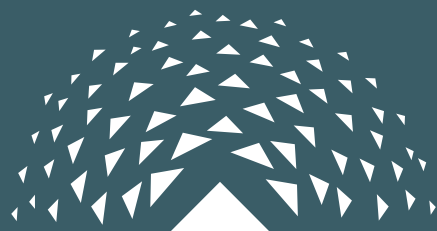


**To Decouple or not to Decouple?  
How to Address China's Dominance  
in the European EV Battery Supply Chain**

Leválni vagy nem leválni?

Hogyan kezelhető Kína befolyása az európai  
elektromos járműipar akkumulátor ellátási láncában

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# KKI Policy Brief

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The present analysis and its conclusions reflect the author's opinion and cannot be considered the official position of the Institute for Foreign Affairs and Trade, the Ministry of Foreign Affairs and Trade, or the Government of Hungary.

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**Summary:** Geopolitical tensions between Western countries and China are prompting the European Union to attempt to reduce China's economic exposure. This poses a particularly serious challenge to the Hungarian government, whose economic policy cornerstone is to create a manufacturing base for the interconnected European and Asian electric car value chains. This paper seeks to answer the question how the European Union can realistically attempt to reduce the European electric car industry's dependence on China by exploring mergers in the European electric car industry and the Chinese battery industry. The study concludes by discussing whether the Hungarian government should maintain its current economic policy in the future or whether it needs to reconsider it due to the high risks involved.

**Keywords:** European Union, China, Hungary, battery manufacturing, electric vehicle, geopolitics, decoupling

**Összefoglalás:** A nyugati országok és Kína közötti geopolitikai feszültségek arra készítetik az Európai Unió-t, hogy megkísérelje a kínai gazdasági kitettségek csökkentését. Mindez különösen súlyos kihívás elé állítja a magyar kormányt, amely gazdaságpolitikájának sarokköve, hogy termelőbázist nyújtson az összefonódó európai és ázsiai elektromos autóiipari értékláncok számára. Jelen tanulmány az európai elektromos autóiipar és a kínai akkumulátorgyártók közötti összefonódások áttekintésén keresztül arra a kérdésre keresi a választ, hogy milyen reális célkitűzése lehet az Európai Uniónak annak tekintetében, hogy csökkentse az európai elektromos autóiipar kínai kitettségét. Konklúziójában a tanulmány kitér arra, hogy érdemes-e a jövőben a magyar kormánynak fenntartania a jelenlegi gazdaságpolitikáját, vagy a túlzott kockázatok miatt szükségszerűen át kell-e gondolnia azt.

**Kulcsszavak:** Európai Unió, Kína, Magyarország, akkumulátorgyártás, elektromos gépjárművek, geopolitika, leválás

## INTRODUCTION

The significance of the car industry in Hungary is difficult to overestimate. The output of the vehicle manufacturing industry accounted for almost 17% of Hungary's GDP in 2021. The sector comprises more than 700 companies employing almost 160,000 people altogether. The country is deeply integrated into international automotive value chains, as it hosts 9 OEMs (original equipment manufacturer) and 66 Tier 1 suppliers. Roughly 420,000 new cars and 1.9 million

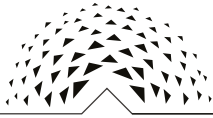
engines are produced annually in Hungary. The country's car industry is especially interconnected with the German automotive sector, as Hungary is the only country to host the production units of all three premium German car manufacturers (Audi, BMW, and Daimler) in Europe outside their homeland.

