



THE PENINSULA

South Korea's Battery Industry Faces Challenges

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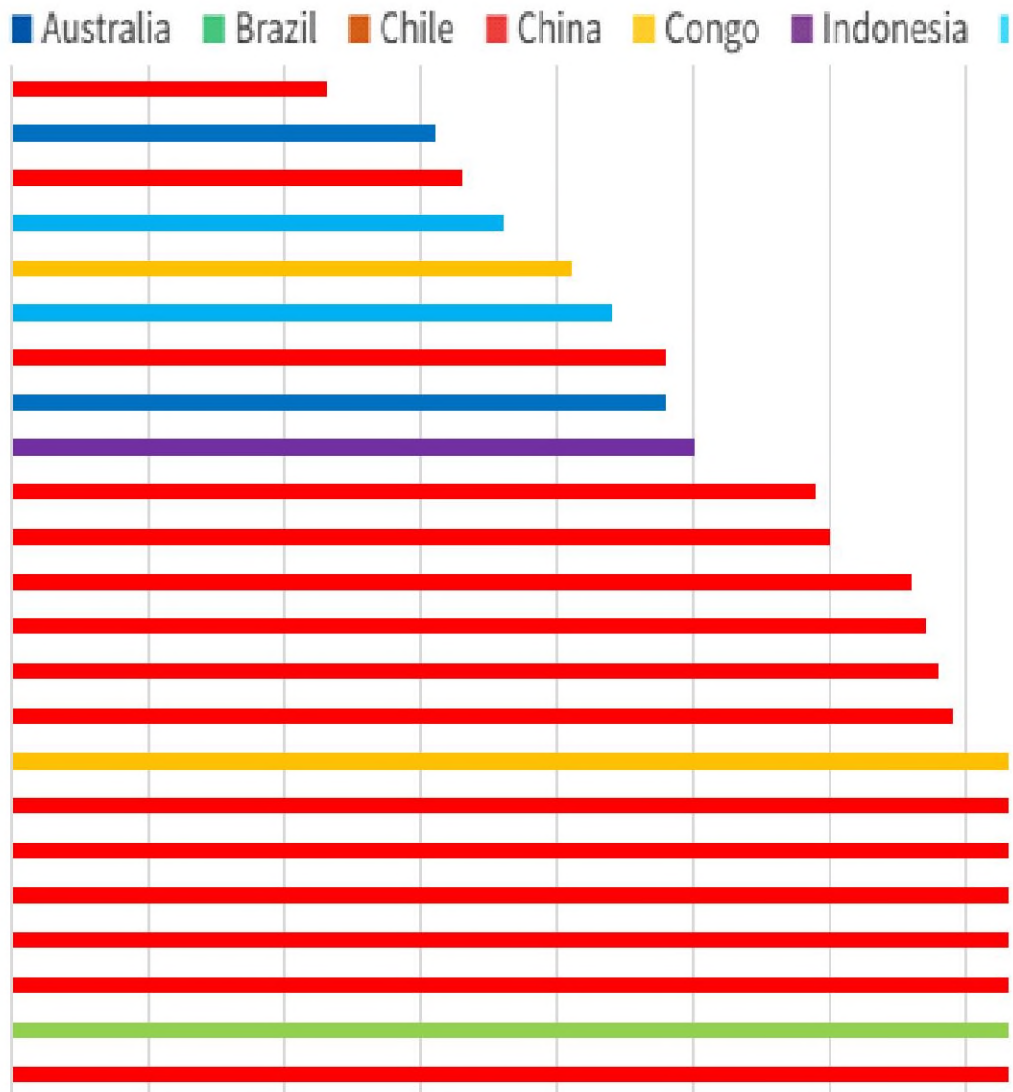
Category: [Indo-Pacific](#)



Resource security has become increasingly important for economic stability and national security. The global economy is experiencing geopolitical instability, trade wars, and the weaponization of national resources. As an export-dependent economy, South Korea is particularly vulnerable. According to the Korea International Trade Association (KITA), of Korea's 12,586 total imported items in 2021, it relied on a single country for at least 80 percent of its imports for 3,941 items, or nearly one-third of its total imports. China was the source for 1,850 of those imports, far ahead of the United States (503 items) and Japan (438 items).

China was the world's largest producer of fifteen of twenty-three key critical minerals, including rare earth minerals, in 2023 (Figure 1). Its dominance is particularly concerning for Korea in the context of growing tension between the United States and China, its two largest export markets. Supply chain concerns are particularly prevalent in the battery industry, which is driven by the rapid growth in sales of electric vehicles (EVs). Indeed, EV sales rose by 25 percent in 2024 to 17 million globally.

