expected ROI of nickel manganese cobalt battery project in Switzerland 20

Will lithium & cobalt produce more manganese in ?The quantities of material demand for manganese used in LIBs are low in contrast to the high global production volume. However, the calculation for lithium and cobalt predicts a higher material demand in than the production volume of these battery metals in . In the case of nickel, it depends on the technology and growth scenario. How much lithium & cobalt will be recycled by ?Cumulatively, recycling could supply about 105 kt of lithium (LCE), nickel, cobalt and manganese by , with volumes potentially more than tripling to 390 kt by . These recovered materials could meet 11%-19% of the demand from EVs and ESS by and 19%-53% by , depending on the metal and evolving battery chemistries. Will recycled cobalt meet the demand for EV batteries?By already, recycled cobalt could meet up to 19% of the demand. As batteries with legacy chemistries higher in cobalt content reach end of life and cobalt demand from EV and ESS batteries start plateauing around , the share of recycled cobalt relative to total demand is projected to double to 40% by and reach 53% by . Will NMC dominate the battery market in ?The high nickel content improves the capacity of the materials and, for instance, increases that of an NMC 811 by almost 50% compared to NMC 111 to about 200 mAh/g (Research Interfaces). It is predicted that NMC with various compositions will dominate 75% of the battery market in (Zhao). 3.2.1. Medium-Ni materials Will battery chemistry reduce cobalt reliance?Although battery chemistry is evolving to reduce cobalt reliance, McKinsey forecasts a 7.5% annual increase in absolute cobalt demand until . This growth highlights issues around sourcing transparency and price volatility, with companies prioritising ethical and sustainable practices in response. When will high-nickel NMC batteries be recycled?As European gigafactories scale up production of high-nickel NMC batteries, significant volumes of production scrap are expected to become available for recycling in the late 2020s. By the early 2030s, recycled nickel is expected to cover 12% of demand. McKinsey: How Sustainable is the Battery Supply?Here, Scope 3 Magazine takes a closer look at key materials including lithium, nickel, cobalt and manganese as McKinsey reveals the complexities of ensuring a sustainable A forecast on future raw material demand and recycling potential This study focuses on the future demand for electric vehicle battery cathode raw materials lithium, cobalt, nickel, and manganese by considering different technology and Battery recycling reportEnd-of-Life batteries and scrap from battery gigafactories in Europe have potential to provide 14% of all lithium, 16% of nickel, 17% of manganese, and a quarter of cobalt demand by already. What Impact are EVs and Renewables Having on Raw Materials?With only modest increases in HPMSM production projected and a fraction of demand expected to be met by , this highlights significant supply challenges ahead. McKinsey: EV Growth Tests Raw Material Supply ChainsA McKinsey report warns that base-case supply may fall short of demand, leading to shortages, price fluctuations and substantial investment requirements. Here, we explore the Nickel Manganese Cobalt (NMC) Battery Market Forecasts to According to Stratistics MRC, the Global Nickel Manganese Cobalt (NMC) Battery Market is accounted for $25.8 billion in and is expected to reach $81.7 billion by McKinsey: Is the Battery Supply Sustainable?By , this figure is projected to increase to 95%. Innovations such

as direct lithium extraction are progressing, yet demand continues to outpace supply, underscoring the From waste to value: the potential for battery recycling End-of-Life batteries and scrap from battery gigafactories in Europe have potential to provide 14% of all lithium, 16% of nickel, 17% of manganese, and a quarter of cobalt demand by already. Analyzing the global warming potential of the production and The paper presents a cradle-to-gate (CTG) life cycle assessment (LCA) of nickel-manganese-cobalt (NMC) chemistries for battery electric vehicle (BEV) applications.North America's Potential for an Environmentally The Detroit Big Three General Motors (GMs), Ford, and Stellantis predict that electric vehicle (EV) sales will comprise 40-50% of the annual vehicle sales by . Among the key components of LIBs, the Lithium-ion battery recycling goes large | C&EN Recyclers also have to contend with a range of other battery chemistries--older formulations and those used in portable electronic devices, which include lithium cobalt oxide, lithium manganese oxide, and nickel cobalt Commission selects 47 strategic projects to secure access to raw Notably, multiple initiatives focus on lithium (22), nickel (12), cobalt (10), manganese (7), and graphite (11), strengthening the EU battery value chain. With these efforts, What Impact are EVs and Renewables Having on Raw Materials?The Democratic Republic of Congo (DRC) produces 64% of the global cobalt output, largely as a by-product from copper and nickel mining. Despite the decreasing role of Battery : Resilient, sustainable, and circularBattery : Resilient, sustainable, and circular Battery demand is growing--and so is the need for better solutions along the value chain. McKinsey: Is the Battery Supply Sustainable?McKinsey reveals battery raw material outlook on lithium, nickel and cobalt as demand for these materials may soon outstrip base-case supply The electrification of Battery recycling reportThe estimated recovery of 105 kt of lithium (LCE), nickel, cobalt and manganese from recycling in Europe by could enable the production of 1.3 to 2.4 million battery electric cars (or 14% to

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