



**Welcome to the
IFR Press Conference
18 October 2018
Tokyo**

Agenda

Welcome

Presentation of the speakers

World Robotics 2018 Industrial Robots

- Review 2017 and forecast 2018-2021
- Main markets – customers - trends
- Robot density

World Robotics 2018 Service Robots

- Professional Service Robots
- Personal/Domestic Service Robots
- Companies

Questions



Speakers on the panel



Junji Tsuda

IFR President

Representative Director
Chairman of the Board
Yaskawa
Japan



Steven Wyatt

IFR Vice President

Group Vice President,
and Head of Marketing &
Sales Robotics, ABB
Switzerland



Gudrun Litzenberger

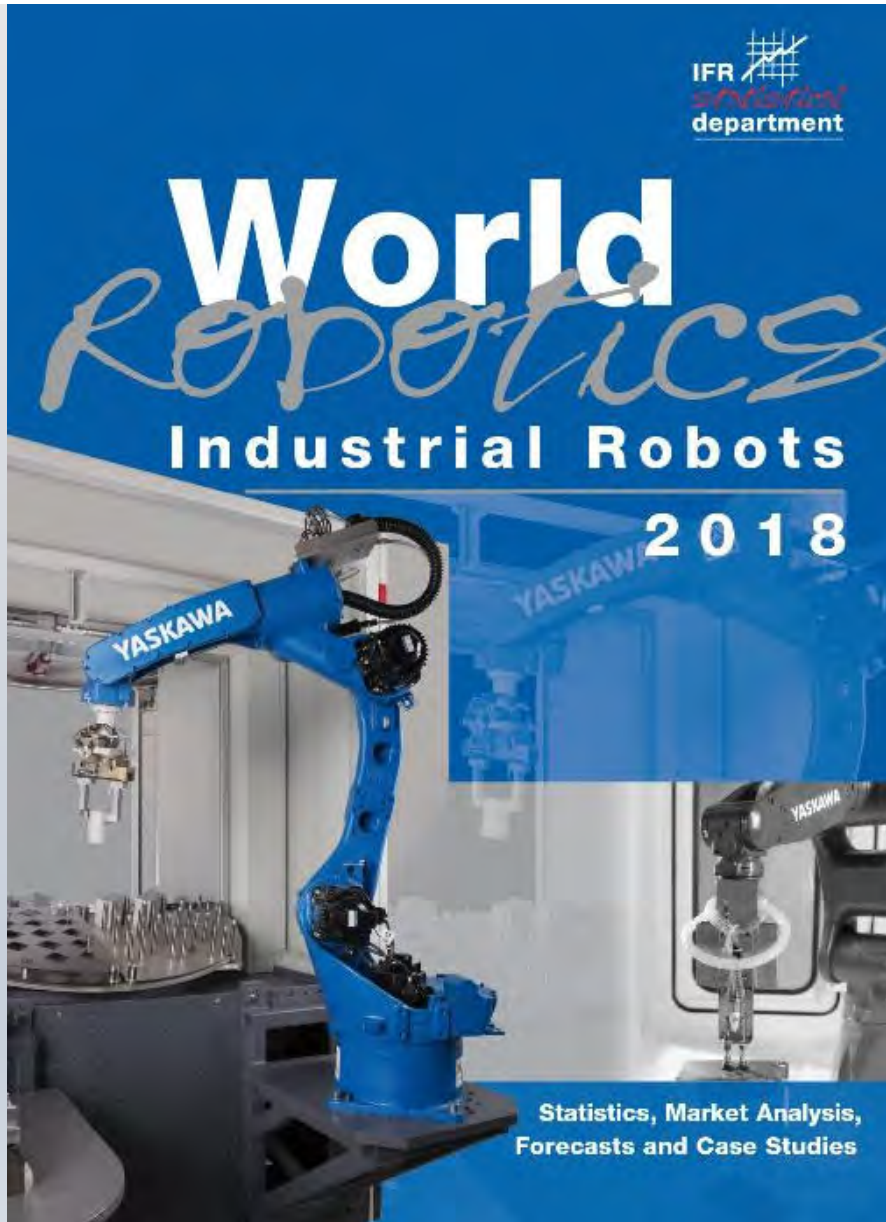
General Secretary

International Federation of Robotics
Germany

International Federation of Robotics – Representing the global robotics industry

- **Robotics turnover 2017: \$48 billion**
- **More than 50 members:**
 - National robot associations
 - R&D institutes
 - Robot suppliers
 - Integrators
- **Sponsor of the annual International Symposium on Robotics (ISR)**
- **Co-sponsor of the IERA Award**
- **Primary resource for world-wide data on use of robotics – IFR Statistical Department**





