



CHINA - CENTRAL AND EASTERN EUROPEAN COUNTRIES (CEEC) COLLABORATION ON ELECTRIC VEHICLE MARKET DEVELOPMENT

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Abstract

This paper explores China's collaboration with Central and Eastern European Countries (CEEC), specifically focusing on the partnership with Croatia in higher education, renewable energy, and electric vehicles (EVs). The analysis underscores China's dominance in the global EV market with more than half of worldwide EV sales and charging station installations. On the contrary, despite Croatia's lower overall EV sales, the country is still recognized in the EV market, particularly through the presence of Rimac. The electric vehicle industry in China is witnessing an accelerated growth trajectory, outpacing developments in Western countries. The China-CEEC collaboration could serve as a potential stepping-stone for the Chinese EV companies to enter the EU market and cooperation could play a substantial role in the global EV market's future dynamics, acting as a bridge for Chinese companies to successfully navigate the European landscape. In the context of the article, it should be mentioned that it is predicted that China will also look for ways of cooperating with Croatia in the fields of green power, smart grids, and technologies for collecting solar energy.

Keywords: China-CEEC, Electric vehicles, Innovation, International Trade, EV market, automotive industry

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1 INTRODUCTION

On April 26, 2012, the China-Central and Eastern European Countries (CEEC) Cooperation was inaugurated, establishing a cross-regional



collaborative platform rooted in longstanding friendship. Driven by a collective aspiration for mutually beneficial cooperation and shared development, the initiative has witnessed dynamic growth. Encompassing diverse domains such as economy, trade, culture, education, youth exchange, agriculture, tourism, science, technology, health, and think-tank exchange, the collaboration has proven fruitful. Beyond its multifaceted impact, the China-CEEC Cooperation has played a pivotal role in fortifying bilateral ties between China and Central and Eastern European nations, contributing significantly to the broader enrichment of China-Europe relations (China-CEEC, 2021).

Official diplomatic relations between the People's Republic of China and the Republic of Croatia were inaugurated in May 1992. Over three decades, this relationship has evolved into a remarkable collaboration, extending beyond diplomatic spheres to encompass higher education and renewable energy initiatives. Notably, the partnership between Beijing Sport University and the University of Zagreb has expanded from sports to the academic realm, marking the first agreement between the universities of China and Croatia. Furthermore, in the field of higher education, the Zagreb School of Economics and Management has fostered collaboration with eight Chinese universities. This robust academic engagement complements the growing presence of Chinese companies in Croatia, particularly evident in the completion of landmark projects such as the Peljesac Bridge. Noteworthy is the collaboration in the renewable energy sector, exemplified by the 156-megawatt Senj wind farm, a testament to the largest Chinese investment in Croatia to date. This multifaceted collaboration underscores a thriving relationship built on mutual respect, appreciation, and exemplary cooperation despite differences in size, geography, or economic strength (China-CEEC, 2022).

Prime Minister Plenkovic's endorsement of the China-CEEC Cooperation as "an excellent tool for all of us in Central and Eastern Europe" highlights

its instrumental role, fostering numerous signed contracts, regular dialogue, and mutual understanding. Importantly, Plenkovic underscores the need for heightened cooperation and dialogue between China and the European Union, particularly concerning global challenges such as security, peace, and climate change, with a specific emphasis on the energy sector. He notes, "We have witnessed the spike of energy prices, and I think in that respect, the global dialogue on energy issues and energy supplies is where the EU and China should cooperate, and that, of course, includes Croatia" (China-CEEC, 2022b).

Building upon the foundation of the China-CEEC Cooperation and the multifaceted collaboration between China and Croatia, it becomes imperative to explore the dimensions of sustainability within this partnership. As we delve into the various sectors encompassed by this collaboration, a particular spotlight turns toward sustainable practices, notably in the realm of electric vehicles.