As the global car industry turns increasingly towards electromobility, the German and the Hungarian automotive sectors have to keep up with the transition in order to secure their positions in the emerging value chains of electric vehicle manufacturing. Therefore, in recent years the Hungarian government has made huge efforts to promote the country as an ideal location for e-mobility related FDI projects, while German and other OEMs throughout Europe have also been working actively to establish their supply network for the new era. As a result, several Asian, especially Chinese, electric vehicle battery manufacturers have opted to locate manufacturing units close to their key European customers. Chinese [CATL](#) (Contemporary Amperex Technology Co.), [SVOLT](#), and [Gotion High-Tech](#) are all on their way to ramp up production in their new manufacturing sites in Germany, while Hungary has captured record-breaking FDI projects from Korean and Chinese battery producers, namely SK Innovation and CATL. Furthermore, eighteen battery producers and their suppliers (mostly Asian investors) have manufacturing sites in Hungary currently. Chinese CATL intends to supply its German customers from its future gigafactory in Eastern Hungary. As of November 2022, at least [eight Chinese battery cell projects were in a construction phase](#) in Europe, with an estimated total annual production capacity of 214 GWh by 2025. This is over three times Europe's total 2021 battery capacity of 60 GWh.

All these trends are taking place at a time when dependence on Chinese technology is increasingly seen as a security risk in the West and the EU is trying to reduce its dependence on China. With electromobility clearly set to be one of the dominant trends in the automotive industry over the next decade, it is important to examine how geopolitical competition will affect EU-China cooperation in this sector. This policy brief examines the characteristics of Chinese battery manufacturers' integration into European electric vehicle supply chains to understand what scenarios are possible for the EU to achieve a less dependent situation.

## POTENTIAL EU STRATEGIES

In the age of globalization, all stakeholders need to understand that connectivity is an opportunity for economic development, although it is also an exposure at the same time. Connectivity can therefore be seen as a tool to change the behaviour of other actors. When states use connectivity as a [strategy](#), they seek to achieve two goals: to create an asymmetrically greater weight in interdependence while also diversifying their own dependencies. While the first goal provides an opportunity to effectively influence others, the second goal reduces the chance of being influenced



unilaterally. Although connectivity is generally not a weapon, it can be weaponised in conflict situations. If the EU wants to minimize the influence of Chinese battery suppliers in the production of electric vehicles, it has two strategies to choose from. It can try to create counter critical dependencies or reduce its asymmetric relationship in areas where it is unilaterally dependent on China, by diversifying its partners or taking steps to decouple. The costs of these strategic steps must be considered by policymakers. Reducing dependence requires investment (e.g. rare earths, battery production, components, increased R&D spending), while steps to reduce dependence on China can have profound economic and political consequences (disruption of the entire value chain, escalation of a trade war, loss of the Chinese market). Reducing connectivity is not impossible, but the economic, social, and political costs must be clearly recognized.

The [European Battery Alliance](#) was founded in 2017 with the support of the European Commission and the European Investment Bank to achieve strategic autonomy in one of the most fundamental sectors of the future green and digital economy, with the promise of creating a sustainable and vertically integrated European battery value chain. By 2022, the collaboration will have 750 industrial and innovative members. The EU is [expected](#) to be able to meet 69% of the growing demand for batteries from domestic sources by 2025 and 89% by 2030, producing batteries for up to 11 million cars per year. Total investment along the battery value chain by the Battery Alliance was EUR 127 billion by 2021, and stakeholders plan to invest an additional EUR 382 billion by 2030. The overarching goals of the European Battery Alliance include establishing a regulatory framework for the battery industry, diversifying sources and supply routes for battery raw materials, simplifying and accelerating the approval process for battery raw materials projects at the national and regional level, improving and facilitating access to finance for primary and secondary battery raw materials projects, and establishing national retraining and education programs. The EU's goals are clear: to achieve strategic autonomy for battery production, which means minimizing collaboration with Chinese battery producers.

The plans are very ambitious, but does all this mean that Chinese battery investments and their integration into the European value chain are doomed? To this end, it is worth taking a look at the characteristics of EV supply chains.

