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STATE OF LITHIUM-ION BATTERY RECYCLING IN SOUTH KOREA

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ABSTRACT

Recently, electric vehicles (EVs) have been recognized as useful measures to dramatically reduce emissions such as greenhouse gas and fine dust. With the spread of EVs, the scale of waste batteries emitted from EVs will inevitably increase as well. According to the Korea Energy Economics Institute, the number of waste Li-ion batteries will increase by more than 500 times compared to 2020 in 2029(~80,000). Therefore, various methods are being considered, such as reusing the generated waste Li-ion battery as an energy storage system (ESS) or extracting metals (Li, Co, Ni) by hydrometallurgical and pyrometallurgical processes.

The three Korean Li-ion battery manufacturers, which account for 44.1% (B3, 2020) of the global market, are paying attention to the recycling of waste batteries. This is not only to contribute to the Carbon-Neutral goal by reducing carbon emissions by recovering the metals, but also to enable a stable supply of lithium, cobalt, and nickel. In addition to the three battery manufacturers, more and more companies are engaged in the business of recycling waste Li-ion batteries. SungEel HiTech Co., Ltd has already commercialized hydrometallurgical recovery systems from waste Li-ion batteries and is currently preparing to launch Europe's largest EV battery recycling plant in Hungary. Most battery recycling companies in South Korea recover critical metals by hydrometallurgy (LX-SX), but pyrometallurgy such as refining of copper and zinc, is also being considered due to the price of extractants used in separation and purification and wastewater generated.

Currently, cell producers supply 90% of the raw materials, and 10% is supplied through consumers' second-hand products such as spent IT devices. Since it is expected that waste Li-ion batteries emitted from EVs will account for 90% of the total in the future, industry-university-research is creating an ecosystem with a stable supply chain through policy and technical support.

Keywords: Lithium-ion Battery, Recycling, Electric Vehicle, South Korea