



Poland

Europe's EV Battery Manufacturing Hub

The background of the lower half of the page is a vibrant blue abstract design. It features numerous thin, white, curved lines that create a sense of motion and depth, resembling light trails or data paths. Interspersed among these lines are many small, out-of-focus white circles, creating a bokeh effect. The overall composition is dynamic and futuristic.

expert.

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Contents

1	Strengthening Poland's value chain	5
2	Poland Battery Hub: Gateway to Europe	6
2.1	Skilled workforce	7
2.2	EV specialist suppliers	7
2.3	Cost competitive	7
2.4	Integrated supply chain	8
3	Renewable Energy	9
3.1	National Plan	9
3.2	Offshore and solar	9
4	Conclusion	10
	Transition powered by PM Group	10

Poland has by far the most developed Li-ion battery ecosystem in Europe, providing European market access to major players along the entire value chain, from raw materials, cathode materials, components, cell manufacturing, battery packs to recycling.

Poland's strong national framework in terms of economic, legislative, administrative and environmental policies, offers the right level of stability and investment assurance.

1 Strengthening Poland's value chain

Over 80% of li-ion battery manufacturing is centered in Asia, while the majority of lithium and other vital raw materials are sourced outside Europe. To combat this and to decrease reliance on imported batteries, the European Battery Alliance (EBA) was established in 2017. The goal of the EBA was to create a complete domestic battery value chain for clean energy transition and a more competitive industry.

In 2020, the European Commission published a series of battery import requirements (see *Table 1*). From 2024, OEM's will need to source the majority of batteries and materials from within the EU. The requirements also make it clear that to sell into the EU, suppliers will need to establish a European operations base.

Date	Level of localisation
Until December 2023	No change
2024 to 2027	Components such as cathodes, anodes etc. must be sourced in the EU
2027	100% European Sourcing

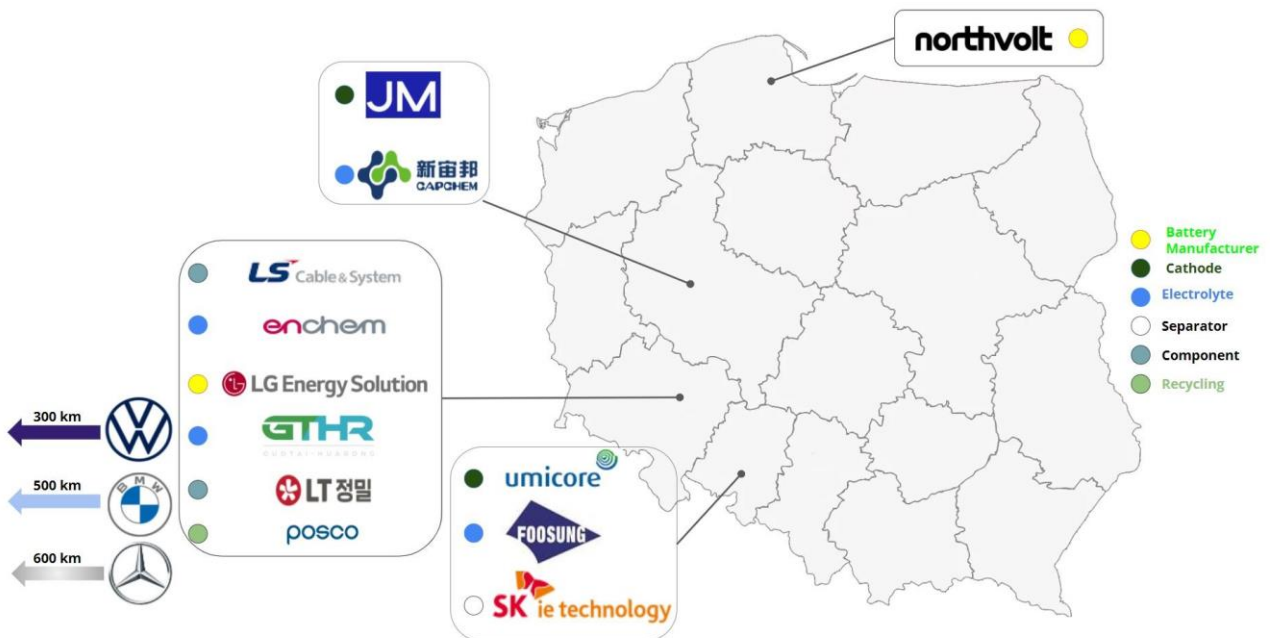
Table 1. EU Rules of Origin for European Lithium Battery Production

2 Poland Battery Hub: Gateway to Europe

Poland has been an attractive market for foreign investors who appreciate the country's well-educated workforce, geographic location and economic stability.

Logistics and supply costs play a key role in OEM supplier selection; Poland's unique central European location has unrivalled access to major European transportation hubs and Baltic Sea ports. Its strengths are in the mid and upstream links of the battery value chain i.e. cathode, electrolyte, cell manufacturing.

