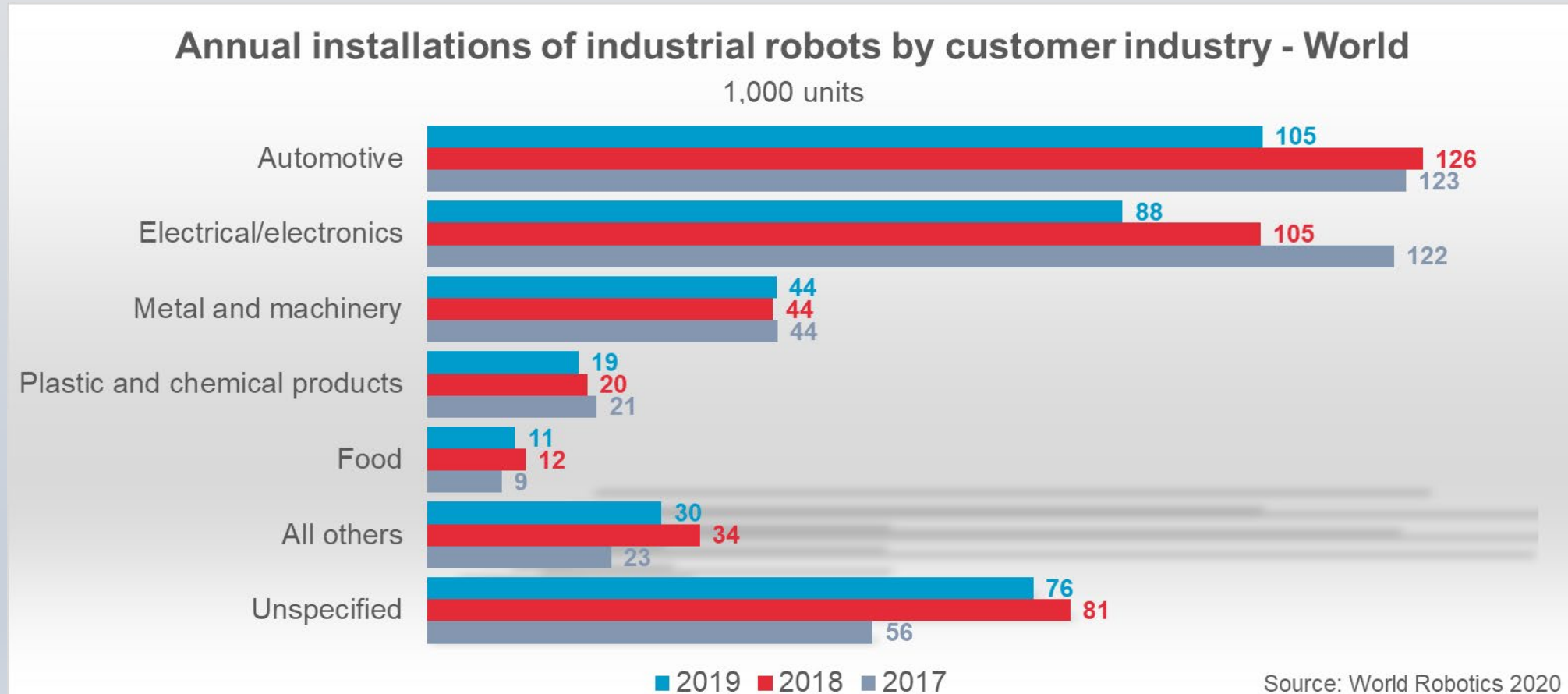
A decade of growth



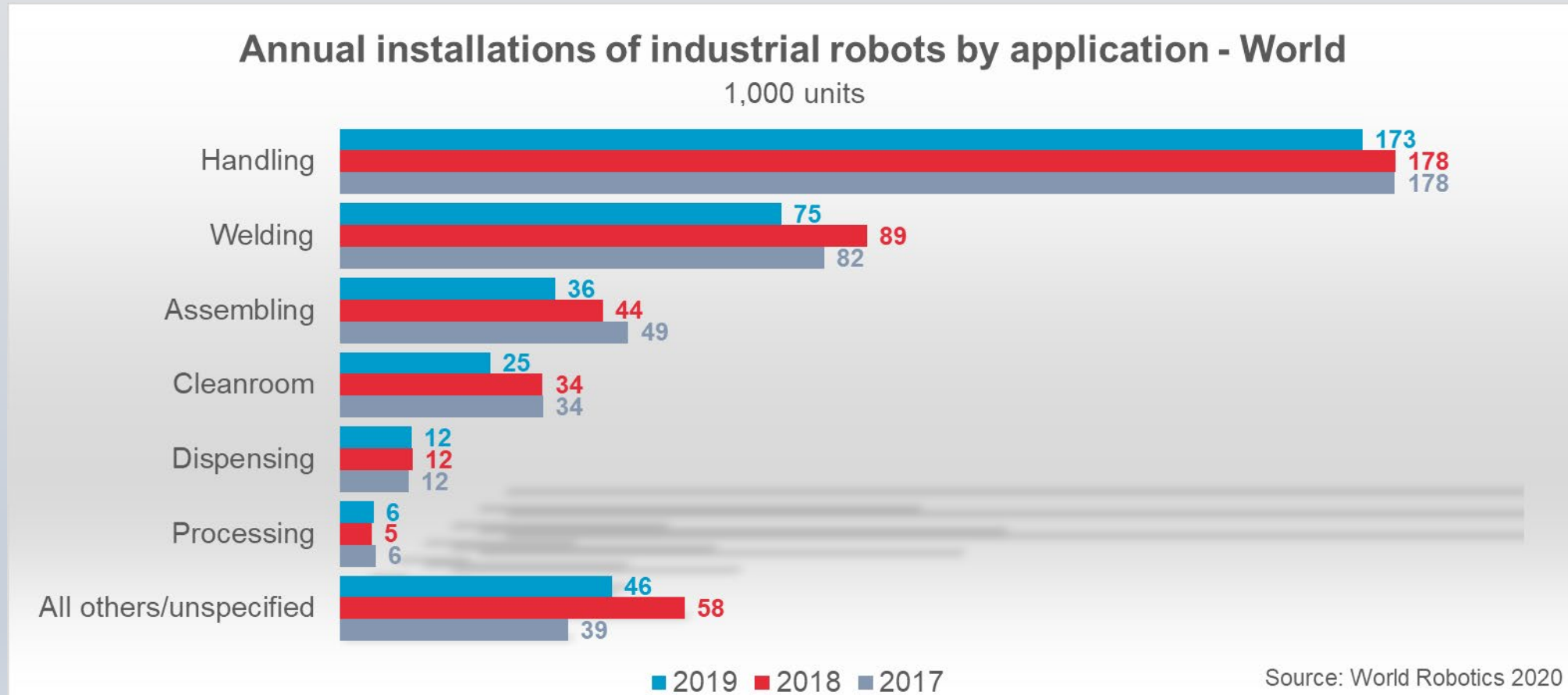