## **SOME CHARACTERISTICS OF THE EV SUPPLY CHAIN AND THEIR GEOPOLITICAL IMPLICATIONS**

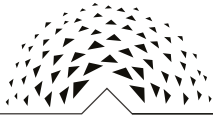
Although several alternative battery technologies are under development, all forecasts indicate that [lithium-ion batteries will be the standard solution](#) for electric cars over the next ten years. Chinese manufacturers were responsible for 77% of the world's Li-ion battery production output in 2021, and the country's

EV battery capacity is still expected to be twice as large as the rest of world by 2031. In addition, China clearly dominates the entire global value chain of the manufacturing process. The most needed chemical substances of a Li-ion battery are graphite, cobalt, lithium, manganese, and nickel. China currently has direct or indirect control of 70% of the world's lithium supply, while its companies also produce 61% of cathodes and 83% of anodes used in the world's batteries. Furthermore, 70% of world's cobalt is mined in the Democratic Republic of Congo, and 80% of that output is transported to China for processing. Argentina has also contracted with China for a large share of its lithium output. For comparison, the EU supplies only [1% of its own needs for key battery raw materials](#), such as lithium, cobalt, and nickel.

To highlight the problem of exposure, the EU has set a target under the [Critical Raw Materials Act](#) to source minimum 30% of refined lithium from the EU by 2030, or to recover at least 20% of rare earth from the relevant waste streams. Given that it traditionally takes many years to open lithium mines, it is highly questionable whether the European efforts can be successful at all. Of course, the EU is also taking steps to diversify its sources of rare earth. The European Commission has adopted strategic partnerships on raw materials with Canada and Ukraine in 2021, and it is looking at Norway, Latin America and Africa, the Western Balkans, and Greenland. Finally, the EU has initiated extensive research into alternative minerals that could replace lithium, for example. Recycling can be an important factor, but it is still hampered by a number of factors that make it [difficult](#) to recycle on a large scale while maintaining economic viability.

China has created a globally dominant position not only in the extraction but also in the processing of raw materials. In 2021, the country accounted for [65% of global battery-grade lithium metal processing capacity](#), and it is expected to keep 56.5% of that market share by 2025. The supply chain vulnerability index developed by [GlobalData](#) shows that beside the United States, Germany is the most exposed country to imports in terms of EV batteries and raw materials. [According to forecasts](#), the dependence of Western countries on China for the mining of rare earth minerals is expected to fall, but they will remain reliant on it in terms of processing capacity.

Amid the rising geopolitical tensions between China and the West, it is not surprising that such exposure has raised security concerns in the EU. The question is whether China would weaponize its battery supply chain dominance in a potential conflict with the countries of the European Union. There is already an example for such an action, in 2010 Beijing [blocked the export of key minerals to Japan](#) due to the territorial disputes of the two countries. Nevertheless, the trends in global battery demand and the development of Chinese manufacturing capacity reflect that Beijing is primarily driven by other motivations. The annual [global demand is expected to near 4,500 GWh](#) by 2030, with China accounting for 40% of that amount. At the same time, China is expected



to [have 3,733GWh of lithium-ion battery cell capacity](#) by 2031, which is roughly the double of the country's projected domestic demand for 2030. Targeting the creation of such overcapacity indicates that China intends to cement its position as the number one exporter of EV batteries globally. Considering that the battery value chain is expected to reach an annual revenue of USD 410 billion by 2030, it is clear that this is a great opportunity for China to make money. This manufacturing capacity is established through huge investments in the industry, and the Chinese state surely wants a return on it.

The same applies to the projects of Chinese battery manufacturers in Europe. Building a gigafactory of EUR 7.3 billion, [as CATL aims to do in Hungary](#), is a long-term investment, and Chinese companies would be reluctant to make such decisions if there was any sign of an intention in Beijing to weaponize the battery raw material supply chain or any sign of a ban on their business operations from the side of EU governments. At the same time, this does not mean that geopolitical tensions would not affect the site selection plans of Chinese battery producers. CATL reportedly [postponed the announcement of its investment project](#) in the USA following the visit of Nancy Pelosi, Speaker of the US House of Representatives in Taiwan in August. Still, the baseline scenario is that Beijing and its flagship battery producing companies are driven by economic development and business considerations.