Junji Tsuda

Records, records

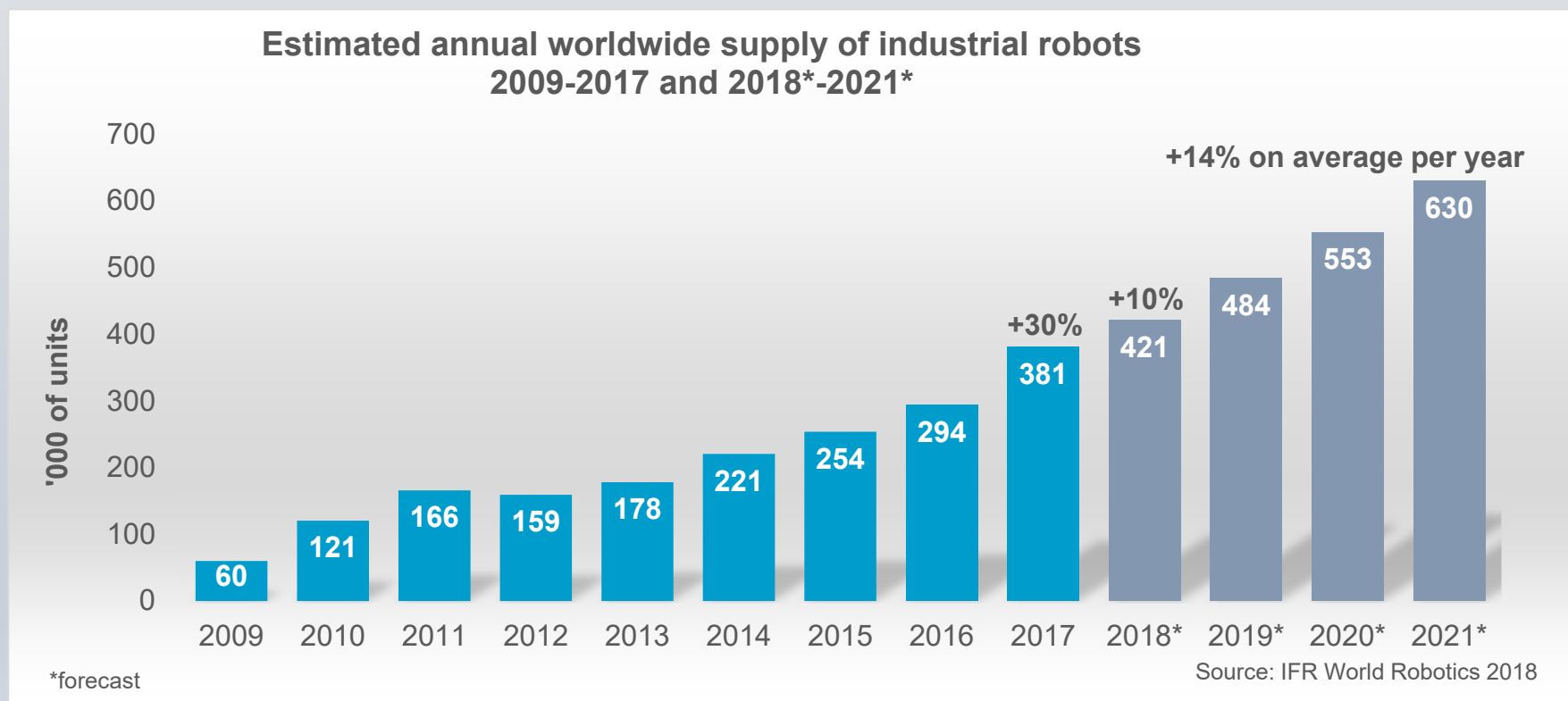
2017: 381,300 units, +30%

2018: 421,000 units, +10%

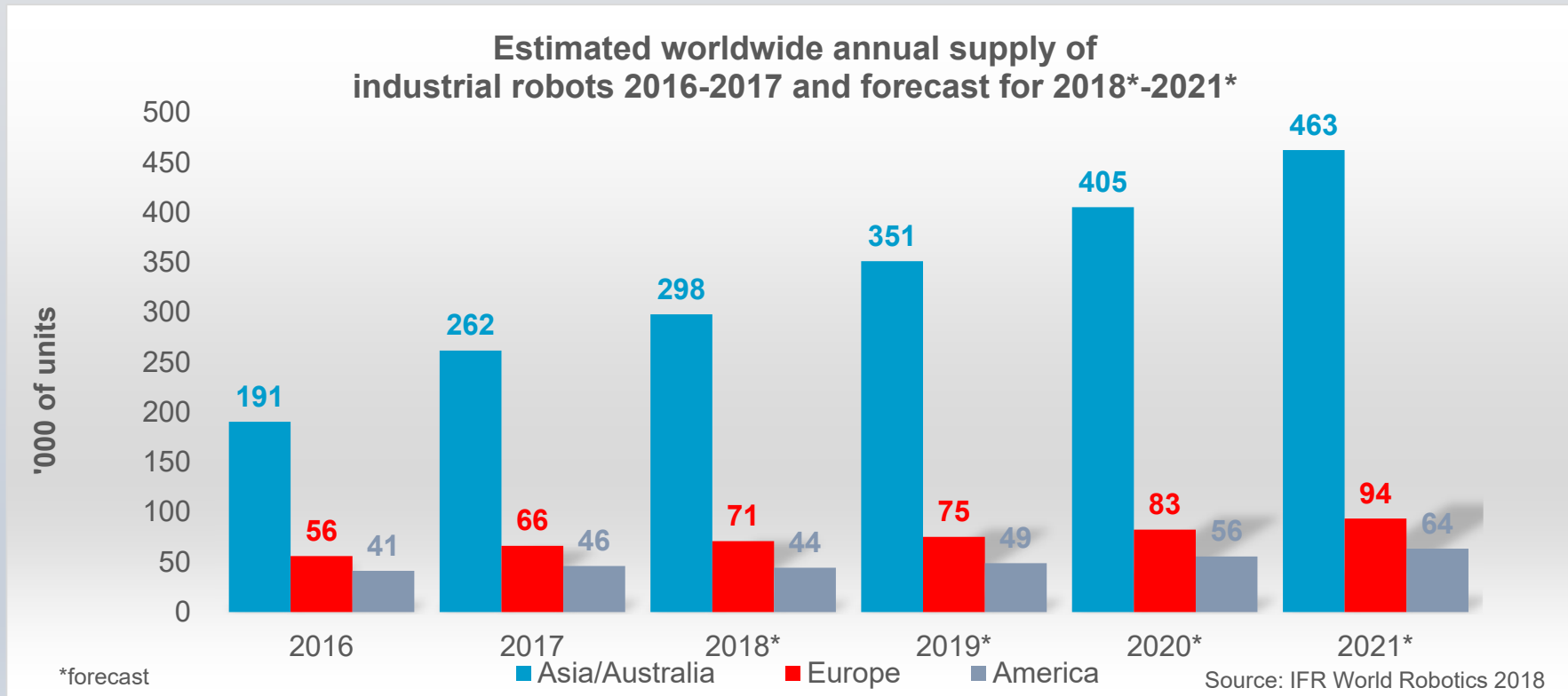
**2021: 630,000 units,
+14% on average per year**



