

Executive Summary World Robotics 2020 Industrial Robots

Robot installations 2019: Global economic downturn and trade tensions leave their marks

In 2019, global robot installations dropped by 12% to 373,240 units, worth USD 13.8 billion (without software and peripherals). This follows six years of growth and peak values. It reflects the difficult times the two main customer industries, automotive and electrical/electronics, had experienced. It also reflects the trade conflict between two of the main destinations, China and the United States, that has been spreading uncertainty throughout the global economy since 2018. Nevertheless, the automotive industry remains the largest customer industry with 28% of total installations, ahead of electrical/electronics (24%), metal and machinery (12%), plastics and chemical products (5%) and food and beverages (3%). Note that for 20% of the robots there is no information on the customer industry.

The operational stock of robots was computed at 2,722,077 units (+12%). Since 2010, demand for industrial robots has risen considerably due to the ongoing trend towards automation and continued technical innovations in industrial robots. From 2014 to 2019, annual installations increased by 11% on average each year (CAGR). Between 2005 and 2008, the average annual number of robots sold was about 115,000 units, before the global economic and financial crisis caused robot installations to fall to just 60,000 units in 2009 with lots of investments being postponed. In 2010, investments made leeway and drove robot installations up to 120,000 units. By 2015, annual installations had more than doubled to almost 254,000 units. In 2016, the 300,000 installations per year mark was exceeded and in 2017, installations surged to almost 400,000 units. The 400,000 unit mark was crossed in 2018 for the first time.