High sales volumes in all major markets



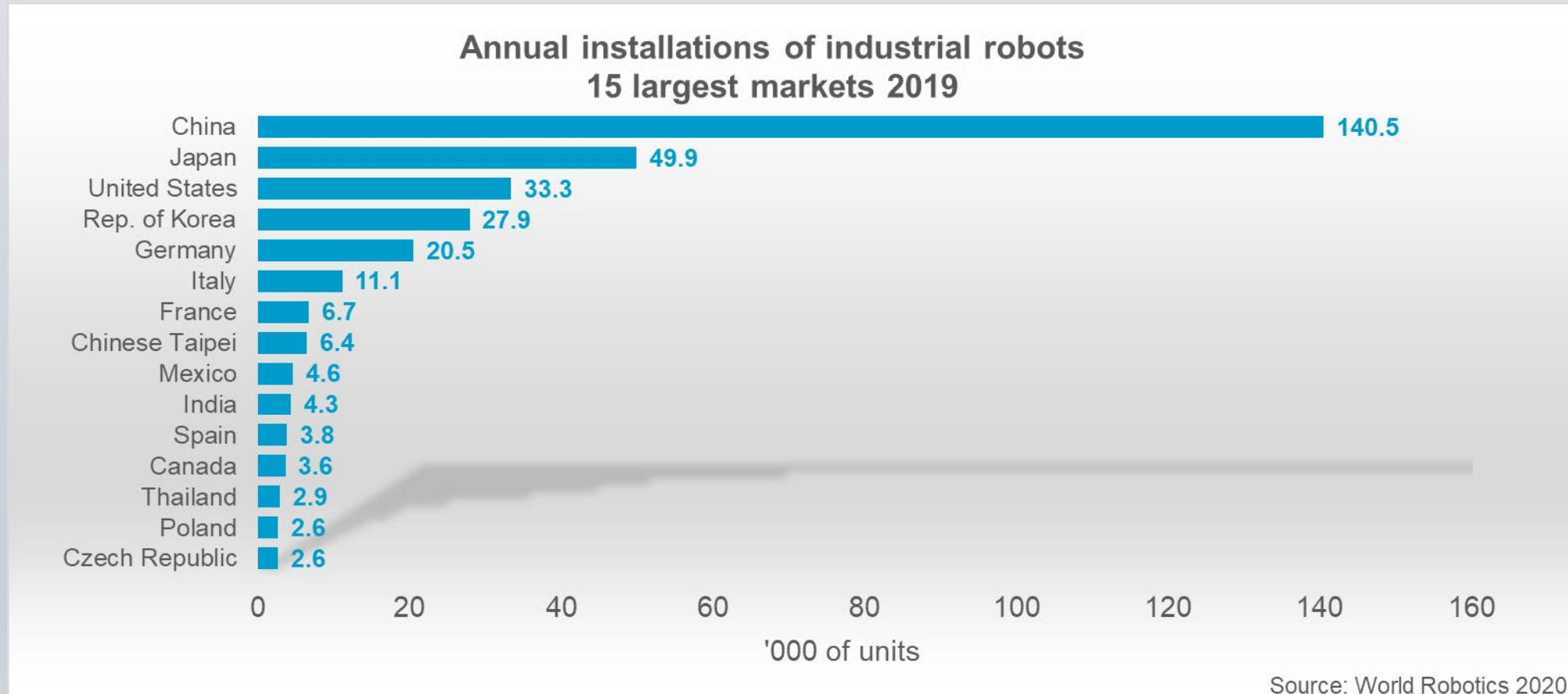
The two major customers struggled in 2019