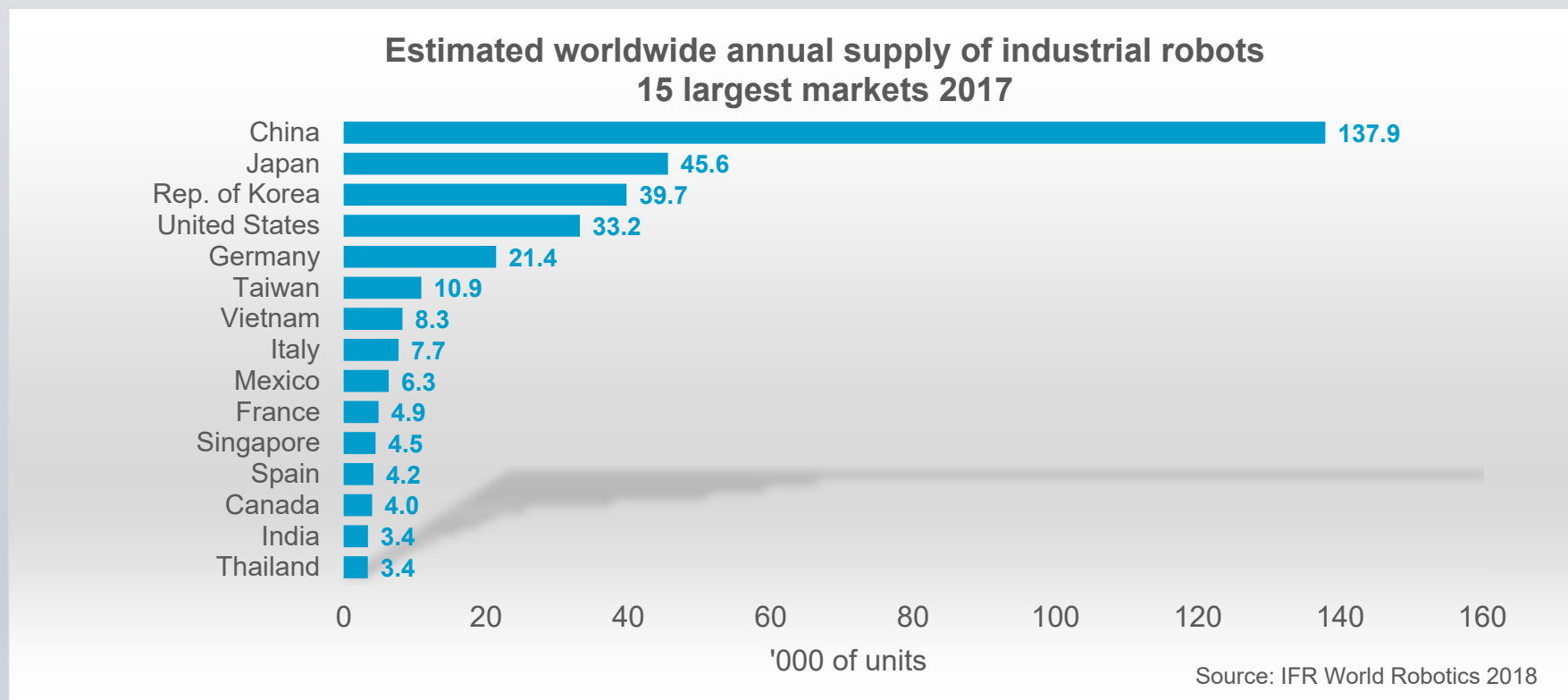
Continued record sales since 2013



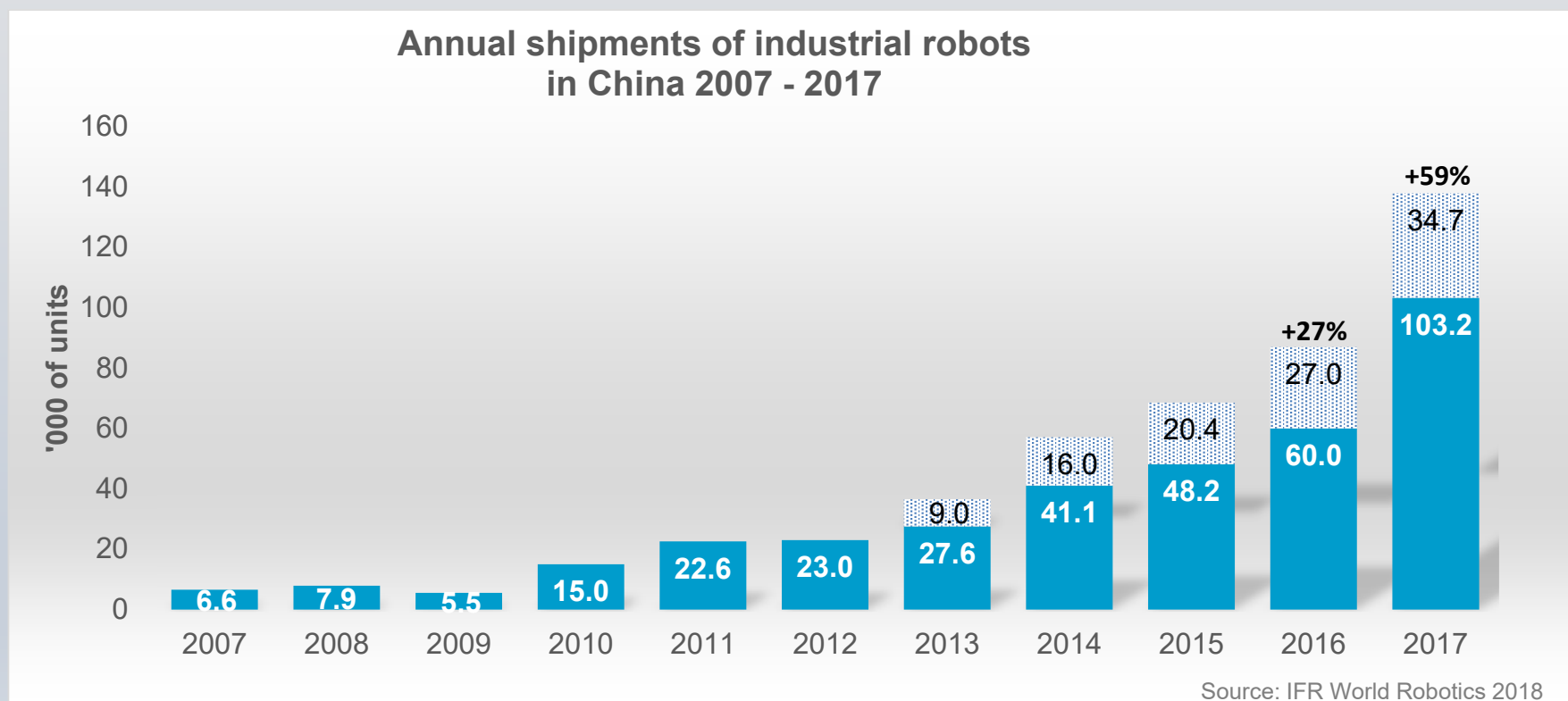
Emerging region Asia



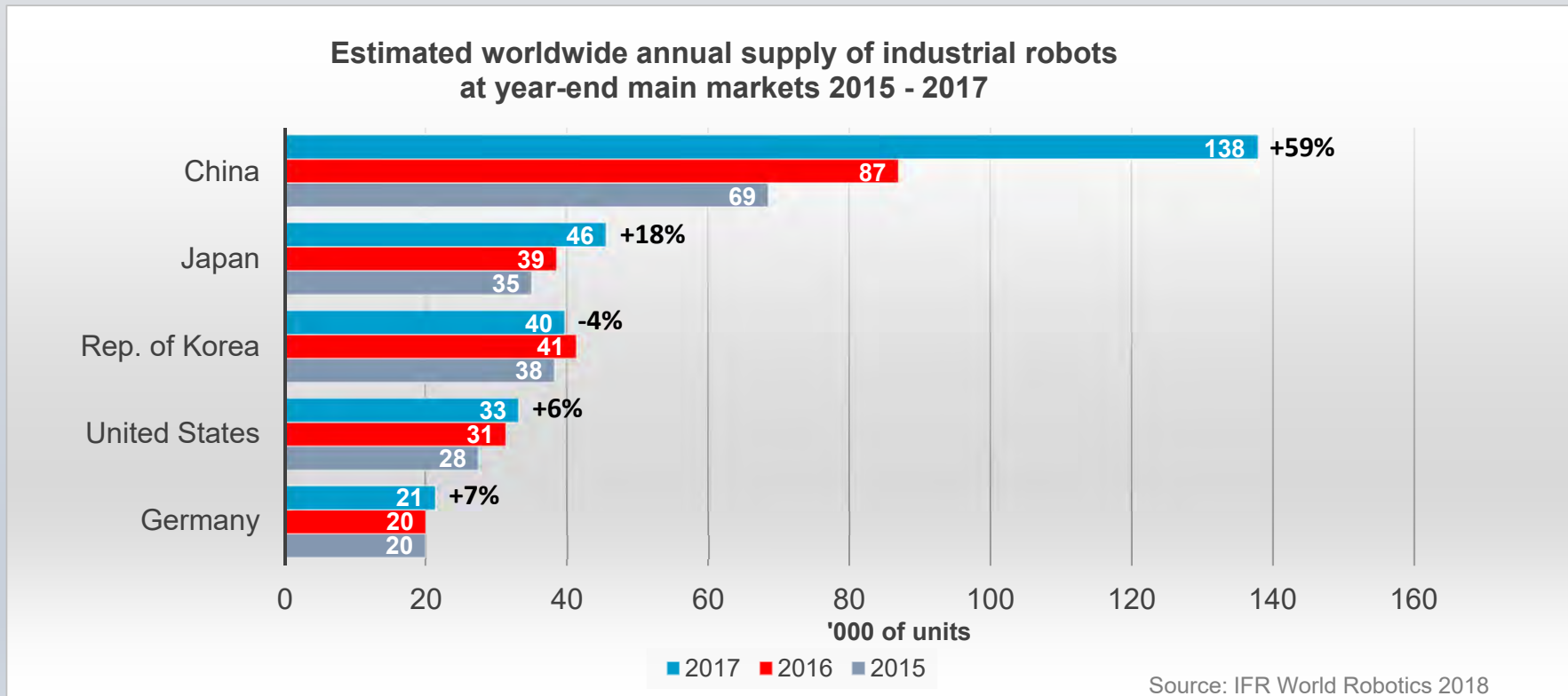
China has significantly expanded its leading position



