

IN FOCUS: BATTERY RECYCLING

Q&A: Altilium targets circular battery recycling

A battery metal glut has weighed on prices over the past year and raised questions about the viability of some battery recycling projects. Argus spoke with Christian Marston, chief operating officer at Altilium, a recycler and cathode active material (CAM) producer in the UK, about why recycling remains viable, even with low battery material prices. Edited highlights follow:

Where does Altilium fit within the UK battery supply chain?

We're approaching the UK as the only company with a full battery circularity model. We will collect end-of-life batteries using no carbon on electric trucks, they will be transported to a battery recycling station where we will create black mass and then that will go to our Teesside chemical refinery to recover the battery-grade precursors and then we go to CAM production.

We're looking at a solution where we provide battery-ready raw materials to put back into a supply chain, which is 20pc lower-cost than virgin mining and 50pc lower carbon. Also, we expect the concept of a green premium because we have the regulatory environment that requires batteries to be built with a minimum recycled content of lithium, nickel and cobalt.

If we really step back, what we're looking to do with Altilium is give the UK a domestic low-carbon sustainable source of cathode and anode material.

What recycling process do you use?

We're innovating and developing IP for each part of the battery supply chain. For example, we have a programme where we're looking to transport batteries with zero carbon... our

focus is just to get the lowest-carbon CAM back into the supply chain. Even the transport of batteries can be 5-10pc of the carbon. We're innovating at the battery recycling station in terms of automation, how we shred batteries.

If we look at Hydromet, we have the EcoCathode process. In the US at the moment, there are problems with sodium sulphate as a waste stream. We will have a 60pc lower sodium sulphate stream. We're even doing work on bio-leaching to combine that with traditional leaching to get the carbon down in the final raw materials. So there are a number of innovations that we've patented under our Hydromet process.

Another key area is around graphite. We're thinking around full anode circularity and we're working with a European graphite producer. I think graphite becomes important in the payable as well. Some people talk about some of the challenges around LFP, but one of the approaches of being able to recycle LFP is to get a good payable in the graphite.

You're planning a 50,000 t/yr CAM plant in Teesside – how will you access the feedstock needed there?

Altilium is going to commission its own shredding capacity this year. This will enable us to ensure a high-quality material is running through as a feed into our refining facilities. We're in discussions with several other black mass suppliers as well. You're seeing capacities coming online with around 5,000-9,000t of input coming up within the UK and Europe.

So we're quite comfortable around the feed aspect, looking at the end-of-life batteries, batteries that are coming offline from accidents or out of warranty, and also that battery manufacturing scrap as well. On top of that, we're coming from a commodity trade industry background ourselves. We're able to source material – whether it's from India, the

Additional battery feedstocks					
	Unit	Date	Low	High	±
Phosphoric acid					
Cfr India quarter	\$/t	22 Feb		968	nc
Sulphuric acid					
Cfr China contract	\$/t	22 Feb	29.75	34.83	nc
Fob China spot	\$/t	22 Feb	10.00	16.00	+1.00
Caustic soda					
50pc China domestic week 1	Yn/dmt	23 Feb	2570	2730	+265.0
Anode grade petroleum coke					
China fob anode grade green 2.0% sulphur month	\$/t	na	na	na	na
China fob anode grade green 3.0% sulphur month	\$/t	na	na	na	na
China fob anode grade calcined 3.0% sulphur month	\$/t	7 Feb	320.00	370.00	+10.000

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far east. So if it's necessary to go beyond UK borders, we have that network.

How does the current trend in battery material prices affect your business outlook?

This is my personal view – the lithium price was artificially high. If we look at battery recycling, we've adjusted our financial models to take into account the current market pricing and it still works at scale.

At the moment, we haven't priced in a green premium to any of our models. We do see that later this decade, certainly with the regulatory requirement for a domestic non-Chinese supply chain with 50pc lower carbon, there will be a premium in the future.

I think a lot of the projects in the west are going to find it very difficult to compete with nickel from Indonesia, for example, or a Chinese supply chain. It's very hard to de-couple. But I think in the future we will see that we can differentiate ourselves on carbon, although maybe not on price.

In answer to your question, we've adjusted all our models around the changes in price and we're still confident that there's a viable business.

How do you see battery recycling affecting the primary market towards the end of the decade?

By 2040, in the UK or globally, we see that 50pc of the lithium will come from recycling – it won't be from mining, there'll be enough scrap in the system. Let's say nickel and cobalt – over 50pc also coming from recycling. By 2030, we're probably at 10-15pc of raw materials required for the EV battery supply chain.

We acknowledge that there needs to be a lot of mining between now and then, but we think that mining needs to be done with good ESG and powered by renewable energy.

There are a lot of regulatory tailwinds, for example minimum recycled content. If you look in the UK, the automotive OEMs are supplying approximately 50pc of their cars to Europe, so they're bound by those minimum recycled content regulations.

By *Thomas Kavanagh*

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