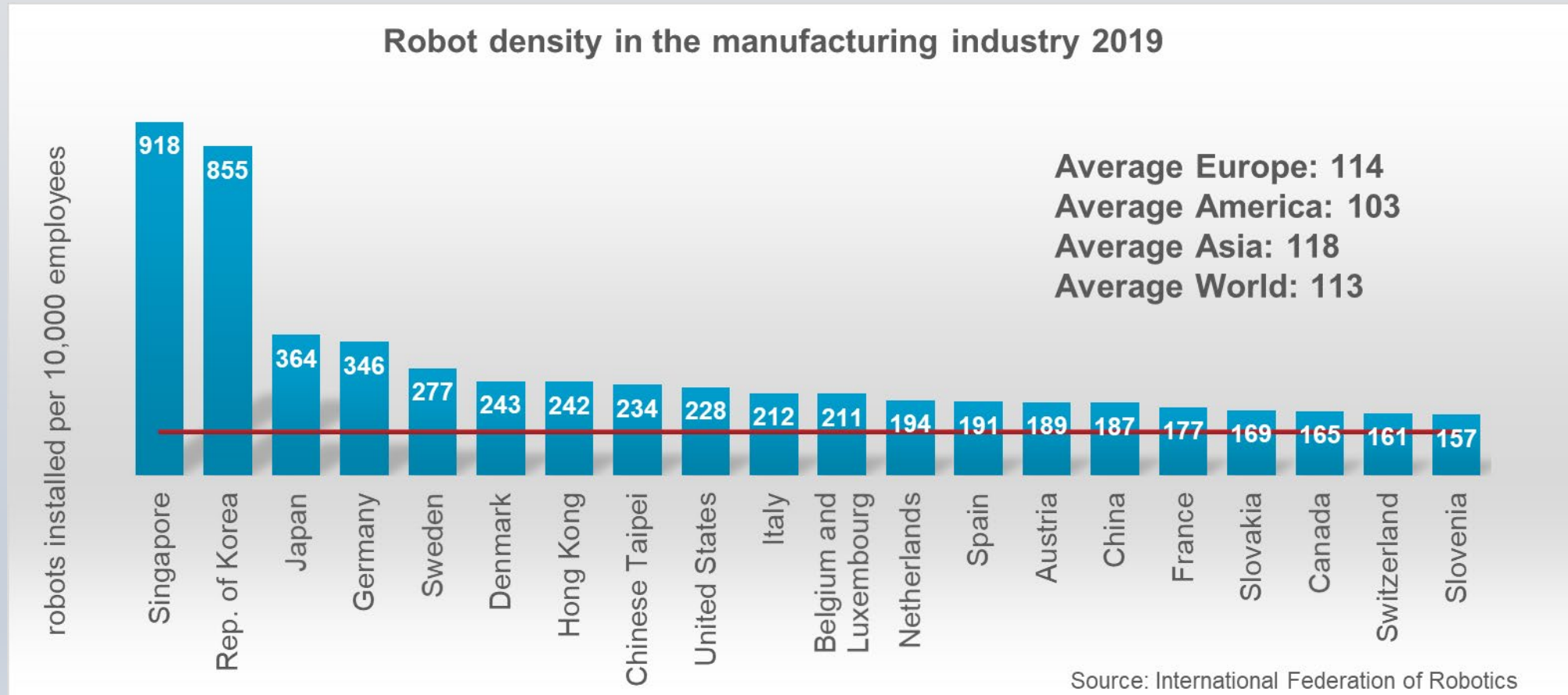
Handling remains the major application



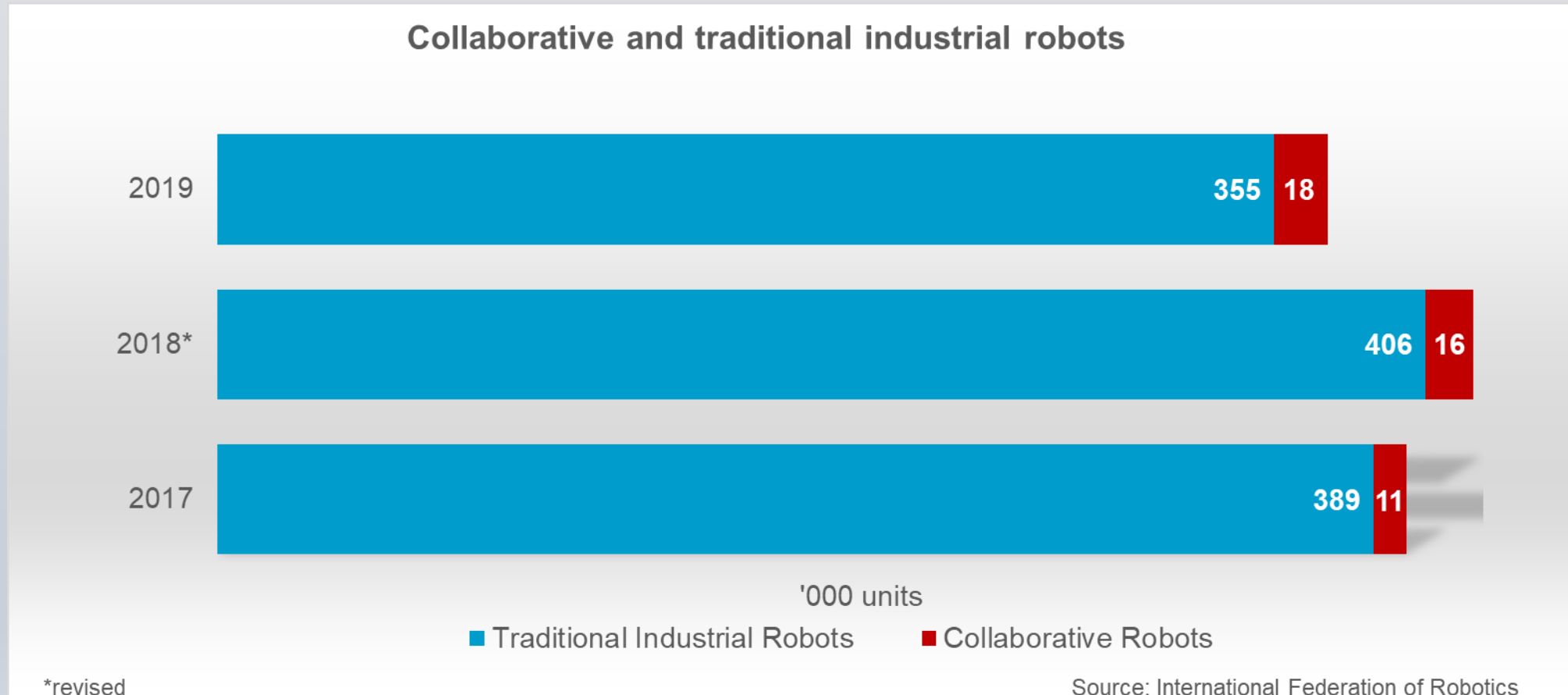
China remains the main end user of industrial robots



Singapore and Rep. of Korea with highest robot density



Collaborative robots: sales volume growing



Covid-19: a digitalization booster

Today

- ✓ Electronics industry seems to be a winner of social distancing
- ✓ Increased demand in new applications like healthcare and for the production of personnel protective equipment
- ✓ Good opportunity for modernization and digitalization of production
- Deferred investments, plummeted consumer demand and other demand-side issues
- Travel restrictions, disrupted supply chains and other supply-side issues
- Adaption to the 'new normal'
- Non-Covid issues remain: automotive transition, political headwinds

Recovery expected for 2021

Tomorrow

- ✓ Catch-up effects
 - ✓ Robots make production resilient
 - ✓ Many governments support investment in modern production technology
 - ✓ Geographical diversification of supply chains, including reshoring/repatriation
-
- Recovery likely to happen at different times in different markets
 - 2021 will see recovery
 - May take until 2022 or 2023 to reach pre-crisis level

World Robotics

Service Robots

2020



Statistics, Market Analysis and Forecasts

Personal/Domestic Service Robots

Value of Sales:

2019: USD 5.7bn, +20%

2020: USD 6.5bn, +15%

2023: USD 12.1bn, +23% (CAGR)

Unit Sales:

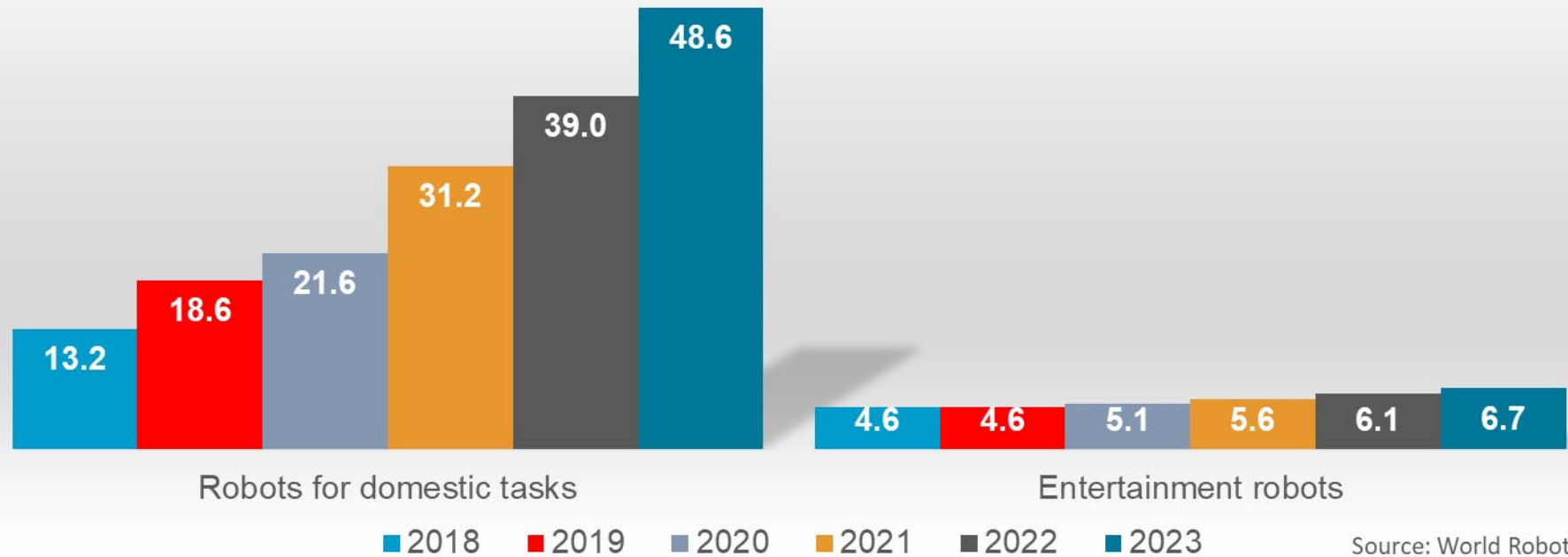
2019: 23.2 million units, +34%

2020: 26.7 million units, +15%

2023: 55.3 million units, +27% (CAGR)

Vacuuming and floor cleaning: a task for robots

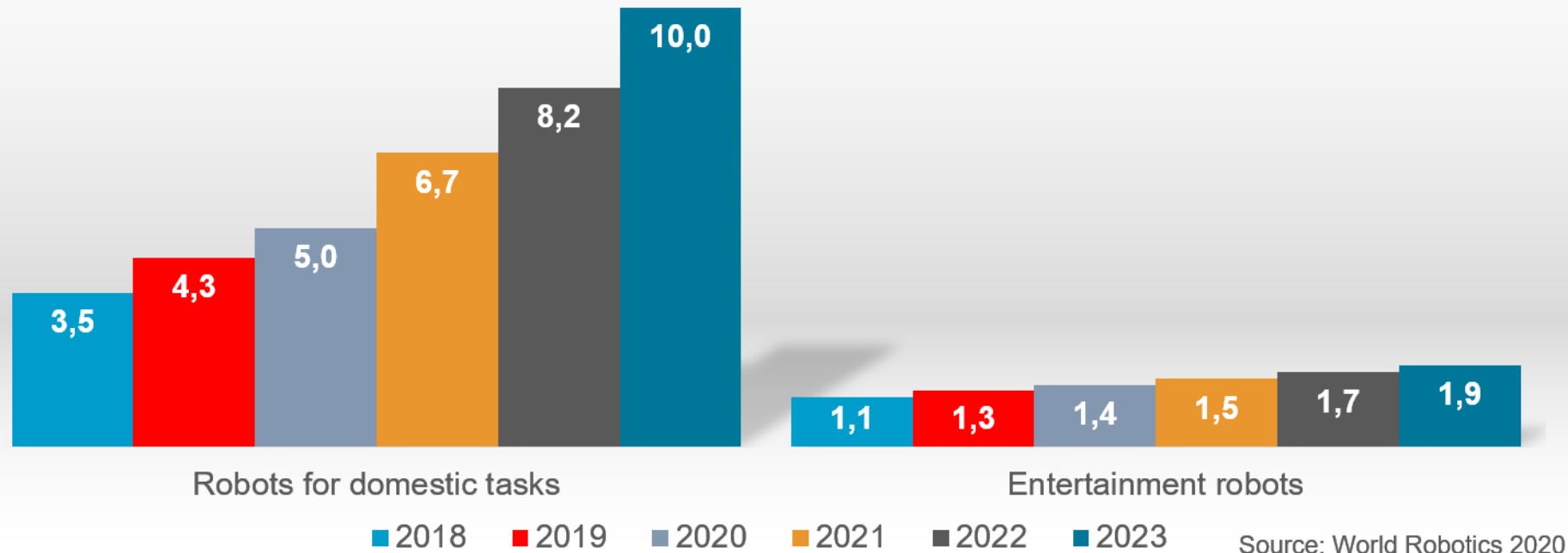
Service robots for personal/domestic use.
Unit sales 2018 and 2019, potential development 2020-2023
millions of units



Source: World Robotics 2020

Steady growth of turnover expected

Service robots for personal/domestic use.
Value of sales 2018 and 2019, potential development 2020-2023
billions of USD



World Robotics

Service Robots

2020



Statistics, Market Analysis and Forecasts

Professional Service Robots

Value of Sales:

2019: USD 11.2bn, +32%

2020: USD 13.9bn, +24%

2023: USD 27.7bn, +26% (CAGR)

Unit Sales:

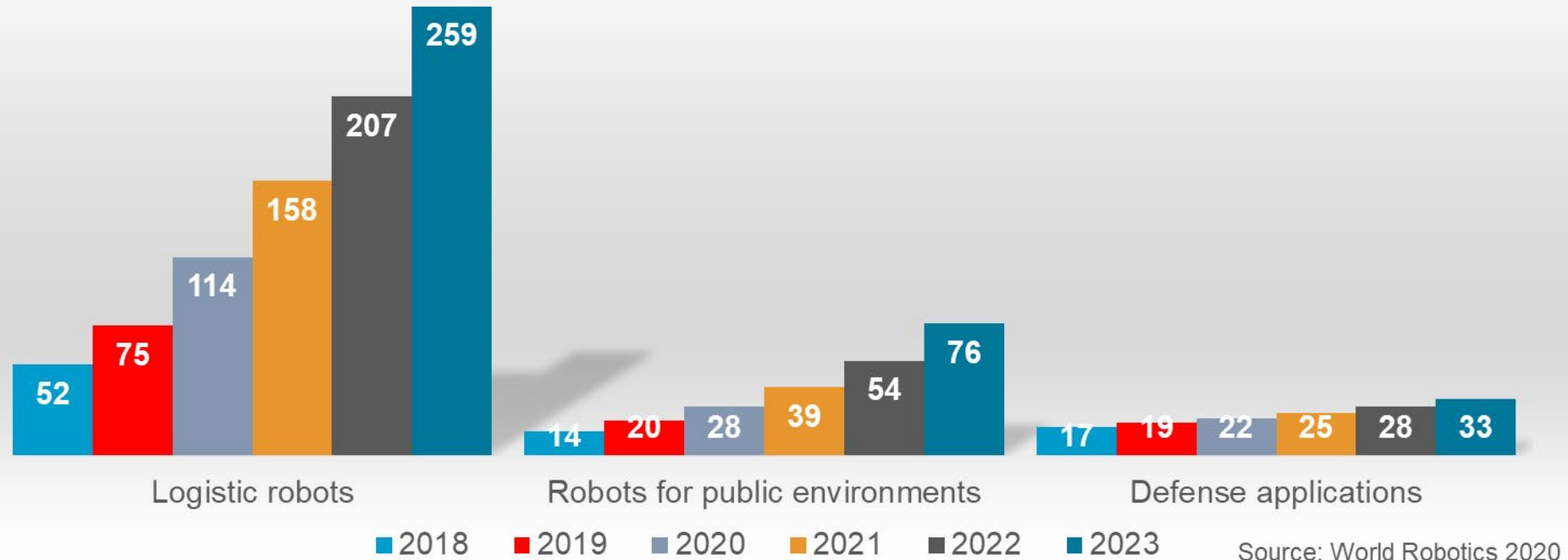
2019: 173,000 units, +32%

2020: 240,000 units, +38%

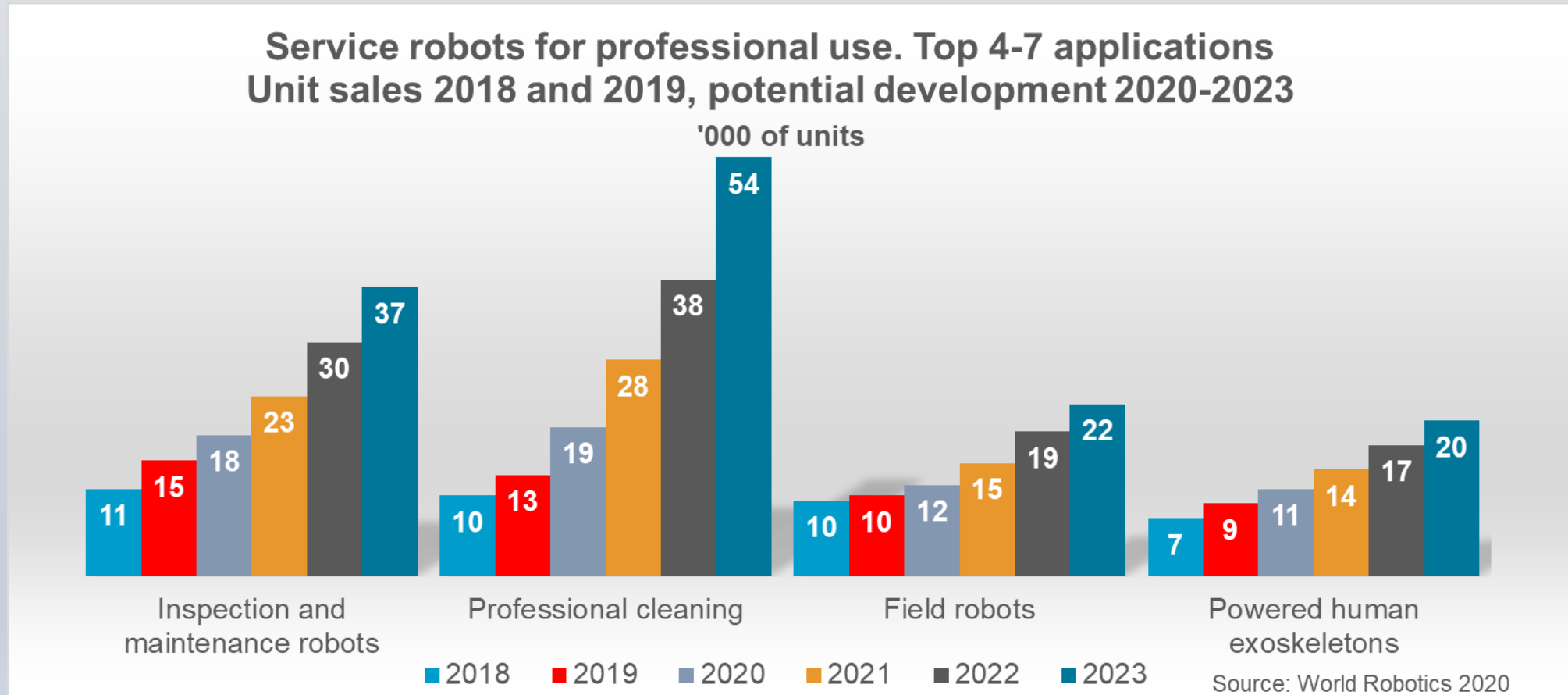
2023: 537,000 units, +31% (CAGR)

