Congo Republic nmc and lfp battery

Could lithium iron phosphate (LFP) cathodes split the EV battery market?
The transition back to using lithium iron phosphate (LFP) cathodes in electric vehicle (EV) batteries from nickel manganese cobalt (NMC) poses a challenge to recyclers and could split the market,attendees at the Future Battery Forum in Berlin heard on Tuesday.

Are NMC cathodes vulnerable to disruptions in China?
World supply is currently vulnerable to disruptions in China for both chemistries: 80% [71% to 100%]of NMC cathodes and 92% [90% to 93%]of LFP cathodes include minerals that pass through China. NMC has additional risks due to concentrations of nickel,cobalt,and manganese in other countries.

Where are LFP batteries made?
The LFP transition is driven by China,which accounted for about 95pc of the LFP batteries produced last year. Just 3pc of light-duty vehicles with LFP batteries were manufactured in the US in 2022.

How much cobalt does the DRC produce?
The DRC currently provides around 70%of the global cobalt supply,partly through artisanal mining,which provides livelihood for almost 200,000 people (BGR 2019; OECD 2019).

Is direct recycling profitable for LFP & LMO?
Direct recycling,which reduces intermediate processing steps to recover a larger proportion of the metals and chemicals,is marginally profitablefor LFP and LMO but NMC and nickel-cobalt-aluminium recycling generates about $10/kWh of profit in the US and Europe and closer to $20/kWh in South Korea and China.

Are artisanal cobalt mining accidents a problem in the DRC?
The low estimate of the accidents in artisanal cobalt mining in the DRC is about 30 times lower than the high estimate, making the contribution comparable to accidents in other parts of the product system.

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Literature Review: We conducted a thorough review of current literature on the performance characteristics and advancements in LFP and NMC battery technologies from 2020 to 2024. They consisted of peer-reviewed articles as well as industry reports from Google Scholar, ScienceDirect, among others.

We compare the nickel manganese cobalt (NMC) and lithium iron phosphate (LFP) cathode chemistries by (1) mapping the supply chains for these four materials, (2) calculating a vulnerability...

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Summary:In this episode, we comprehensively analyze the shift from Nickel Manganese Cobalt (NMC) to Lithium Iron Phosphate (LFP) batteries in the global energy sector. The central theme is the impact of this technological change on the Democratic Republic of Congo (DRC), a major cobalt producer. The analysis examines the economic, ethical, and environmental implications ...

6 ???· Battery operation at high temperatures (over 40 °C) provides a relatively high charging speed but increases the rate of surface electrode interface (SEI) growth, which in turn shortens the battery life (insert values). For example, K. Amine et al. considered the aging of the LFP battery at room temperature (RT), 37 °C, and 55 °C . It was ...

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NMC (39%) battery and LMO (3%) battery (Han Hao et al., 2017). Nearly all electric vehicles today use NMC or NCA chemistries so looking at the production and GHG emissions of a NMC battery should give a good idea on the scale of emissions from vehicle batteries.

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