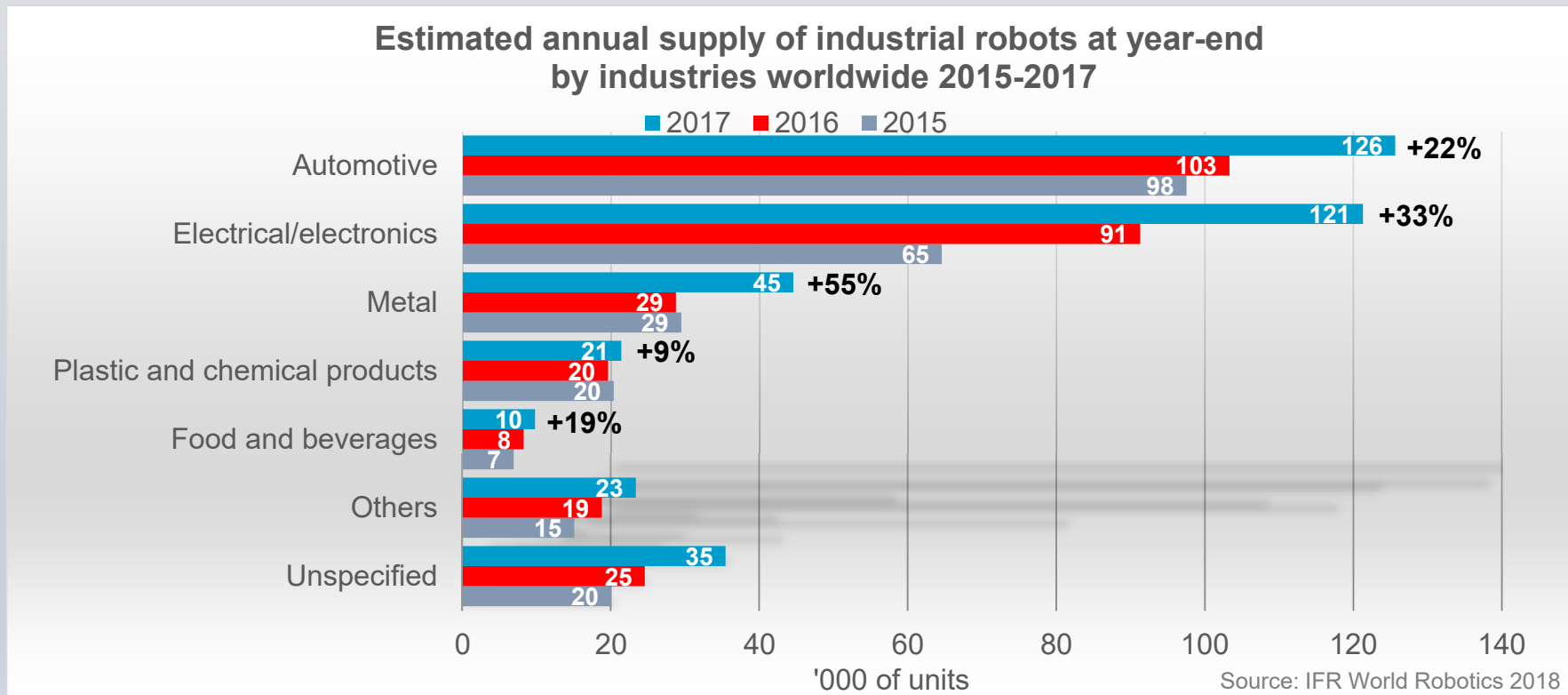
China: Strong increase of robots sales of foreign companies



