Electromobility and automation

Powered up

Electromobility is on a growth course worldwide. It's not just the streetscape that’s changing, the automotive industry markets are also undergoing a fundamental change. Corporations globally are investing heavily in battery production. Modern automation solutions play a leading role in this change.
The year is 2050. Two out of every three people live in megacities. Mobility is something that people take for granted, just as they do the clean air that they breathe. Electric cars travel along the streets, without any noise or emissions. People get in and out but nobody sits behind the steering wheel – because it no longer exists. Self-driving vehicles are the norm. The age of e-mobility is a time in which people no longer think about mileage, repairs, insurance and warranty claims. Nor do they think about fine particulates. Because there simply aren’t any anymore. A change has taken place in the way people think and act, so that car owners are now mobility users. It is a scenario that futurologists are currently predicting, with some even saying that it may happen before 2050. It is not yet possible to say whether these predictions will come true. The one thing that is certain is that there hasn’t been this much activity in the field of e-mobility in over a century.

Electric cars have been around for 130 years
The first electric cars appeared on the streets of Europe and North America towards the end of the 19th century. The Flocken Elektrowagen, developed by Maschinenfabrik A. Flocken in 1888, was one of the world’s first four-wheeled electrically powered passenger vehicles. French race car driver Gaston de Chasselloup-Laubat set the first recognised automobile land speed records, and in 1898 he broke through the 100 km/h barrier. At the turn of the century, there were around 34,000 electric vehicles registered in the USA. The success of cheap crude oil as an energy source caused the development of e-mobility to grind to a halt until the oil crisis of the 1990s once again raised awareness of alternative drive forms. Electromobility is now gathering speed all over the world, not least thanks to visionaries and pioneers like Tesla founder Elon Musk. In 2015 alone, 550,000 electric vehicles were registered worldwide, along with millions of hybrid vehicles. Experts from international economic development agencies predict that electric vehicles will account for around one third of all new vehicle registrations in Europe by 2025. For China, the figure is even higher at up to 50 per cent and it is already pushing through government measures for e-mobility. From 2019, electric cars will have to make up at least 10 per cent of each manufacturer’s output, and this will rise to 12 per cent from 2020.
“Premium car manufacturers are the main driving force behind electromobility in Germany and Europe. While they may be arriving late on the scene, they are focusing all their experience on mass production. Festo in Germany identified the electrification of the power train as a global trend back in 2009. All products were tested with our customers on site in a dry room, cleanroom and copper-free environment. The German specialist team for e-mobility is helping our customers to improve their competitiveness in new growth markets.”

Michael Karcher, Festo Germany
Fundamental change worldwide
The automotive industry is facing one of the greatest challenges in its history. This will affect suppliers in particular. A combustion engine has between 1,500 and 2,000 parts, while an electric motor has just 150 to 200. Electric motors may have fewer parts, but the growth worldwide in their development and production, as well as that of batteries, is comparatively large, especially as the world’s leading companies are investing in this area. Around the world, new factories are being built and vehicle manufacturers as well as battery producers are looking for automation. Samsung is currently building a plant in Hungary, while LG is constructing one in Poland. The production of lithium-ion batteries is presenting automation technology with special challenges, from the production of electrodes and cells to the assembly of battery modules. The battery accounts for between roughly 30 and 40 per cent of the added value in electric vehicles. In addition to the big automotive brand names, new electric vehicle manufacturers are also emerging, above all in the USA (for example Tesla and Faraday Future) and in China (Next-EV). Roughly 13,000 electric taxis, supplied by Chinese manufacturer BYD over the past two years, are on the road in China’s big cities.

Customised solutions
Festo began supplying the global growth market that is electromobility with customised solutions in 2012. Today, Festo advises and supplies major global customers such as the Korean corporation LG Chem. The key components in Festo’s success are its broad product range including copper-free products, its services and engineering tools as well as worldwide teams with specialist know-how and solution competence, providing customers with expert advice in project planning and conceptualisation. The Festo team in South Korea has managed to get itself on board the enormous LG project in Poland. Kim Sung Chul, Manager LG Production Engineering Research Institute and Battery Assembly Equipment Technology Task, Korea: “Festo is supplying the handling systems for the new plant in Poland. LG highly values the competent advice, the product range, the engineering concepts and the global network of automation specialists offered by Festo.”

1.2018 trends in automation
“With Tesla and Lucid Motors, we are supplying the two most promising electromobility start-ups in Silicon Valley. We support our customers and integrators from conceptualisation through to commissioning, as well as with service and support. I am proud of our collaboration with the engineers at Tesla and of our contribution to the development of the Tesla Model 3.”

Anish Ramrakhyani, Festo USA

“China is the fastest growing market for batteries. We have put together a special Key Account Management team to optimally support our customers with expertise and solutions.”

Marvin Liu, Festo China
“LG is pursuing a large-scale growth strategy. Development and growth worldwide are highly dynamic. We are proud to have been chosen by LG as its central partner for electric axes and valves and of our involvement in the biggest battery production plant outside Korea.”

Munseok Jang, Festo South Korea

---

At the heart of the market
To be able to supply this enormous potential market with automation solutions, Festo has teams based in the core countries who advise customers and provide them with technical support. 80 per cent of all Festo electromobility customers are based in the USA, Greater China and South Korea, as well as in Japan and Central Europe, especially in Germany and Italy. For Johannes Strasser, Global Key Account Management and Industry Segment Management Electronics at Festo, having close contact with the customers is vital: “With expert teams in the main markets of Korea, China, USA and in Europe, we are a truly global partner that offers direct contact and customer support on site. For example, at Festo we have worked with LG Chem for over two years.”

Handling systems save time and money
The benefit of Festo is that it offers everything from a single source – standard handling systems, special solutions and copper-free products that do not damage or contaminate the sensitive lithium-ion cells. Thanks to the engineering tools from Festo, solutions can be created virtually, thus saving time and costs in project planning and design. This phase is one of the greatest cost pools, representing around 25 to 30 per cent of the overall service life costs in machine and plant construction. Energy-efficient products and services help companies to reduce power consumption in production, while Industry 4.0 expertise helps to build a future-ready production system.

www.festo.com/electromobility