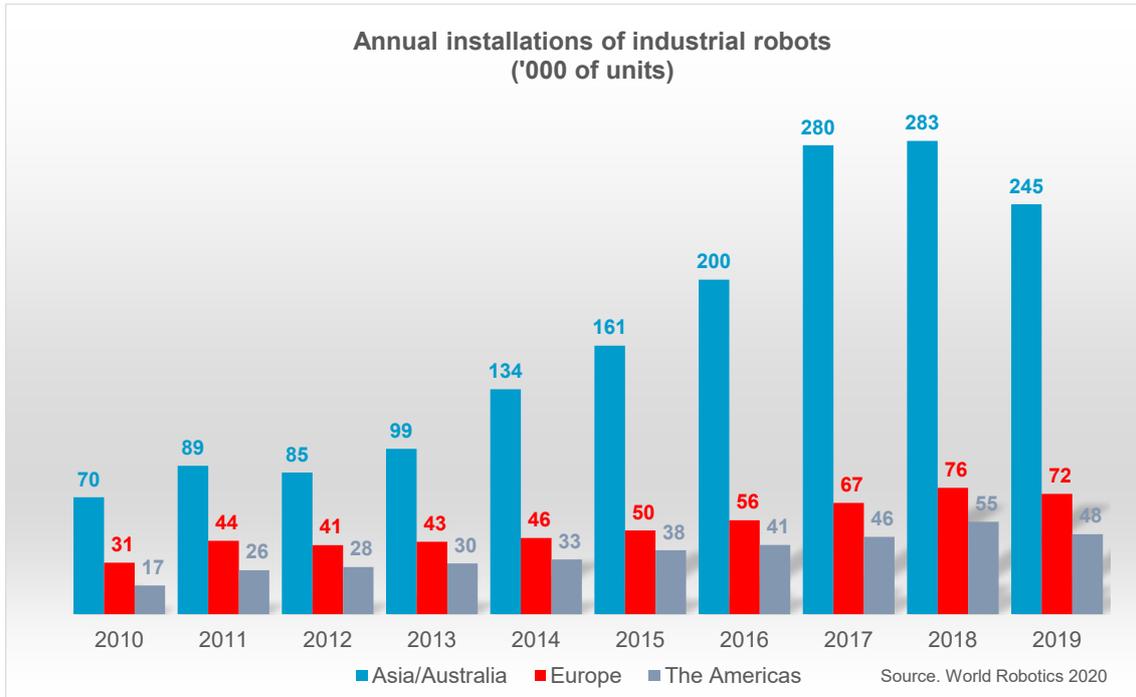
Declining figures in all major markets

Asia¹ is the world's largest industrial robot market. After six years of peak values, installations dropped by 13% in 2019. 245,158 units were installed, down from a peak of 283,080 units in 2018. Two out of three robots (66%) newly deployed in 2019 were installed in Asia. From 2014 to 2019, annual robot installations grew by 13% on average each year. The picture is similar in the three largest Asian markets: Installations in China (140,492 units; -9%), Japan (49,908 units; -10%) and the Republic of Korea (27,873 units; -26%) declined. Robot installations in the second largest market, **Europe**, decreased by 5% to 71,932 units, down from a peak of 75,560 units in 2018. Like in Asia, this marked the end of a six-year period of growth. The annual average growth rate from 2014 to 2019 was +10%. In **the Americas**, installations dropped by 13% to 47,809 units in 2019. This, again, ended a six-year run of new peaks that saw 55,212 robots installed in 2018. The average annual growth rate since 2014 had been +8%.

¹ including Australia and New Zealand

73% of global robot installations in five countries

There are five major markets for industrial robots: **China, Japan, the United States, the Republic of Korea, and Germany**. These countries account for 73% of global robot installations.



China has been the world’s largest industrial robot market since 2013 and accounted for 38% of total installations in 2017 and 2018. In 2019, 140,492 units were installed. This is 9% less than in 2018 but still more than the number of robots installed in Europe and the Americas combined (119,741 units). For more details, see chapter 3.3.1.

In 2019, robot installations in **Japan** dropped by 10% to 49,908 units. The average annual growth rate of 11% since 2014 had been remarkable for a country which already has a high level of automation in industrial production. For more details, see chapter 3.3.4.

After eight years of growth and a peak of 40,373 units in 2018, robot installations in the **United States** dropped by 17% to 33,339 units in 2019. The United States leapfrogged the Republic of Korea into third place in 2018 and maintained this position in 2019. For more details, see chapter 3.2.1.

In the **Republic of Korea**, annual robot installations had been declining since they reached a peak level of 41,373 units in 2016. In 2019, 27,873 units (-26%) were installed. Installation figures for this country strongly depend on the electronics industry, which experienced a tough time in 2018 and 2019. Installations had increased by 2% on average each year since 2014. For more details, see chapter 3.3.5.

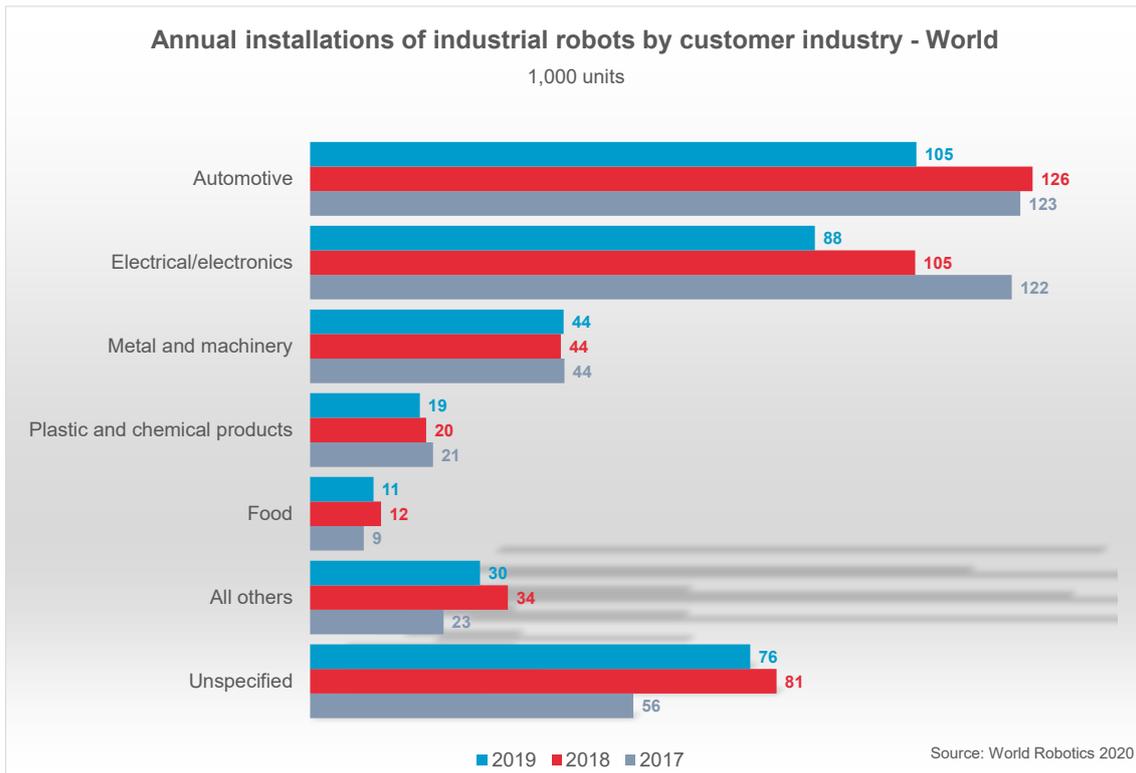
Germany is the fifth largest robot market in the world. In 2019, robot installations dropped by 23% to 20,473 units. Installation figures in this country are mainly driven by the automotive industry, which installed a large number of robots in 2018. The 2019 figure is in line with the sideways movement that has been observed for many years. The CAGR from 2014 to 2019 was 0%. For more details, see chapter 3.4.12.