Robots in logistics are still the growth drivers

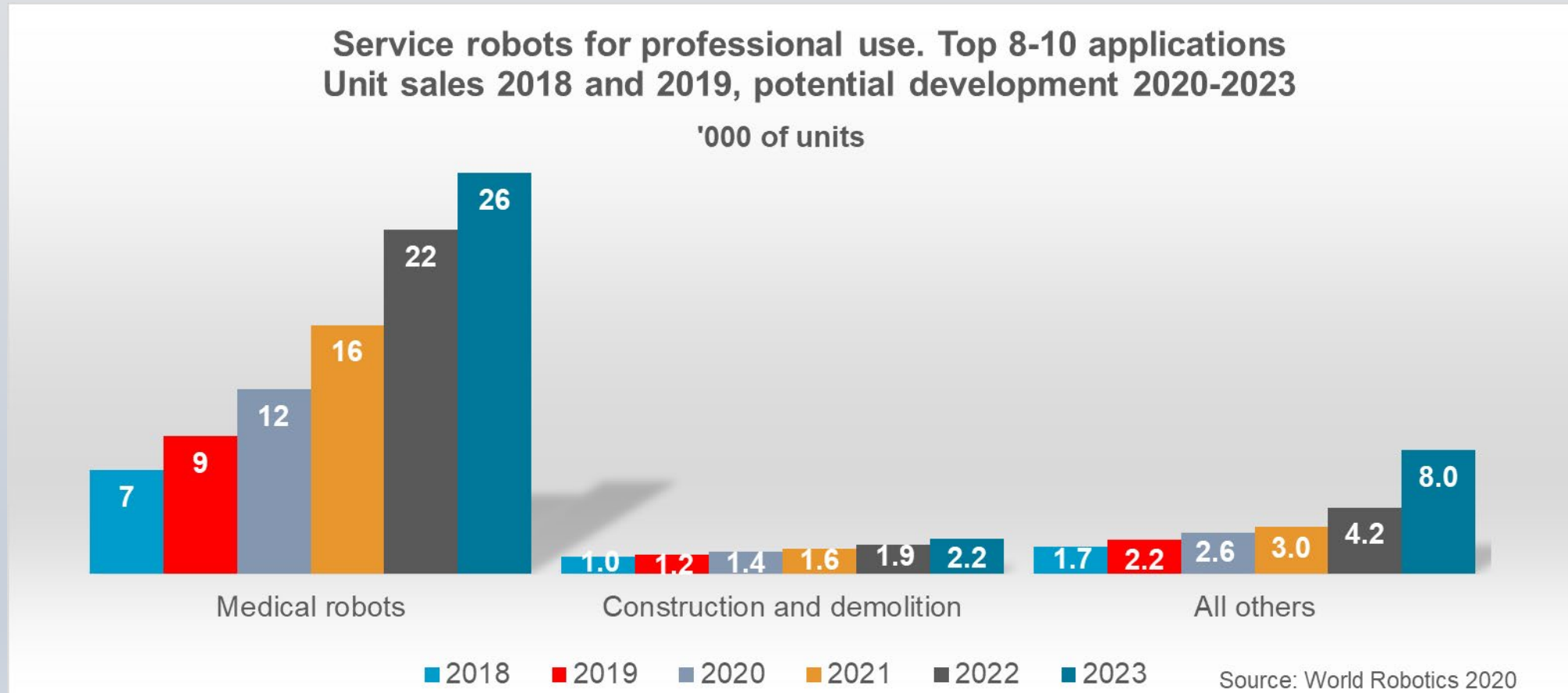
Service robots for professional use. Top 3 applications
Unit sales 2018 and 2019, potential development 2020-2023
'000 of units