Rimac Automobili, a prominent player in the electric vehicle industry, closed a significant 30 million EUR investment deal with Camel Group Ltd., Asia's largest battery manufacturer based in China, in 2017. This substantial investment marks the single largest foreign direct investment in a Croatian technology company and aligns with Rimac's mission to redefine electric-powered vehicles. The funds will not only benefit Rimac's sister company, Greyp Bikes, but also support the launch of new products, expansion of production capacity, and global outreach. The strategic partnership underscores Rimac's position as a go-to technology provider for global automotive manufacturers and highlights its profitable trajectory since 2012. Camel Group's CEO, Liu Changlai, emphasizes the synergies between Rimac and Camel Group in delivering world-class EV components and technologies, further catalyzing the transition to a fully electric fleet. This investment adds another layer to the multifaceted collaboration narrative, showcasing the evolving landscape of sustainable practices, particularly in the electric vehicle sector, within the broader

context of international cooperation and innovation (Rimac, 2017).

Continuing the narrative of development and the collaborative efforts between China and Europe in the electric vehicle sector, the momentum continued to grow with a notable development in July 2022. When Hungary's Minister of Foreign Affairs and Economic Affairs, Peter Sialto, and Zhang Hui, Vice President of NIO Europe, jointly announced a significant initiative in Budapest—the establishment of the NIO Energy European Factory (He, Huang, Yao, Chen, & Chen, 2023).

2 ELECTRIC VEHICLE MARKET ANALYSIS

China's Electric Vehicles market is projected to achieve a revenue of US\$292.1 billion in 2023. With a projected steady annual growth rate of 6.38% from 2023 to 2028, the market is forecasted to achieve a volume of US\$398 billion by the conclusion of this period. Fueled by increasing demand, an estimated 8.77 million EV units are expected to be sold in China by 2028, reflecting a rising trend in consumer acceptance. The volume-weighted average price of EVs in China is forecasted to be US\$46.9k in 2023. Notably, China is set to lead the global EV market in 2023, emphasizing its dominant role, driven by government subsidies and robust infrastructure supporting swift adoption (Statista, 2023a).

The electric vehicle industry in China is witnessing an accelerated growth trajectory, outpacing developments in Western countries. A notable aspect of this evolution is the proactive engagement of many Chinese automobile manufacturers in high-value activities. Driven by a desire to internationalize their presence, these manufacturers are strategically positioning themselves to introduce their cutting-edge electric vehicles into the global market. This shift underscores a decisive effort by Chinese automotive entities to position themselves at the forefront of innovation and market leadership in the rapidly evolving domain of electric vehicles (Wang, Chen, Wang, Ning, & Vanhaverbeke, 2014). Numerous Chinese electric vehicle firms, including SAIC, BYD, and Great Wall Motors, have demonstrated a notable proficiency in electric vehicle technology, surpassing that of traditional

leaders in the automotive industry (Wang & Kimble, 2013).

Chinese electric vehicle firms currently hold relatively modest market shares in European markets. An illustrative example is BYD, a prominent Chinese EV leader, which delivered a mere 1500 units of passenger EVs to Norway in 2021. This limited market expansion may be attributed to unforeseen challenges that Chinese firms are encountering. Consequently, the present scenario prompts an inquiry into the adequacy of ownership advantages possessed by Chinese EV firms for achieving success in the European market and competing effectively with local rivals. Furthermore, an examination of the potential disadvantages that these Chinese firms might confront becomes a focal point of interest in understanding their position in the European EV market (Gu, Belussi, & Narula, 2023).

Chinese electric vehicle firms have surpassed their European counterparts in large-scale EV manufacturing. In 2021, Great Wall Motor, BYD, and NIO collectively produced 1,265,269, 737,502, and 92,921 EV units respectively. This contrasts with European leaders like Volkswagen, whose EVs accounted for only 20% of the total production of 1,734,973 cars. Notably, Audi produced 781,612 units with EVs constituting just 10%. The superior production capacity of Chinese firms is attributed to an established industrial cluster, particularly in the east and south of China, streamlining operations across multiple provinces. This cluster approach allows firms like SAIC to seamlessly integrate research, purchasing, and manufacturing, optimizing efficiency and reducing costs associated with transportation and communication (Gu, Belussi, & Narula, 2023).