Top 5 countries represent 73% of total sales in 2017



Main drivers of the growth 2017: automotive, electronics, metal



Key Drivers for Automation more relevant than ever

Shift to high mix/low volume production

Global competitiveness

Digitalization of manufacturing – Industry 4.0

Growing consumer markets

Energy efficiency-driven technology shifts

Regionalized production



Image: KUKA

Main customer: automotive industry

Transition from Internal Combustion Engines (ICE) to electric vehicles/hybrids

Increased complexity

Customization – increasing mix requires more flexible production

Automation of final assembly

Automotive parts suppliers – more SME's will use robots



Steven Wyatt

Main customer: electrical/electronics industry

**Continuously increasing demand for
batteries, chips and displays**

Short life cycles of electronic products

**High turnover of people with associated
labor shortages**

Increasing degree of robot adoption

**Higher quality demands on manufacturing
process**



Image: ABB

Robot sales will in increase in all other industries

Metal industries – more flexibility and cost efficiency

Rubber and plastics industry – more integrated manufacturing concepts

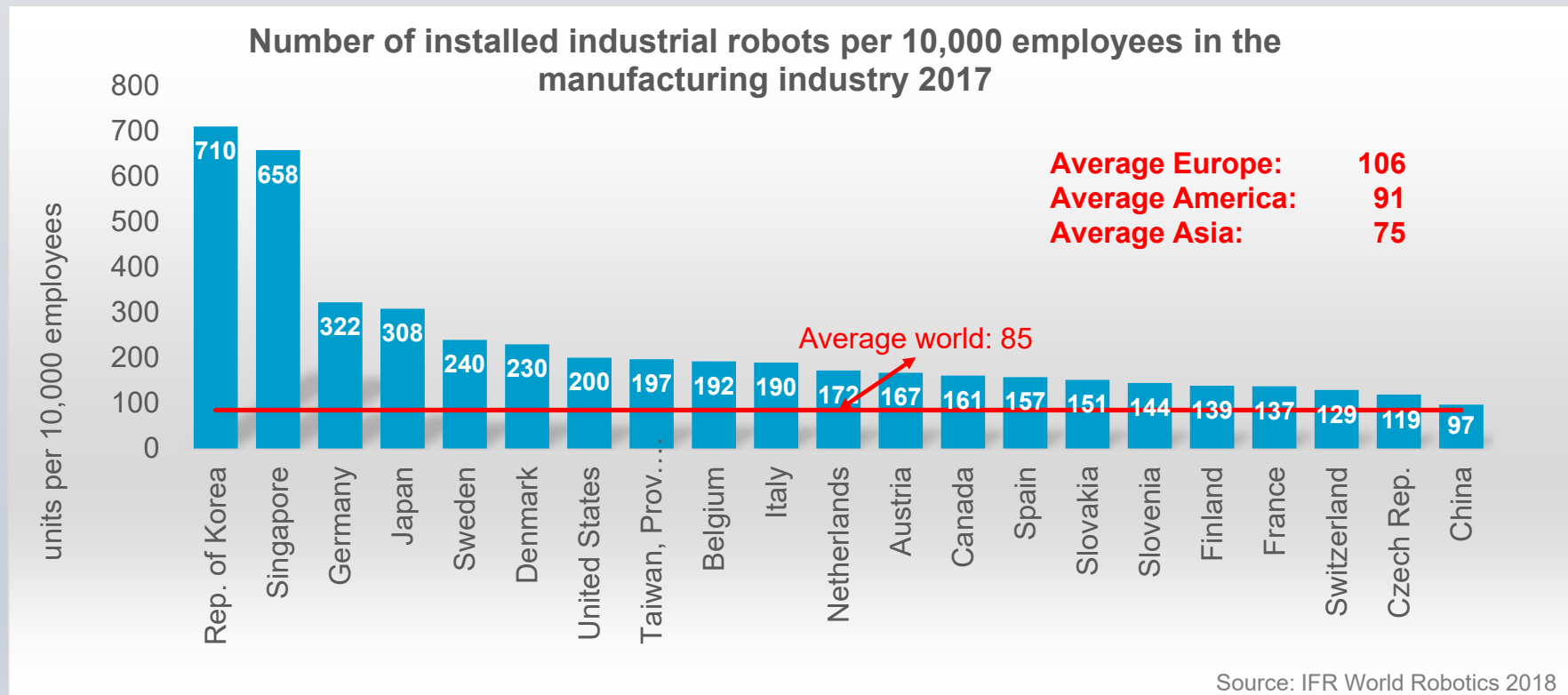
Food and beverage industry – shift to even shorter production runs

Pharmaceutical industry - improving productivity without sacrificing quality



Steven Wyatt

Highest robot density in Korea - lowest average in Asia



Technological Developments expanding Robot Adoption

Today

- More intelligent components, e.g. Smart Grippers
- Greater connectivity, e.g. “Plug & Play” interfaces and Cloud Computing
- Easier to Use, e.g. “Programming by Demonstration”

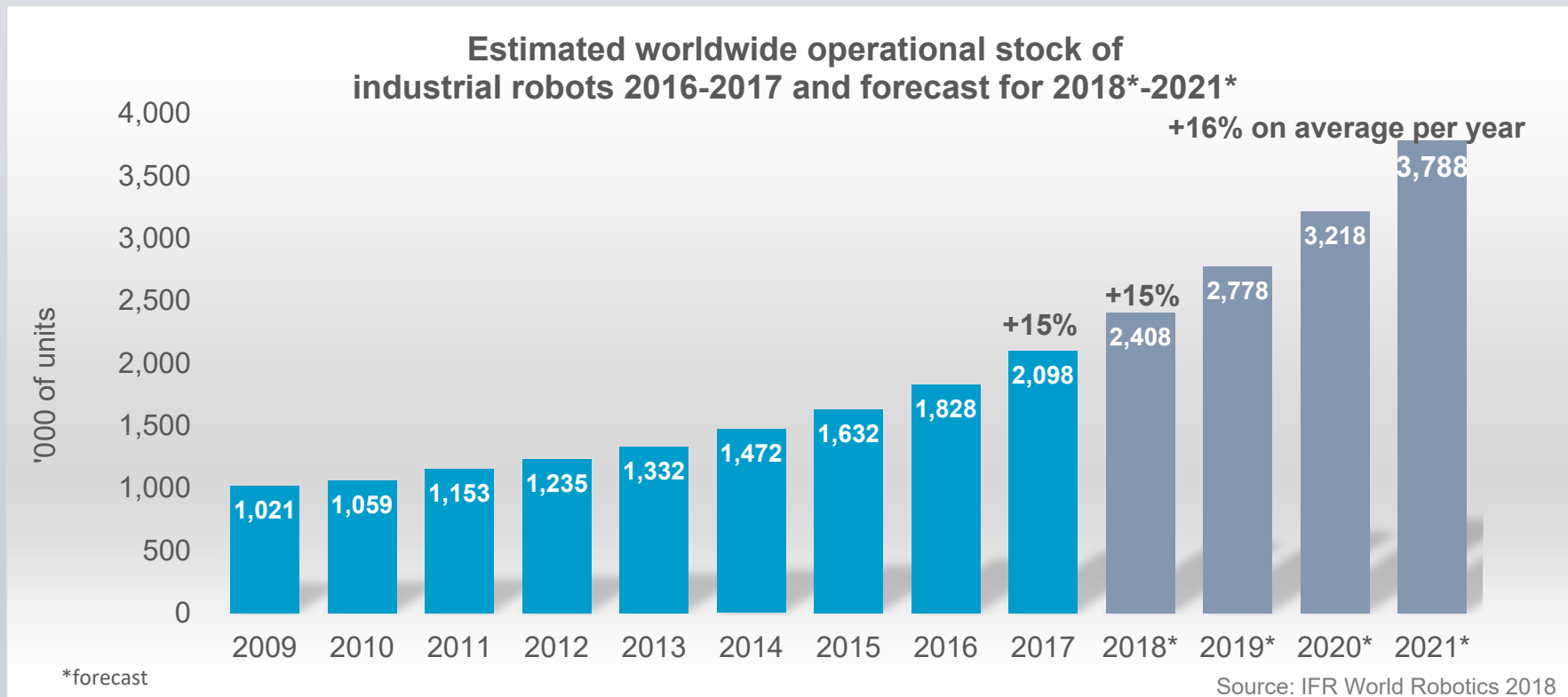
Tomorrow

“Machine learning” enables robots

- to learn by trial-and-error or by video demonstration.
- to self-optimize.
- to communicate with other machines to improve entire processes.