Professional cleaning on the way to a top 3 application



Medical robots: growth expected as patents expire



World Robotics

Service Robots

2020



Statistics, Market Analysis and Forecasts

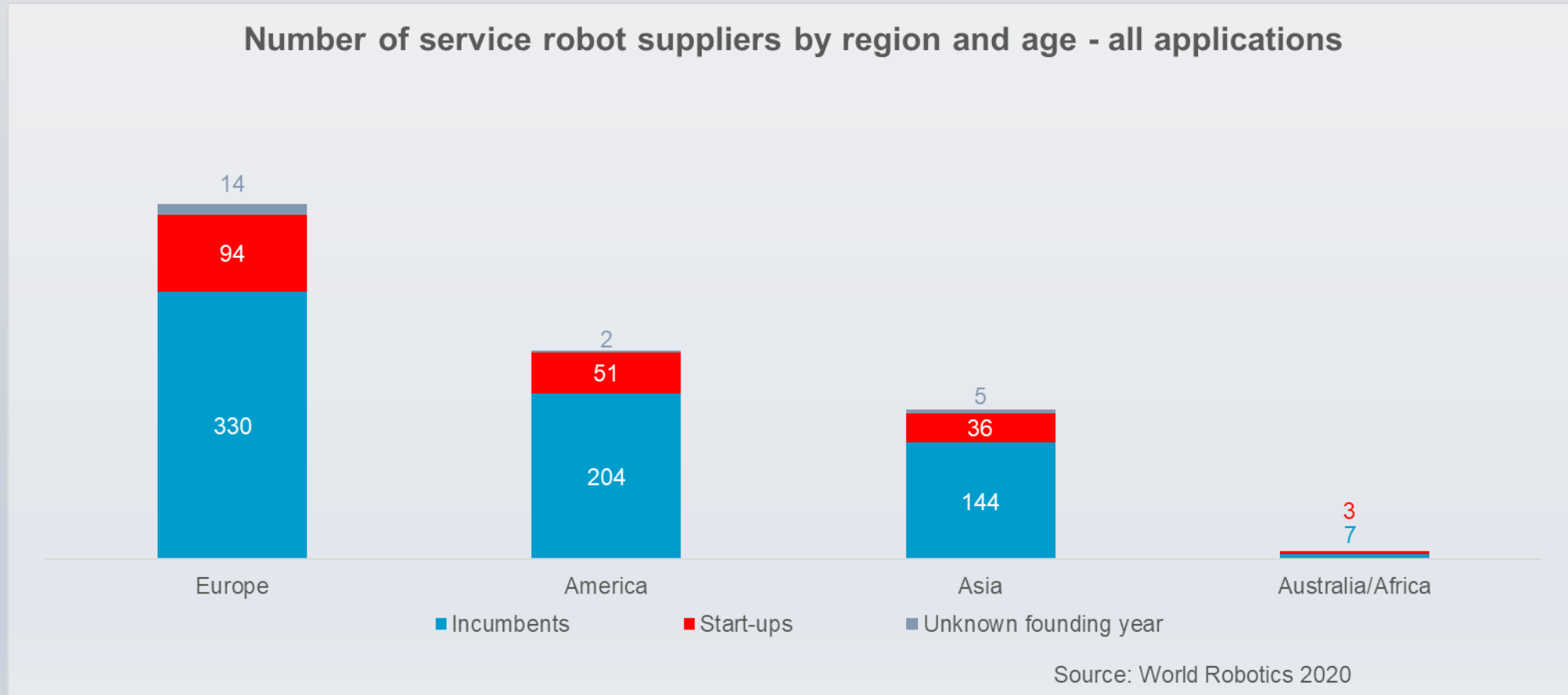
Every 5th service robot supplier is a start-up

- 889 **service robot** suppliers
- 183 start-ups (est. 2015 or later)

- 728 **professional service robot** suppliers
- 155 start-ups

- 237 **personal/domestic service robot** suppliers
- 39 start-ups

Global distribution of service robot suppliers



Technology & application trends in service robotics

Important markets to watch out:

- Unbroken scale-up of logistic systems (AGV, AMR)
- Mergers & acquisitions activities, e.g. in medical robotics
- Heavy construction machinery become robotized allowing multi-machine operation by one single person
- Information interaction (telepresence, advisory); >30 new disinfection robot models in 2020
- Covid-19 raised attention on healthcare robots

Major Technology Accelerators

- Cloud technologies and 5G: e.g., remote procedures using surgical robots and 5G in China
- Business models like Robot-as-a-Service lower the entrance level, especially in new markets
- Standardization & “platformization”: e.g. for peripherals (app store), sales platform, plug& play

Long-run perspectives for robotics remain excellent

- ✓ There are still many “4d” (*dull, dirty, dangerous and/or delicate*) tasks that could be done by robots, improving worker health, safety and job satisfaction.
- ✓ Ageing societies will feel additional need to relieve employees from physical tasks.
- ✓ Technological development will further increase the ROI in robots.
- ✓ Matrix production layouts use robots for automatic workpiece transportation.
- ✓ Modern robots support a smaller carbon footprint.
- ✓ Human-robot collaborative applications will complement traditional robotics.
- ✓ “Plug and play” system integration makes deployment easier (e.g. through OPC-UA).
- ✓ Ease of programming (e.g. through demonstration) makes redeployment easier.

Thank you!

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