Figure 1 outlines total battery electric vehicle (BEV) and plug-in hybrid electric vehicle (PHEV) sales in million units for both China and the global market from 2020 to 2023, along with projected sales extending to 2028. In 2020, China constituted 41.20% of the worldwide total, recording 1.31 million vehicle sales. This share increased to 50.61% in 2022, with China's sales reaching 6.09 million units. Projections indicate a continued upward trend, with an anticipated 51.53% of the global total in 2028, representing 8.77 million vehicle sales.

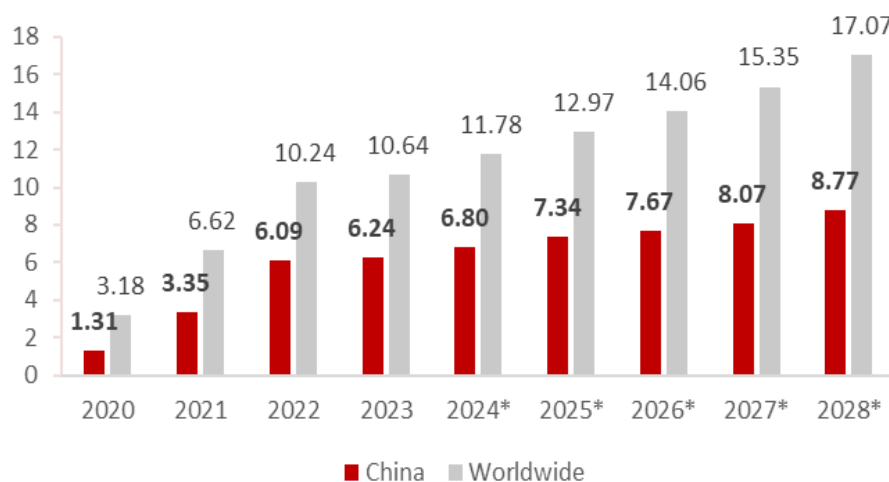


Fig. 1 Global and Chinese vehicle sales in million vehicles

Source: (Statista, 2023a)

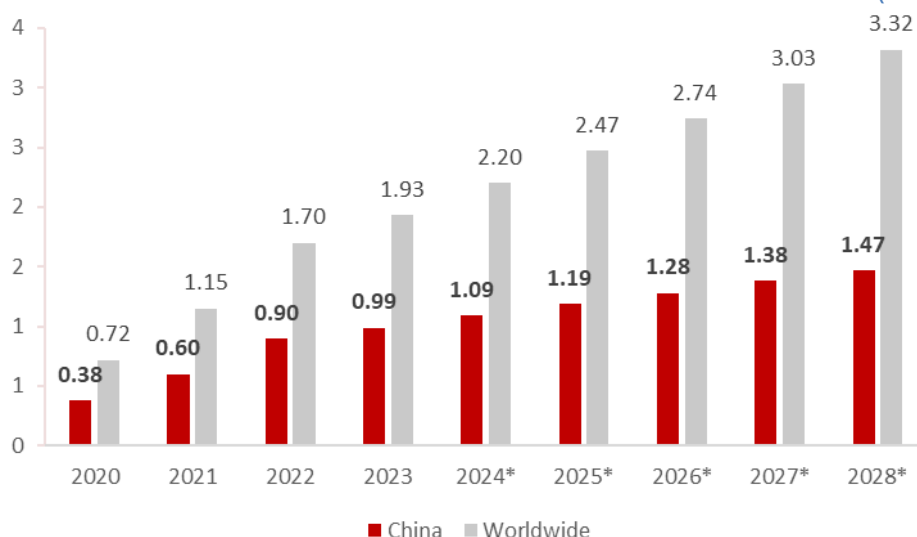


Fig. 2 Global and Chinese charging stations installed in million charges

Source: (Statista, 2023a)