New business models, e.g. Robotics as a Service (RaaS)

2021 : 3.8 Million Industrial Robots in the World's Factories





Professional Service Robots have entered our daily lives



Value of sales

2017: US\$ 6.6 bn, +39%

2018: US\$ 8.7 bn, +33%

2019-2021: US\$ 37 bn, +19% (CAGR)

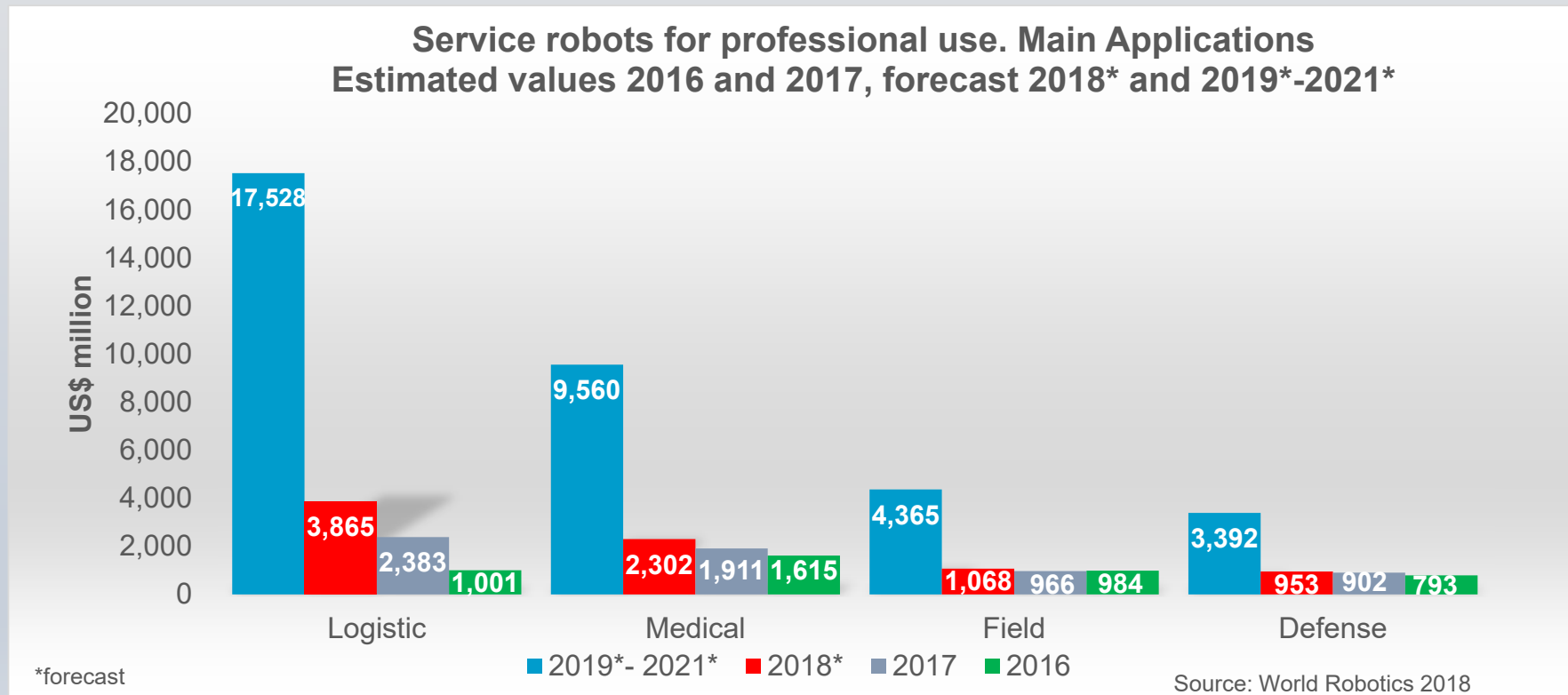
Unit sales:

2017: 109,500 units, +85%

2018: 165,300 units, +32%

2019-2021: 736,600 units, +21% (CAGR)

Professional Service robots: Main drivers of the value growth are logistic systems



AGVs in factories, warehouses, logistic centers, hospitals...

69,000 units installed in 2017, 162% more than in 2016

- 6,700 units in manufacturing
- 62,200 units in warehouses, logistic centers, hospitals ...

2018:

115,000 units, 66% higher than in 2017

2019-2021:

485,000 units, +18% on average per year



Medical robots – most valuable service robots: US\$ 1.9 billion in 2017

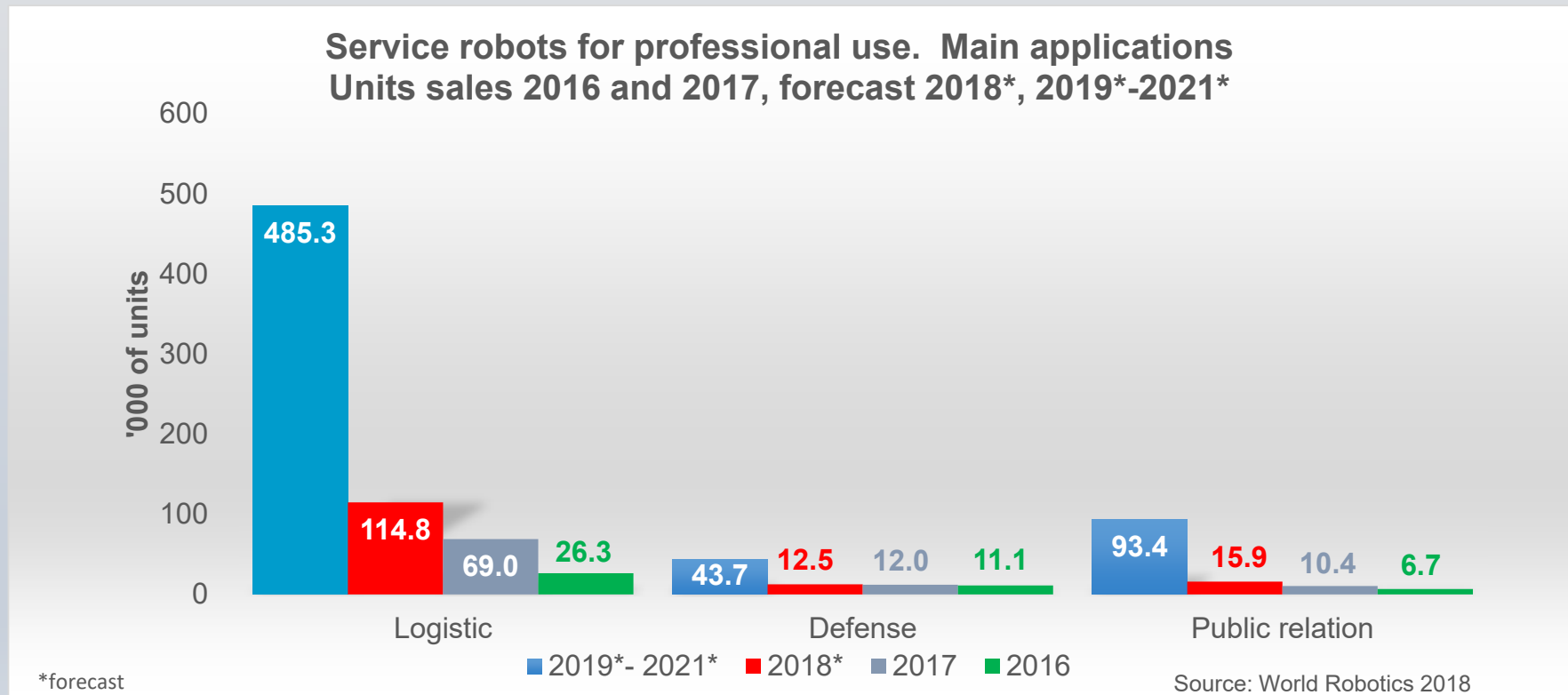
- 2017: 2,900 units, +75%
- 2018: 4,400 units, +49%
- 2019-2021: 22,100 units, +27% (CAGR)