Figure 1. The World's Top Producers of Select Critical Minerals in 2023



Source: The Minerals Security Partnership Under the South Korean Leadership (CSIS)

Korea Ranks Second in the Global Battery Market After China

China dominates the battery market, producing around three-quarters of the batteries sold globally in 2024. Fierce competition in China's battery market, which has nearly 100 producers, and supply chain integration contributed to a 30 percent drop in its battery prices last year, the largest in the world. The Chinese battery ecosystem covers all steps in the supply chain, from mineral mining and refining to the production of battery manufacturing equipment, precursors, and other components, as well as the final production of batteries and EVs. In China, batteries are cheaper than in Europe and North America by over 30 percent and 20 percent, respectively. Consequently, EVs in China are less expensive than their conventional counterparts.

Korea is the world's second-largest battery producer, with a share of around 20 percent in 2024, followed by Japan with 7 percent. Three Korean producers—LG Energy Solutions, SK On, and Samsung SDI—rank among the top six battery producers globally. In addition, Korean firms lead in overseas manufacturing capacity, with nearly 400 gigawatt-

hours (GWh) compared to Japan's 60GWh and China's 30GWh. However, Korea has been losing market share in China and the European Union (Figure 2, Panels A and B). Indeed, Korea's EU share fell from 78 percent in 2022 to 61 percent in 2024, while China's share rose from 22 percent to 38 percent. Increased Chinese sales were driven by exports of less expensive lithium iron phosphate (LFP) batteries. However, Korea's market share in the rest of the world (excluding China and the European Union) rose slightly from 44 percent to 47 percent between 2022 and 2024 (Figure 2, Panel C).

Figure 2. Korea's share of the EU battery market has fallen as Chinese producers gain

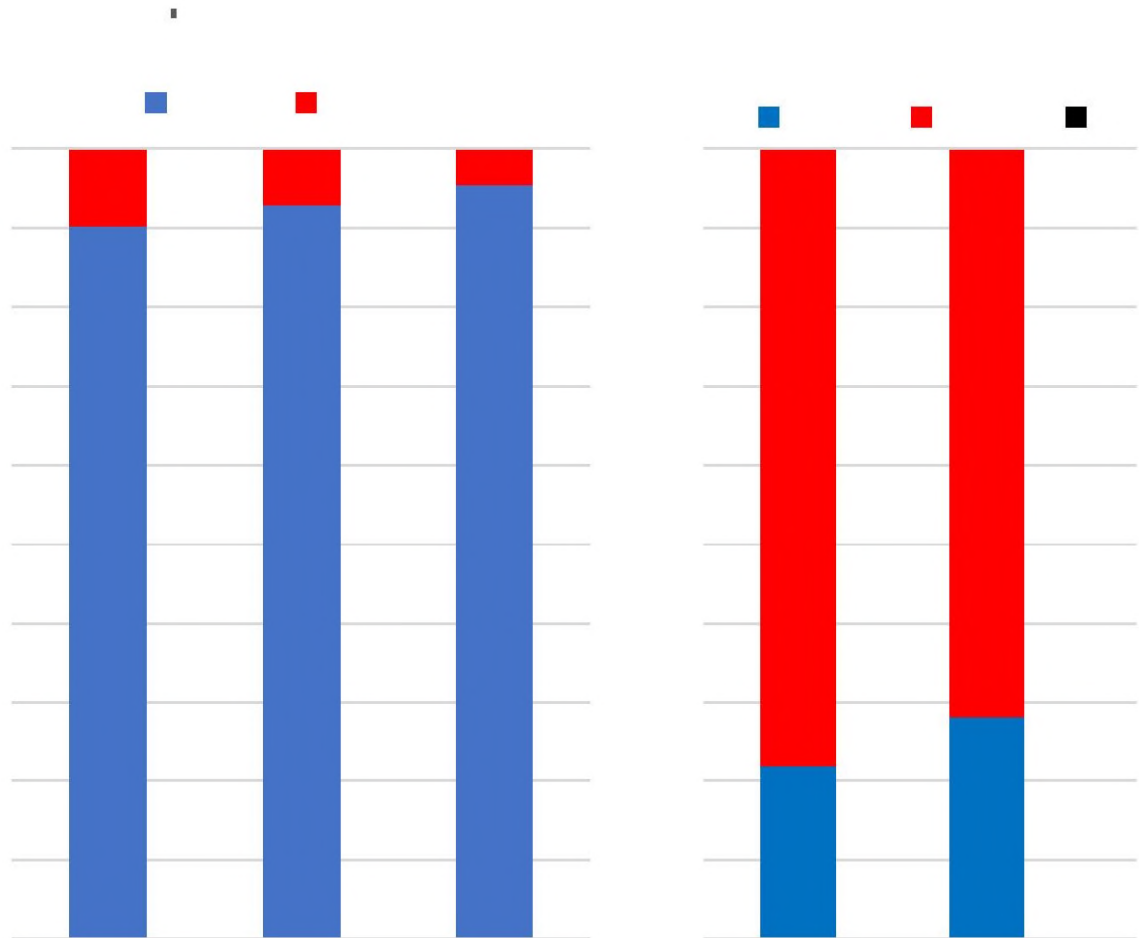


Figure depicts the share of electric car battery sales by manufacturer's domicile, 2022-2024 | Source: The battery industry has entered a new phase (IEA)

Challenges Facing Korean Battery Producers

Korean battery producers rely heavily on China for materials. China provides 96.6 percent of Korea's precursor cathode materials, 93.7 percent of its synthetic graphite, and 80.4 percent of its lithium hydroxide. This heavy reliance exposes the country to supply disruptions, price fluctuations, and geopolitical risks. Indeed, China tightened its controls on rare earth metals in the context of the U.S.-China trade dispute.

