

## European builders frontrunners in robotics

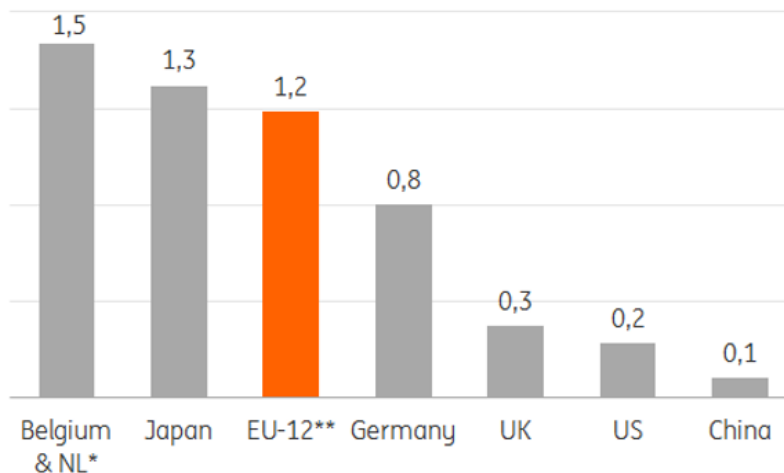
The global construction sector is not known for innovation. But in Europe, that's changing



For all the talk of a robot revolution, change has been slow to come to the global construction sector. With high investment costs and variable work locations, innovation has proven challenging and automation has lagged behind other industries, such as manufacturing. But as new technologies threaten to disrupt the industry and push traditional businesses out of the supply chain, many firms are taking action- and Europe has been leading the way.

### EU-12 has relatively high number of robots in construction

Number of robots per 10,000 workers, 2017



Source: World Robotics, National Bureau of Statistics of China, Oxford Economics. \*Data for Netherlands, Belgium only available for two together. \*\*Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain

## The EU-12 is doing well relative to other regions

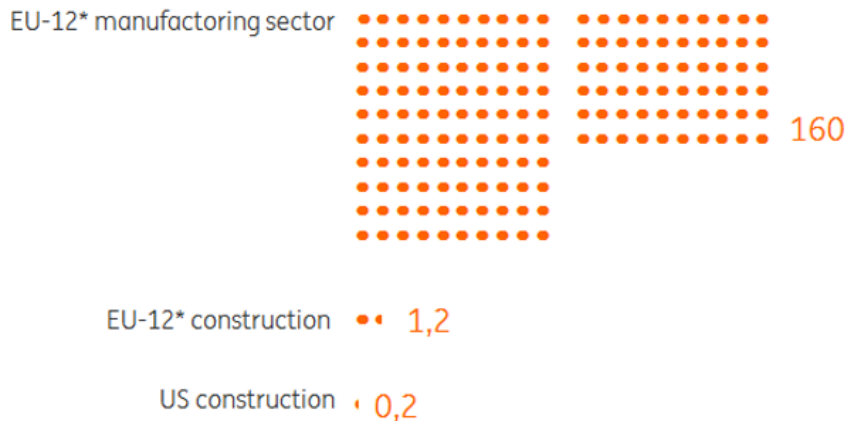
European construction companies may still have a long way to go. But relative to their peers in the US and China, they're significantly more advanced in the area of robotics. Builders in the EU-12 have, on average, 1.2 robots per 10,000 workers compared to 0.2 in the US and 0.1 in China.

Within Europe, however, there are sizeable differences:

- The German sector has 0.8 robots per 10,000 workers
- The UK has 0.3 robots per 10,000 workers
- The Netherlands and Belgium have 1.5 robots per 10,000 workers

The high score in the Netherlands and Belgium is perhaps not too surprising given the relatively high wage costs there, which make robotics more financially attractive. For the Netherlands specifically, the relatively high percentage of series-based construction (such as terraced houses) ensures that work can also be robotised relatively more easily. In addition, building production has grown faster there in recent years than in most other countries, suggesting more room for new investment (in new robots, for instance).

**Robots in the EU-12 construction sector: fewer than in manufacturing, more than in the US**  
 Number of robots per 10,000 employees (2017)



Source: World Robotics, National Bureau of Statistics of China & Oxford Economics, processed by the ING Economics Department. \*Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain.