However, as exposure to Chinese technology is increasingly linked with national security in the EU-level discourse, the chances of a possible decoupling, as already seen in other industries, is growing. Such distancing could proceed along two main scenarios. The first one would aim to create a China-free supply chain and the second to create a Chinese technology-free supply chain. The first means that German OEMs would cut EV battery imports from China, but they would purchase batteries produced by Chinese companies in their European sites. This would contribute to the shortening of supply chains, which has been high on the agenda since the COVID-19 pandemic. This strategy also reduces the exposure of German car manufacturers to future lockdowns in China due to Beijing's zero-COVID policy. The second scenario practically means the exclusion of Chinese technology from EVs made in the EU. Considering the global positions of China as a battery manufacturer and a supplier of raw materials, such a decision would come with a price tag of a slower e-mobility transition in Europe, which would consequently put emission goals out of reach. Yet, rescheduling the transition to e-mobility due to such decoupling would not have as drastic immediate consequences on the EU economy as the reduction of Russian gas supplies has had in this year.

However, the business interests of European, especially German, car makers also point towards a campaign for the exclusion of Chinese battery suppliers being unlikely. China accounts for [38% of Volkswagen's total global production](#), and other major German car makers have also recently decided to [expand their manufacturing activity in China](#). Due to this trend, the automotive industry represented [more than a third of all European FDI in China](#) in the first half of 2022. If the EU banned

the battery technology of Chinese companies, potential retaliatory measures taken by Beijing would most probably target the Chinese operations of German and other European automotive companies, making their global profit outlooks rather gloomy. Altogether, the above-mentioned investment trends strengthen the regional character of the supply partnership between European electric car makers and Chinese battery producers, creating separate ecosystems in the global EV industry.

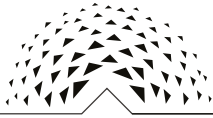
However, there is still one factor that could increase the probability of a complete break-up with Chinese batteries in the future. Technology development paves the way for EVs to be seen as a 'tech product', as [Intel's CEO Pat Gelsinger has already declared](#) them to be computers with wheels. As the tech war between the USA and its allies and China widens, EV technology could become a target of restrictive measures. Since technology sovereignty is also emerging as the new buzzword in Brussels, any dependence on Chinese EV technology could become a more debated issue, especially when we enter the era of autonomous driving. As traditional tech companies launch automotive products and services, the involvement of Chinese companies in the supply chain could become an even more sensitive issue. Car-data security has already been linked with national security concerns. In 2021, the Chinese government [restricted the use of Tesla's vehicles by military staff](#) and employees of key state-owned companies, and later on local authorities [prohibited Tesla cars](#) from entering the district of the Communist Party's summer retreat.

Batteries represent about 40% of the total value of an EV, but the main question is whether they can be seen as a sensitive component from a data security perspective. In that sense, the system software of the car is expected to become a target of technology control sooner. Currently, the market for EV operating systems is still relatively fragmented, and the software component is [referred to as the potential weak link](#) in China's EV dominance. Although it is unlikely that any EV will have software from a single company or country, Western car makers have the opportunity to avoid reliance on Chinese suppliers in this field. This would be an achievement from the tech sovereignty perspective, and it would possibly allow for cooperation with Chinese battery makers in the coming years.

## CONCLUSIONS

This analysis explored the strategies the EU can choose to address clear Chinese exposure to batteries and their production. The European Battery Alliance aims to create an independent European value chain. Based on our analysis of the current situation, we believe that the targets of the European Battery Alliance for 2025 and 2030 cannot realistically be achieved. For one, the EU only produces a small amount of its battery needs from domestic sources (not to mention rare earths, of which it provides 1%), so the targets for the coming years would require





investments that are difficult to achieve. There are also doubts about achieving the recycling target, which remains a promising option rather than a technology that can be implemented at the scale required. Our conclusion also seems to be in line with the expectations of the automotive industry. The intertwining of German companies with Chinese battery manufacturers reinforces the impression that German automotive companies are less serious about a self-sustaining value chain that can be realized in the short to medium term. It is also unlikely that Chinese and other Asian investors would invest billions of euros in the European market if they were seriously concerned that their investments would be crowded out by European companies in the near future.