Declining robot installations in the automotive industry

The **automotive industry** is the most important customer of industrial robots. Almost 28% of all industrial robot installations take place in this industry. After two very strong years and a new peak level of 125,581 units in 2018, demand from the automotive industry was down by 16% to 105,379 units in 2019. Global car and commercial vehicle production declined two years in a row by 5.2% in 2019 and 1.1% in 2018.² While the automotive industry needs to invest in the transition from combustion engines to electric drives, decreasing demand limits the need for capacity expansion. From 2014 to 2019, annual installations in the automotive industry increased by 2% on average each year (CAGR). After the economic crisis in 2008/2009, car manufacturers started to restructure their businesses. Since 2010, investments in new production capacities in emerging markets and investments in production modernization in major car producing countries have driven the demand for robots. The use of new materials, the development of energy efficient drive systems and the high competition in all major car markets pushed the demand for investments despite the existing overcapacities. Automotive part suppliers needed to follow suit. Therefore, the supply of robots to automotive part suppliers gained momentum only in 2011.

Robot installations in the **electrical/electronics industry** (including computers and equipment, radio, TV and communication devices, medical equipment, precision and optical instruments) increased by 24% on average each year from 2013 to 2018. In 2017, they peaked at 121,955 units or 31% of total installations and were about to replace the automotive industry as the most important customer industry. However, since 2018, global demand for electronic devices and components has been substantially decreasing. This customer industry is probably the one most affected by the China-US trade conflict as Asian countries are leaders in manufacturing electronic products and components. In 2019, robot installations in this industry declined by 17% to 87,712 units.

² OICA production statistics 2019



Automation of production further increasing

In 2019, the average³ robot density in the manufacturing industry was 113 robots per 10,000 employees. Driven by the high volume of robot installations in recent years, Asia's average robot density had been growing by 18% CAGR since 2014 to 118 units per 10,000 employees in 2019. European robot density had been growing by just 6% CAGR since 2014 and amounted to 114 units per 10,000 employees in 2019. In the Americas, it was 103 robots per 10,000 employees (+9% CAGR since 2014).

Outlook: 2020 - 2023

The global economic crisis attached to the COVID-19 pandemic will shape industrial robot sales in 2020. A major contraction must be expected in the short run. In the medium term, this crisis will be a digitalization booster that will create growth opportunities for the robotics industry worldwide. The long-run perspectives remain excellent.

³ Average values for geographic aggregates (e.g. World, Europe, Asia/Australia) include only those countries listed in table 2.6, 2.7 or 2.8 respectively.