

Germany joins the electromobility race

Konrad Popławski

On 13 November, Elon Musk, the CEO of Tesla, announced that his firm would open a battery, battery cell, motor and electric car factory near Berlin by the end of 2021. It will employ 6,000-7,000 people. A design and engineering office employing around 3,000 people will be created in Berlin. Earlier, the Netherlands, the United Kingdom and western German federal states were viewed as the front-runners in the race for the location of Tesla's first European factory. Brandenburg's subsidy for construction of the plant calculated on the basis of an analysis of other investments on a similar scale may exceed 1 billion euros.

There is no battery cell factory in Germany, although China's CATL promised in 2018 to build a lithium-ion cell production plant in Erfurt (14 GWh) – it is planned for launch in 2022. Volkswagen is considering a similar step, planning to build a factory with a potential of 16 GWh in Salzgitter, Germany by 2023 in co-operation with Northvolt. The German-French consortium of PSA, Opel and Saft is planning to build one factory in France and one in Germany (no details are currently known). For comparison, similar plants are already operating in Central European countries. An LG Chem factory is located near Wrocław, Poland. After redevelopment, which is planned to be finished next year, it will be the world's largest cell production plant, with a production potential reaching 70 GWh, and the company is already planning to build another plant in Poland. In turn, Samsung's SDI factory (3 GWh) operates in Hungary, and the next plant of SK Innovation (7.5 GWh) will be opened soon.

Commentary

- The facts are increasingly suggesting that electric cars will set the trend for the development of the automotive industry for at least the next few decades. This poses a serious threat to the global position of the German automotive industry. The development of electromobility will result in a reduction of the German economy's technological advantage in manufacturing engines, fuel systems, gearboxes and exhaust systems—the areas German manufacturers have deep expertise in. Electric cars are made of a much smaller number of parts –around 200 components are needed for manufacturing one, while a car with a combustion engine is made of around 1,400 parts. Designing lithium-ion cells (the basic components of batteries) which are as efficient as possible is the key competence in the case of electric car production. The industry making these elements has so far been totally dominated by Asian manufacturers. According to data from the Centre for Solar Energy and Hydrogen Research, in 2018, China's CATL was the largest cell manufacturer (holding a 23% share of the global

market), followed by Japan's Panasonic (21.9%), China's BYD (12.8%) and the Korean companies LG Chem (10.2%) and Samsung SDI (5.5%).

- In 2017, the European Commission assessed that the EU was five years behind as regards battery production technology; at present this gap has been reduced to three years. According to industry specialists, Germany alone is 10 years behind in this area in technological terms. Forecasts presented by the Fraunhofer Institute indicate that Germany has only six years to gain battery production capabilities because starting from 2025 electric cars will begin to be used on a massive scale. According to the German Institute for Employment Research, the number of jobs linked to combustion engine production may be cut by 114,000 by 2035. In turn, according to the estimates presented by the Fraunhofer Institute, the number of jobs in the combustion engine production industry will be reduced from 210,000 to 100,000 by 2030. It is estimated that at the same time around 25,000 jobs will be created in the electromobility industry. Numerous major German subcontractors co-operating with companies from the automotive industry already begin to have problems linked to the falling demand for some elements of fuel-propelled vehicles.
- The German automotive industry has been rather passive in developing battery technologies due to its previous failures in this area. Attempts to co-operate with Asian partners and to establish consortiums have proven equally unsuccessful. The joint venture of Samsung and Bosch – SB LiMotive – which was established in 2008, was wound up in 2012. The same happened in 2015 to Li-Tec (a joint venture of the German firms Daimler and Evonik) and Lithium Energy and Power (a joint venture founded by Bosch and Japan's GS Yuasa). Daimler had a battery cell factory in Kamenz (Saxony), but it was closed in 2015 due to low demand. TerraE, a consortium consisting of 19 firms and institutions, which was to begin manufacturing batteries in Germany (6 GWh annually) was established in May 2017. However, its functioning became problematic already in the second half of 2018 because none of the shareholders was ready to invest significant amounts of money. Finally, the firm was taken over in November 2018 by the German firm BMZ, but it is uncertain what will happen to the factory. In turn, in March 2018, Bosch was the last of the large German corporations to decide that it will not build a battery factory on its own.
- Since the German automotive companies had shown hardly any interest in developing electromobility, the research institutes in Germany reduced their competences in the areas of electrochemistry and electrophysics. The funds of German companies that might have been invested in electromobility in Germany are thus being transferred under long-term contracts concerning battery cell supplies to the market leaders based in Asia. BMW signed a contract worth 1.5 billion euros envisaging the purchase of cells from the factory of the Chinese company CATL (which is being built in Erfurt), a contract worth 2.5 billion euros covering cells from China, and a contract with Samsung SDI. Volkswagen signed contracts envisaging cell supplies worth 20 billion euros with CATL, LG Chem and Samsung SDI. It will need cells worth a total of 50 billion euros by 2025. Daimler has also signed cell supply contracts worth 20 billion euros.
- Tesla's promise to build a battery factory in Germany is an important signal that this country is still treated as an attractive place for locating production plants using cutting-

edge automotive technologies. A new impulse for developing battery technologies came as the German government became more engaged in supporting electromobility in Germany. The government intends to offer subsidies worth a total of 3.5 billion euros (to be used by 2025) to increase the number of charging points to 70,000, i.e. by 250%, by 2021. Furthermore, the amount of the subsidy on electric car purchases is expected to be increased from the previous level of 4,000 euros to 6,000 euros (for cars which cost no more than 40,000 euros). This is expected to cover up to 700,000 vehicles. In November 2018, the minister for the economy, Peter Altmaier, announced that 1 billion euros would be offered in subsidies on building battery factories in Germany by 2021. In effect, Volkswagen decided to become engaged in building a plant of this type in Germany. The German government expects that European manufacturers should be able to satisfy one third of the battery demand between 2025 and 2030, which means creating a production potential of 600–1500 GWh by 2030. However, according to Benchmark Mineral Intelligence, by 2028, there will be 46 factories with a total production potential of 1000 GWh in China alone, while Europe will have only nine, with a potential of 248 GWh.