Field robots – mostly milking robots

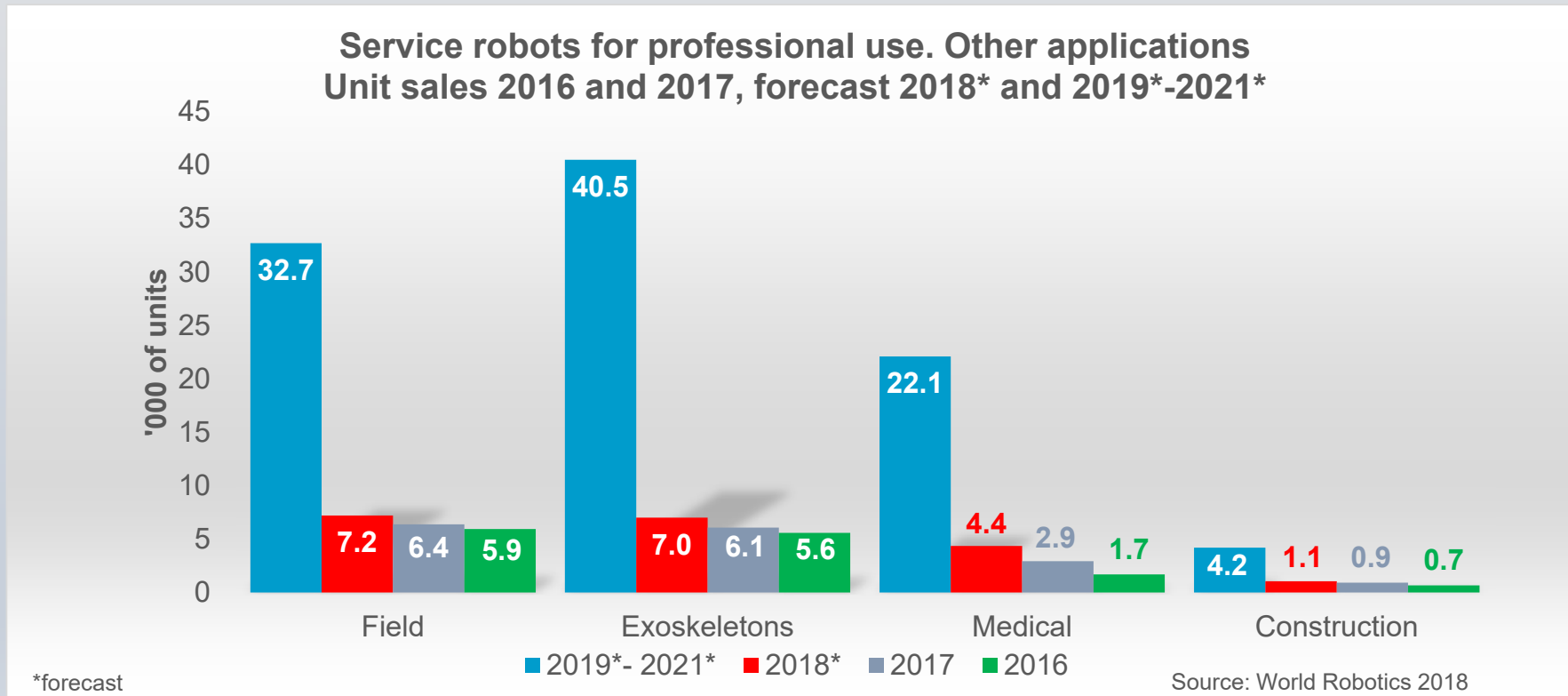
- 5,400 milking robots in 2017, slight increase
- Still low number but high increase: agricultural robots – 520 units in 2017 up from 190 units
- 2018: 7,200 field robots, +17%
- 2019-2021: 32,700, +22% (CAGR)



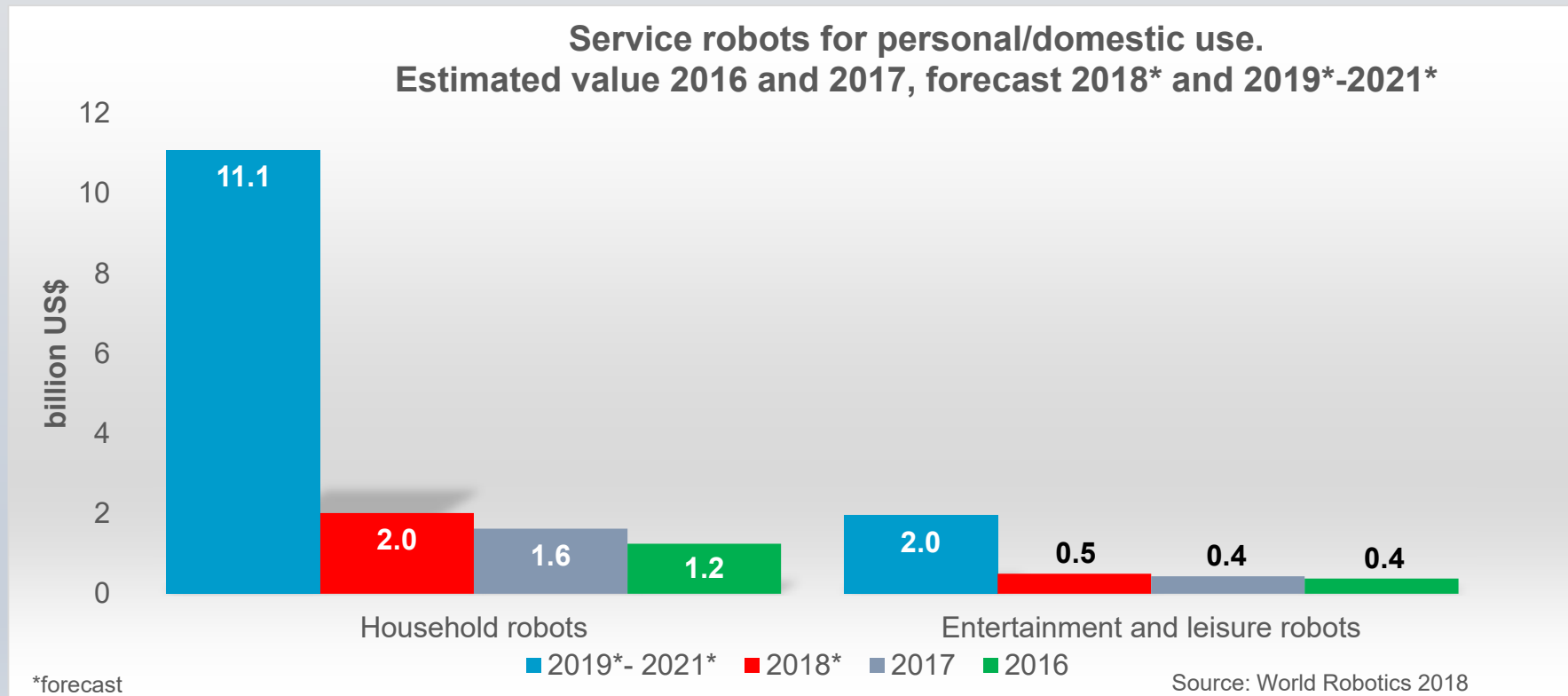
Logistic systems are also the drivers of the growth in units



