



Primed for growth

BY MICHAEL ROBERTS

Riding in the slipstream of the battery metals revolution, graphite demand has been tipped to go through a rapid period of growth in the coming decade.

Expected to be the most widely used metal in the anodes of almost all new batteries over the next 30 years, it turns out the ore has many uses beyond the humble pencil.

According to a report put together by the Western Australian Department of Mines, Industry, Regulation and Safety, lithium-ion batteries require 10 to 20 times more graphite than lithium carbonate.

Add to this equation ongoing developments in ore refinement and the commodity's growing impact starts to make sense.

Discovered in 2004 by two British scientists, graphene, a substance derived from graphite, is an atomically thin, crystalline carbon touted as a 'wonder material'.

At one atom thick, graphene is 200 times stronger than steel, more conductive than copper, 50-100 times more efficient than conventional solar panels and has the potential to make aircraft 70 per cent lighter and charge batteries 10 times faster.

So why haven't we heard more about this advanced material and why is it yet to be made on a commercial scale?

The main issues are around cost and volume - it's very difficult and expensive to make large quantities.

That may change in the near future, however, with miners



Mark Thompson.

such as Talga Resources working towards making mass production cost affective.

"I think we are sitting in the box seat," Talga Resources Founder and Managing Director Mark Thompson said.

"Talga is entirely created around the concept of becoming the largest and lowest-cost producer of graphene in the world."

These batteries are performing at 50 per cent higher capacity; some of them charge incredibly fast. We made one battery that charges from zero to 100 per cent in three minutes.

"The commercialisation of the product can only happen when the volumes and the price match inputs that are common to other materials."

Mine to market operation

With a collection of deposits in Sweden, Talga owns and mines some of the highest-grade graphite in the world to feed its supply chain.

The miner aims to be a mine-to-market operation, not only producing graphene, but involving itself in a range of value-add options further downstream.

"We've been using graphene in coating, in concrete, in plastics, but also in batteries," Mr Thompson said.

"These batteries are performing at 50 per cent higher capacity; some of them charge incredibly fast. We made one battery that charges from zero to 100 per cent in three minutes.

"Imagine you could charge your car in the same time it would take to fill up with fuel."

Mr Thompson said Talga had successfully added graphene to concrete to make it a conductive material with game-changing attributes.

"The conductive concrete could, theoretically, wirelessly charge a vehicle while it's driving," he said. "We have shown that it can melt ice and snow."

"This is of great interest in the Northern Hemisphere because it removes the chemicals and salt people currently use to do the same job.

"You could charge cars or buses along the road while they drive. You could charge cars while they wait at traffic lights.

"You couldn't have done that with graphite because it would make the concrete too weak, whereas with graphene you only need to trickle in a small amount and it can give you that effect."

Originally, Mr Thompson planned to develop gold and iron ore mines in Australia, but instead was grabbed by graphite's immense value-add potential.

Moving into the graphite scene in late 2011, when very few companies were interested in the metal, Talga is now producing graphene for the likes of Bosch and HeidelbergCement.

"This is validation that the material we use is special and significant," Mr Thompson said.

"Graphene is finding markets now, and while we would like the testing of these products to go faster than they are, that's life. The creation of new products takes time.

"It's at the start of the river - a small stream at the moment - but it's just getting wider as we go. We are very excited about 2019." **NMC**

