

Rethink Energy recently produced a report, available for purchase here, that analyzes the surge in battery [raw material](#) demand in the near future. The answer to the question “Can the mining industry keep up?” is a qualified “yes.” It may be a bumpy road with supply constraints affecting the commodity price.

Rethink Energy expects that [lithium](#) supply will be under strain until 2026, producing price volatility.

“The **Chinese EV** market will remain the most important determining factor of lithium spot prices due to its oversized influence that will remain until Europe and North America set up their own supply chains.”

Low-volume luxury markets will mean that demand for nickel and cobalt-based chemistries will become increasingly localized to North America while lower cost materials are likely to be used in the high-volume markets in the rest of the globe. Although the US can produce artificial graphite using cheap electricity and petroleum coke, the issue will be US refining capacity. Canada may be able to supply some mined graphite, but its mines will have to be approved by regulators. China will remain the main supplier of graphite for some time.

Australian mining companies are looking at graphite as the next lithium.

“[Manganese](#) demand will scale with NMC cathode production and will increase significantly with the advent and following acceleration of LMFP production,” Rethink Energy adds.

“Platinum demand will be moved from the production of catalytic converters to semiconductor manufacturing in a redistributive measure.”

Rethink Energy expects that the battery chemistries used in Europe will shift towards LMFP through Chinese exports and expatriate manufacturing. China appears to moving in that direction already. The IRA is encouraging the use of chemistries that can be produced without Chinese companies. Nickel and cobalt demand within the US is expected to rise as is the necessary phosphate or nitric acid production.

“From 2022 to 2032 the global battery market for EVs will grow from 450GWh of capacity to 2,340GWh, fuelled by regional bans on ICE vehicle sales in China and Europe, leading up to that point.”

The **IRA** has enticed battery manufacturing back to the USA. As the battery cost is one third of the cost of an EV, the price of battery materials plays a big role as carmakers engage in a price war. Tesla has dropped its prices significantly in recent months. It is possible that as range anxiety falls in the US, more affordable cars with smaller batteries that charge faster may impact the market.

Ford, the second largest producer of EVs in the US has established a subsidiary to cooperate with Chinese-owned CATL. “Ford has discussed at length with the Department of

Commerce exactly what is permitted under the rules of the IRA, so as to be able to fully utilize available subsidies while working alongside CATL despite the obvious conflict of interest regarding Chinese ownership. Companies do not go through this level of effort without reason, and Ford would not have chosen to go through CATL if it did not have to in order to access LFP manufacturing methods and the subsequent cost-savings.”

Living in a country which is basically funded by the mining industry, I am well aware of the scaling up of the global miners, like BHP, Hancock, and Fortescue Metals. Australia has become one of the largest exporters of lithium in the world. Australia’s lithium is in a hard rock form — spodumene — which suits a shift towards LFP battery chemistries.

“The main determinant of lithium pricing for the next decade will be the rate of lithium-ion battery manufacturing expansion and will continue to be inextricably linked to Chinese production levels.”

Copper’s main use is in charging infrastructure. Faster, more abundant chargers lessen the need for larger batteries. This will move battery demand toward cheaper chemistries such as LFP and LMFP. Global supply of copper is increasing at about 3% per year in line with demand. Demand is set to increase since copper is a key component of the transition to renewables — EV powertrain components, EV charging stations, grid support, and transmission lines for renewable energy.

Cobalt has long been associated with child mining in the Democratic Republic of Congo, and many detractors of EVs have used this argument to dissuade the public from buying an EV. Rethink Energy highlights that alternative supplies of cobalt are now available.

Indonesia has increased its cobalt output as a byproduct of its nickel mining to become the 2nd largest producer of cobalt in the world after the DRC. Australia is the third largest producer. Cobalt origin and supply is becoming less relevant as battery manufacturers are continuing to move away from cobalt in their chemistries.

The use of high-nickel cathodes have increased demand for nickel within battery manufacturing. Nickel demand for passenger EVs is expected to increase 550% the next 10 years, almost entirely due to demand for NMC vehicles from the North American market. China and Europe, though, are adopting some no-nickel chemistries as a partial solution. The ramp-up of LMFP cathode production in China makes it difficult to predict demand for manganese. CATL will replace LFP with LMFP cathodes later this year. “LMFP batteries are expected to have a 15% to 20% higher energy density than LFP batteries while only being 5% to 10% more expensive. They also retain capacity better in low temperature environments which would mitigate the potential geographical limitations of LFP batteries.”

Phosphate, primarily used in the fertilizer industry, is also used to produce LFP cathode

materials. In 2021, China produced 85 million metric tons annually, Morocco 38 million metric tons, and the USA 22 million tons. Battery production may compete with food production for the use of phosphate. There is potential for this to increase food prices. Australia has relatively large reserves of phosphate at 1.1 billion metric tons. 90% of Australian phosphate deposits sit in the Georgina Basin, spanning Queensland and the Northern Territory. Most goes un-mined, however. In 2020, Australia's mines produced 2.7 million metric tons of rock phosphate.

Some innovations may have significant effects on the demand for **key battery raw materials** in the midterm. For example: by 2027, solid-state batteries should enter mass production but should not affect the market until after 2030; sodium-ion batteries are expected to be mass produced this year, but this immature technology is not yet economical nor energy dense enough to compete; and recycling will scale up. Although vitally important in the [EV](#) ecosystem in the longer term, for it to make an impact, there have to be enough batteries to recycle. Newer battery technologies enjoy a longer lifecycle and have less valuable components. The recycling process is controlled by contracts with the original EV supplier.

“There are tons of detractors taking to social media platforms suggesting that [raw materials](#) mining just simply cannot keep up with demand and that this fact alone will see the EV market fall flat on its face,” asserts Rethink Energy. Their latest report comes to the conclusion that this is not the case.

Source: Clean Technica