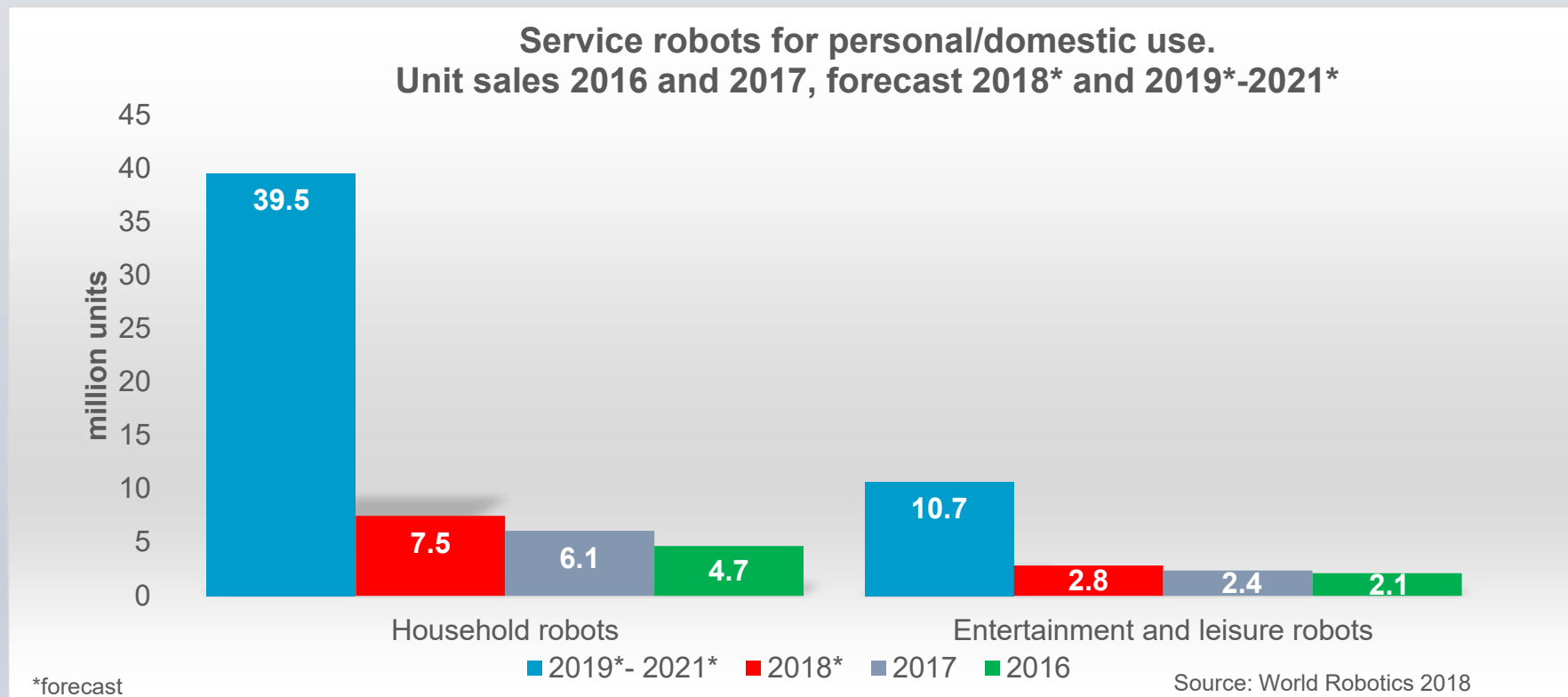
High potential for exoskeletons



Vacuuming and floor cleaning robots are most established personal/domestic service robots / revised graph 5 Dec. 2018

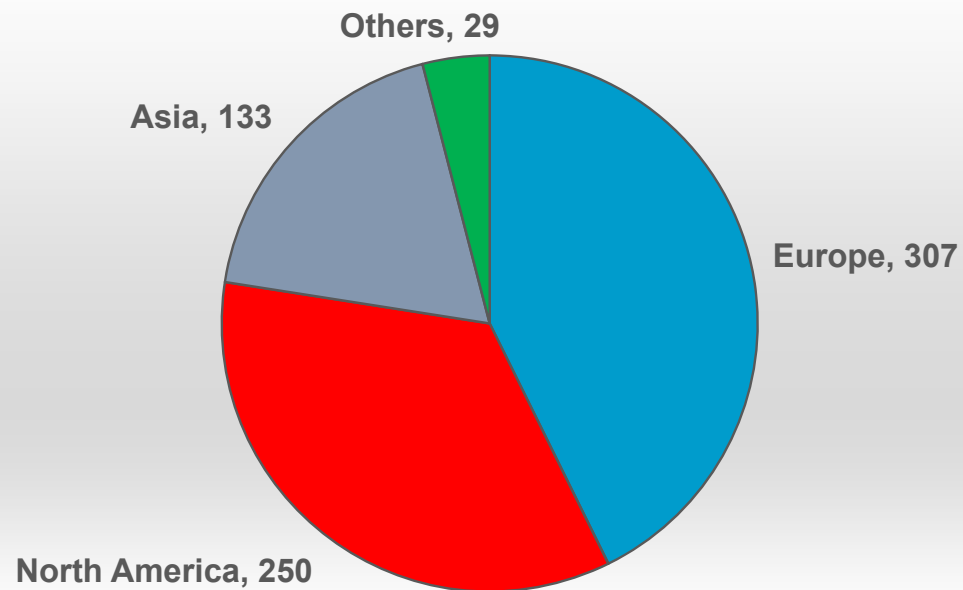


2017: 8.5 million units, +25% - considerable increase expected



More than 700 service robot companies identified

Number of service robot manufacturers of all types
(professional and personal/domestic use) by region of origin



Source: World Robotics 2018

Thank you!

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