China has been at the forefront of supporting the electric vehicle sector by offering subsidies since 2009. The government's sustained commitment to subsidizing EV producers engaged in public transport, taxis, and the consumer market has been instrumental in fostering the growth of the EV industry. Over the period spanning from 2009 to 2022, China allocated more than 200 billion yuan (US\$28 billion) towards EV subsidies and tax incentives, solidifying its position as a global leader in the adoption and promotion of electric vehicles. Additionally, China's commitment is further underscored by a comprehensive policy framework that includes exemptions from consumption tax and vehicle & vessel tax for carmakers involved in EV production,

subcontracted processing, and importation. Until the end of 2022, substantial purchase subsidies incentivize various vehicle types, including a maximum subsidy of 12,600 yuan for battery electric vehicle (BEV) passenger cars and 4,800 yuan for plug-in hybrid (PHEV) passenger cars. Furthermore, the subsidies extend to non-fast-charging BEV buses (50,400 yuan), fast-charging BEV buses (36,400 yuan), PHEV buses (21,300 yuan), BEV trucks (28,000 yuan), and PHEV trucks (17,600 yuan). The purchase tax exemption, in effect until the end of 2027, exempts new EVs purchased by December 31, 2025, and reduces the purchase tax by half for those bought between January 1, 2026, and December 31, 2027. (Yu, 2023).

The Electric Vehicles market in Croatia is projected to achieve a revenue of US\$144 million in 2023. With an anticipated robust annual growth rate of 24.51% from 2023 to 2028, the market is poised to reach a projected volume of US\$430.9 million by the end of this period. Fueled by growing demand, the market foresees the sale of 7,853 EV units in Croatia by 2028, indicating a positive trajectory in consumer acceptance. In 2023, the volume-weighted average price of Electric Vehicles in Croatia is forecasted to be US\$ 54.4k, providing insight into the pricing dynamics within the market (Statista, 2023b).

Croatia has implemented a comprehensive set of incentives to propel the adoption of electric vehicles. These encompass registration tax benefits, exempting electric vehicles from excise duties, and ownership tax benefits, relieving owners from special environmental taxes. Notably, the government offers substantial purchase subsidies, with co-financing of up to €9,291 for BEVs and hydrogen cars, €5,309 for low-emission plug-in hybrids, and €2,640 for electric ATVs, motorcycles, and mopeds. The Ministry of Environmental Protection and Energy allocated €11.9 million in 2021, extending into 2022, to incentivize private and business purchases of BEVs. Furthermore, Croatia actively supports EV infrastructure, allocating €1.32 million in 2020 for the co-financing of charging stations. These measures collectively create a favorable environment, encouraging both individuals and businesses to embrace electric vehicles and contribute to sustainable transportation solutions (European Commission, 2023).

3 CONCLUSIONS

This paper exported the intricate collaboration between China and Central and Eastern European Countries (CEEC), focusing on the partnership with Croatia across higher education, renewable energy, and electric vehicles (EVs).

The China-CEEC Cooperation, initiated in 2012, has proven to be a dynamic platform fostering fruitful collaborations in various domains. Despite China's overwhelming dominance in the global EV market, Croatia, notably through Rimac Automobili, has carved a niche, showcasing the potential for unique contributions from smaller nations.

The collaboration has strengthened bilateral ties and positioned itself as a potential steppingstone for Chinese EV companies to enter the European Union market. The endorsement of the China-CEEC Cooperation by Prime Minister Plenkovic highlights its instrumental role in fostering dialogue, understanding, and mutually beneficial contracts, especially in addressing global challenges like energy security and climate change.

As we navigate the sustainable dimensions of this partnership, the strategic investment in Rimac Automobili by China's Camel Group and the establishment of the "NIO Energy European Factory" in Hungary underscore the evolving landscape of sustainable practices in the EV sector. The continued growth of the EV market in China, supported by government subsidies and infrastructure, contrasts with the emerging market in Croatia, driven by comprehensive incentives and a positive consumer outlook.

The China-Central and Eastern European Countries (CEEC) Cooperation has the potential to significantly influence the future dynamics of the global electric vehicle (EV) market, serving as a conduit for Chinese companies to effectively navigate the European market. This partnership not only signifies a strategic convergence of economic interests but also highlights the potential for meaningful international collaboration and innovation in advancing sustainable transportation solutions.

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