The question is how necessary it is to achieve the goals of the Battery Alliance. The economic war with Russia is forcing the EU to rethink and rebuild its energy system as Europe teeters on the brink of recession at the end of 2022. Achieving independence goals will divert a large amount of resources from other areas that are urgently needed in the coming years. Dependence on Chinese battery production and the rare earths it requires is a real concern, and these are unilateral dependence risks that theoretically allow China to weaponize these compounds. However, we think it is worth looking at the problem in a more complex way. First, China has built up a battery production capacity that exceeds domestic demand and will secure the country a globally dominant export position in the foreseeable future. Beijing is therefore unlikely to use its dominant position in the supply chain as a weapon unless it is forced to retaliate in an intensifying geopolitical conflict. Moreover, the strategic significance of the European EV industry's dependence on Chinese batteries cannot be compared to the far-reaching economic impact of the EU's energy dependence on Russian resources. A lack of battery supplies would be critical for the electric car industry, but not for the entire European economy. All in all, using its dominance in the electric car supply chain as a weapon in the geopolitical game is not a trump card in China's hands. Third, working with Chinese battery manufacturers at European sites is less risky in terms of supply chain security than importing batteries from mainland China. Moreover, battery factories are very costly investments, and in the event of an escalating economic war, Chinese companies could lose their European sites, making them think twice about giving up their dominant position. Finally, as electric cars increasingly become technology products, there are already concerns about data security. This could make supply partnerships with Chinese battery manufacturers a hot potato in the future, although when it comes to cybersecurity, there are more sensitive components of electric cars than the battery. This means that breaking away from Chinese battery makers is unlikely to be the first step in making electric cars the target of technology control. We believe that European value chains should place at least as much emphasis on establishing dominant positions in certain products within the value chain (e.g. software) as on achieving complete independence. Indeed, reciprocal

engagement reduces the likelihood that China will use European engagement as leverage. For these reasons, the most sensible solution in the medium term might be for the EU not only to consider expanding its own capacities but also to diversify more by supporting the production of other Asian battery manufacturers (South Korea, Japan) in the EU.

We do not claim that the goal of building an independent value chain cannot be achieved in the longer term, at the cost of significant investment. However, it is questionable whether the EU will be able to remain competitive with Chinese producers, which already have considerable experience on a larger scale, and can rely on past and future support from Beijing's [market-distorting subsidies](#). It is not inconceivable that the result of this major effort to create an independent value chain would also create an uncompetitive sector that could dominate the European market through regulation but in return would certainly lose the Chinese market and probably not only the battery market but also the electric vehicle market. The use of administrative instruments could easily lead to a situation of give and take, with the risk of an economic war between the two centres of the world economy. This possibility and its potential risks must be taken very seriously. But there is another aspect. The EU attaches the utmost importance to sustainability. Although there are still question marks regarding the sustainability of the electric car industry (including the recyclability of batteries), the most environmentally damaging part of the EV value chain, namely mining and battery production, will certainly hit the EU harder and generate significant social resistance. If the EU is serious about becoming independent from rare earth mining, it will have no choice but to open new mines. At the same time, it will also have to compete with countries like the USA and Japan, which have similar ambitions. The competition will certainly increase investment costs and could also lead to conflicts between close allies.

Taking all this into account, the Hungarian government's policy of providing a production base for existing European automakers and their associated Chinese battery suppliers does not seem to be an overly risky policy. The complete decoupling from Chinese batteries remains an overoptimistic goal rather than a reality due to the lack of clear interest from economic actors. In the short to medium term, the most cost-effective way to reduce Chinese exposure in the battery sector is to attract other Asian (Korean and Japanese) investments. However, this will not displace Chinese manufacturers, only reduce their weight. For Hungary, this does not represent a major change, as the main investments beside Chinese manufacturers come from South Korean companies in the sector. And even if technological autonomy in battery production in the EU were to increase in the longer term, the know-how and experience of Chinese factories could represent a significant competitive advantage for Hungary.