**Construction lags behind in industrialisation**

In Europe, each employee in the construction sector has access to almost €10,000 worth of machinery. While that might sound like a lot, it's less than a fifth of the amount available to those working in manufacturing.

Construction companies require a very high degree of flexibility, which industrialisation does not offer. Builders have to build something different each time at a different location, and expensive machinery is not easy to move from place to place. Construction companies are also dealing with a volatile market, with periods of peak activity alternating with periods of no activity – conditions that demand quick scaling up and down. This is not a good combination for a business with high capital intensity.

**European construction worker has little machinery**  
 Value of machinery per worker



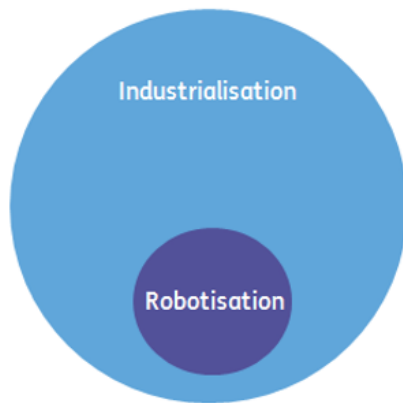
Source: Eurostat & ING Economics Department

**Robots suitable for parts of the construction process**

To some extent, new robotics technology, along with prefabs, provide a solution for further industrialisation. After all, robots do offer more flexibility than 'traditional' machinery that can often only do one thing. There are various activities in the construction sector (such as bricklaying) that lend themselves to robotisation. Unlike a machine, a robot can also perform various programmable tasks, which is very important in construction, where every project can be different.

The rise of prefabs provides a boost because it's easier to have robots operating in a factory than outside at the construction site, where weather conditions can be changeable.

### Robotisation is a part of industrialisation



**Industrialisation:** One aspect of industrialisation is the mechanisation of production processes, as part of which manual actions are performed by machines.

**Robotisation** involves having actions performed by advanced machines (robots) that:

- are reprogrammable;
- are operated automatically;
- have three or more axes;
- can be either fixed at one spot or mobile; and
- offer flexibility because they can be used for multiple purposes.

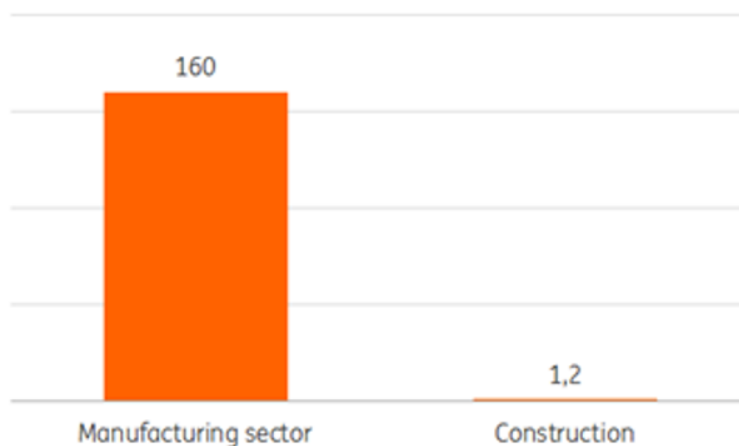
Source: ING Economics Department

## Construction lags manufacturing

Compared with the European manufacturing sector, there is still a significant difference in terms of the use of robots. As mentioned above, there are 1.2 robots per 10,000 workers in the construction sector, compared with approximately 160 (per 10,000 workers) in the European manufacturing sector. Robots may be able to perform various activities in construction but the high investment costs are often a problem for companies because they don't know whether they will be able to recoup the investment if the economy turns down. In addition, not all construction activities can be carried out in a factory, which means that the transportation of robots from one construction site to another, along with possible adverse weather conditions, remains an issue.

### Very few robots in construction compared with manufacturing sector

Number of robots per 10,000 workers in EU-12\*, 2017



Source: World Robotics, Eurostat & Oxford Economics & ING Economics Department. \*Austria, Belgium, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain

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