With over 60 Li-ion battery related manufacturing plants, Poland is third in Europe after Germany with 76 and Italy with 67. Following a series of major foreign direct investments Poland has become a European leader in the production of li-ion batteries, accounting for 40% of the total production in Europe in 2019.



Poland's EV/li-ion battery investment landscape

2.1 Skilled workforce

Thanks to the LG Energy Solutions (LGES) investment, Poland has accumulated significant critical knowledge and trained highly skilled engineers in both battery and component manufacturing; a major incentive as skilled labour is in short supply globally.

2.2 EV specialist suppliers



LGES's successful investment has encouraged other suppliers to choose Poland, further solidifying the formation of a battery manufacturing Hub. LG's battery materials suppliers, SK IE Technology (separator), Enchem and Foonsung (electrolyte) are also actively investing in Poland.

At the opening of the first factory, Rho Jae-sok, CEO and President of SK IE Technology, described Poland as its "European production base". The company has received so many orders that the entire initial output of its four plants has been purchased.

2.3 Cost competitive

Bloomberg's *BNEF 2020 Battery Manufacturing Cost Study*, identified Poland as Europe's most competitive manufacturing location. Cost competitive labour costs, along with higher economies of scale, make Poland highly competitive with Asian suppliers.

Poland, ranked 14th overall and 5th behind the US in terms of manufacturing, is the highest ranked European country in the *BNEF 2021 Global Lithium-ion Battery Supply Chain* report. The rankings are based on access to raw materials, materials refining and component production and the carbon intensity of their power grids.

'Poland is the highest ranked European country in the BNEF 2021 Global Lithium-ion Battery Supply Chain Report.'

2.4 Integrated supply chain

Poland is home to world-leading upstream and downstream suppliers including smelters, precursors, cathodes, battery components, cells, battery packs and recycling facilities. The convergence of suppliers allows the entire supply chain to be integrated into one jurisdiction. Supply chain logistics, costs and CO₂ emissions are key factors for European OEM's when assessing suppliers.

The country exports enough batteries to power more than 500,000 electric vehicles. LGES plans to double production to 65GWh by 2022, presenting a considerable opportunity for battery material and component suppliers.



Investment incentives and the availability of highly skilled engineers, has helped to transform Poland into one of the world's largest battery production centres.

3 Renewable Energy

Low-carbon power supplies are particularly attractive to the ESG conscious li-ion battery makers; automakers have increasingly high standards for the acceptable carbon footprint of battery cells. LGES's Polish factory has been running on 100% renewable energy since 2019, a global first for EV battery production.

3.1 National Plan

Poland's *National Plan for Energy and Climate 2021-2030*, sets out the share of energy from renewable sources in the national mix. Renewables will increase from 17.6% in 2025 to 21 percent in 2030. Poland plans to increase its renewable power capacity through the development of offshore wind farms.



3.2 Offshore and solar

'Polish power companies are able to provide battery manufacturers and suppliers with access to 100% renewable energy.'

By 2027, Poland expects 6GW power capacity to be generated by offshore wind. The Polish solar market is growing by 35% annually. By 2024, the total PV capacity is expected to reach 8.3 GW.

Polish power companies are able to provide battery manufacturers and suppliers with access to 100% renewable energy.

In addition to LGES, SK IE Technology (SKIET) are running their plants on 100% green electricity and in turn reducing 70% of greenhouse gases emitted from the production process of separators.

4 Conclusion

Poland will play an important role in the battery value chain. It has the potential to be a leader in the creation of the EU battery industry.

As demand continues over the next decade, Poland offers investors numerous advantages in terms of complete, end-to-end material supply chain and sustainable battery production technologies.

Building upon these strengths battery companies continue to invest in Poland. Over the last year both Northvolt (\$200 million) and SK IE (\$1 billion) have announced significant investments.

Transition powered by PM Group

As an international project delivery company, PM Group is working with leading battery manufacturing companies to help build out the transition to zero carbon energy. We are able to apply our long track record and experience in the high technology sector to design, construct and deliver complex production facilities across the full range of the battery supply chain including cathode materials, electrolyte, separator and cell manufacturing. Key industrial areas see **figure 2**.

For further information and references:

<https://www.pmgroun-global.com/what-we-do/sectors/advanced-manufacturing/ev-battery>



Figure 2. Active PM Group battery projects

Appendix

Endnotes

1. The Polish Automobile and Motorcycle Federation (PZM)

<https://www.pzm.pl/>

2. European Battery Alliance (EBA)

https://ec.europa.eu/growth/industry/strategy/industrial-alliances/european-battery-alliance_pl

3. Poland's battery sector pulls in investment

<https://www.thefirstnews.com/article/polands-battery-sector-pulls-in-investment-19975>

4. Bloomberg's *BNEF 2020 Battery Manufacturing Cost Study*

<https://about.bnef.com/electric-vehicle-outlook/>

National Energy and Climate Plan for the years 2021-2030

<https://www.gov.pl/web/klimat/national-energy-and-climate-plan-for-the-years-2021-2030>