A larger role for Korea in the global battery industry would ease U.S. economic and security concerns about China's dominance in the sector. However, Korean firms' dependence on China for critical minerals and battery components noted above remains

problematic. The [U.S. Inflation Reduction Act](#) (IRA) required that at least 50 percent of the value of battery components be produced or assembled in North America to qualify for a USD 3,750 tax credit on EVs. An additional tax credit of USD 3,750 is available if at least 40 percent of the value of critical minerals was sourced from the United States or one of its free trade partners. Although these tax credits will be eliminated in September 2025, China is likely to remain a “foreign entity of concern” in the battery and EV industries.

Korean battery producers also face challenges in Europe. The EU battery law, which focuses on sustainability concerns, establishes an EU “[battery passport](#).” It will take effect in 2027 for all industrial batteries with a capacity exceeding 2 kWh. The passport will document each battery’s lifecycle from its manufacture to use and recycling in line with the European Union’s aim of promoting a “circular economy.” The law mandates carbon emissions, raw material origin, chemical composition, and disposal instructions.

Weaknesses in Korea’s domestic carbon tracking platform may hinder its ability to qualify for an EU battery passport. The country’s battery recycling and reuse infrastructure lags behind global leaders. While the government offers low-interest loans to encourage recycling, studies show that only a quarter of waste batteries are recovered through formal channels. Technological bottlenecks, fragmented certification systems, and weak recycling incentives limit progress in this regard.

Policies Promoting National Resource Security Are Crucial for Korean Battery Producers

Weak supply chain diversity creates vulnerabilities for global leaders in advanced technology manufacturing, including the United States and Korea. According to the Korea Institute of Geoscience and Mineral Resources, Korea’s [net import reliance](#) for all critical minerals is 99.7 percent. China’s export restrictions on gallium and germanium in 2023 were a major concern for Korea’s world-leading semiconductor industry.

The Special Act on National Resource Security, which took effect in February 2025, established comprehensive policies to prepare for and respond to resource security crises, including those related to energy sources, minerals, and materials essential for renewable energy technologies. The legislation created a Resource Security Council chaired by the Minister of Trade, Industry and Energy to coordinate policies. The ministry has identified thirty-three critical minerals and prioritizes ten of them as strategic minerals for high-tech industries, such as EVs and batteries. Other [key initiatives included in the act](#) are: i) implementing an early warning system to monitor and respond to resource security threats; ii) requiring the stockpiling of core resources by designated organizations; iii) authorizing emergency measures during crisis situations, including price controls and supply allocation; and iv) promoting international cooperation to increase resource security. Korea aims to reduce its import dependency on critical minerals to 50 percent by 2030.

Given Korea’s dearth of domestic mineral resources, it focuses heavily on import security by reducing trade disruptions and finding new import sources. Korea is diversifying its supply chain through diplomatic and commercial partnerships. For example, several Korean companies have invested in nickel refining in Indonesia to support battery production. Korea has signed an [agreement with Canada](#), which holds the world’s sixth-largest lithium and seventh-largest cobalt reserves. In addition, it ranks in the top ten in reserves of nickel, graphite, and rare earth elements. At the first-ever [Korea-Africa Summit](#) in 2024, Korea and the forty-eight participating African countries created the Korea-Africa

Critical Minerals Dialogue to enhance “cooperative efforts to ensure the stable supply of critical minerals and promote technology collaboration related to critical minerals.” Africa is a key partner, given that it holds **about 30 percent** of the world’s critical mineral reserves. The summit resulted in nearly fifty cooperation agreements covering mining, infrastructure, and battery supply chains.

Conclusion

Strengthening international partnerships with countries holding critical minerals is essential to secure a reliable supply of critical minerals. Korea is trying to achieve this through bilateral agreements and multinational approaches, such as the **Mineral Supply Partnership**, which the country has led since 2024. Government financial support may be necessary to encourage domestic companies to invest in overseas mineral investments. In addition, Korea should accelerate its progress toward a circular economy by promoting recycling. Such an approach would reduce import dependence and increase domestic value-added. To prepare for resource security crises, Korea should establish an effective early warning system to respond to resource security threats and stockpile core resources.

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