

Review

The Emerging Electric Vehicle and Battery Industry in Indonesia: Actions around the Nickel Ore Export Ban and a SWOT Analysis

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Abstract: As the automotive industry shifts from internal combustion engine (ICE) vehicles to electric vehicles (EVs), many countries are setting new strategies in their transportation sector. The Li-ion battery is currently the most common battery used in EVs due to its high energy density, durability, safety, and cost competitiveness. Nickel is predicted to be an essential component for the lithium nickel cobalt manganese oxide (NMC) as a cathode material of choice for EV applications. Indonesia, one of the world's largest nickel ore suppliers, put an export ban on nickel ore effective from 2020. The bold movement was intended to initiate the domestic EV industry and encourage investors abroad to drive their manufacturing activities into the country. On the other hand, the global Li-ion battery manufacturers who imported nickel from Indonesia had to re-strategize their businesses. This review discussed the chronological events leading to the ban and after the ban from the media, government regulations, and literature reviews. The authors of this study also conducted interviews and attended seminars with the national experts and key players in the battery and EV industry to gain their most pertinent insights. The SWOT analysis of the reviewed materials indicated that while the Indonesian battery industry is still new, it needs to diversify its research and development activities and collaborate internationally to optimize the utilization of its resources and meet the purchasing power of the domestic EV market. Finally, this study summarized six key factors to support Indonesia's ambition to be a new regional hub for EVs. These factors are: (1) pricing, (2) technology, (3) policy, (4) investment, (5) infrastructure, and (6) compliance with sustainability standards.

Keywords: battery; electric vehicle; EV battery materials; nickel; Li-ion battery; cathode



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