Talga: Seeking growth from graphite, Eureka Report, 8 May 2015

I do these CEO interviews simply to introduce you to interesting ideas, and this week's is a ripper.

Talga started out as an explorer with some gold near Marble Bar. It floated in 2010, but two years later its CEO and 10 per cent shareholder Mark Thompson didn't like what he was seeing in the gold market, and commodities generally, and he was dead right. So he went looking for something else and came up with five deposits of graphite in north Sweden – about as far from Marble Bar as it's possible to get (especially in temperature).

Now Talga is building a pilot plant in Germany to make graphene, the wonder substance that everyone's talking about and which sells for thousands of dollars per kilogram, if you can get it. Thompson says Talga's graphite is such that it can produce graphene in bulk quantities and at much cheaper pries – in other words that he can transform the graphene market.

A scoping study on the resource last year conservatively estimated the pre-tax net present value at $490 million. The current market cap of Talga is $60 million (share price is 43c).

As always I haven't done enough work on the stock to know whether it's a buy or not, but I certainly think it's interesting. And by the way, thanks to subscriber Andy Bellingen for the suggestion.

You can watch the interview here: http://ow.ly/MPE27

Transcript

Alan Kohler: Well Mark Thompson, welcome to Eureka Report. Thanks for joining us.
Mark Thompson: Thanks, Alan.
AK: Now, you floated Talga Resources, I think, in 2010. It was a gold company. You had a few deposits, but the main one was up near Marble Bar. Is that right?
MT: That's right. That was my traditional hunting ground and that's what we formed the company on in 2010 when we listed on the ASX. After a couple of years, though, we weren't really seeing the growth that we wanted and on the back of looking at the first lithium ion batteries being sort of cut open and seeing how much graphite they had in them, I actually took the company towards the graphite space by doing a worldwide review that led me to Sweden.
AK: What made you do that? What made you think of graphite, apart from the batteries thing?
MT: Well, I guess when I looked at the entire commodity space, what's happening now is pretty much what I was concerned about. It was that things had been hot for a long time and

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that there was going to be a time of downwards pressure on commodity prices. All through the 1990s, which I remember very well, there was a lot of downwards pressure. And there's a lot of recycling going on and there's a lot of supply, so what I considered important was a mineral, some sort of commodity that would have new applications to form new markets and that would provide a counter effect to that -- that you would have new applications for a commodity and that would provide this growth in that sector.
And graphite had that; it was a pretty boring sort of hundred-year-old dinosaur of a commodity that no one cared about, but I could see from what was happening in the energy mobility space that graphite was having a whole heap of new applications and therefore would grow pretty well and that's turned out to be the case.

AK: So what brought you to Sweden to see those deposits?
MT: It was actually a true design. I commissioned a worldwide review of graphite projects and of different grades and the highest grade deposit that was an outcropping, an open cut minable deposit, which would make it cheaper to develop, was in north Sweden.
So I approached the company that owned it, which was Teck Cominco – they were one of the top 10 mining companies in the world at that point – and did a deal to buy all of their Swedish assets, and within 12 months we were the world's highest grade graphite resource and had an additional about a quarter of a billion tonnes of iron ore and some cobalt gold projects as well. So we ended up with a graphite deposit that we could bring in towards production very quickly. That was the main driver.

AK: Gee, it's a long way from Marble Bar to north Sweden.
MT: It is. The first day I visited it was about minus 40 degrees actually in the middle of winter which was interesting, but I was also encouraged by the fact that you could get around in the middle of winter and in fact there are open cut mines all around us; it's a mining district and you can mine all year round and it's actually a fantastic place to operate.
The corporate tax rate is about 22 per cent and the minerals tax royalty is only 0.2 per cent. Electricity is very cheap. We've got a network of roads and rail adjacent to the project. So actually economically it was just so compelling that even though it's a long way away, we had to go there.

AK: But, you know, you've got your mines in Queensland and you're building a pilot plant in Germany, which we'll get on to in a moment, does it really make sense to have an Australian-listed company based in Perth to do all this?
MT: Well, yeah, it's true that we listed on the ASX and that that was our start point. We're currently also trading in Frankfurt in Germany. The mines will be in Sweden and the pilot plant is in Germany, but in future the material could travel anywhere and be involved in any market.
The ASX is still a reasonable pricing to operate in, but we hope to grow large enough to look at access to other jurisdictions for listings in future, but it's not a priority at this stage; we keep it lean and mean and so still operating from here and transporting from here is a lot easier than making the wholesale shift at this point. Over the next one to two years we'll review that.

AK: So tell us about graphene. When you bought the deposits in Queensland, were you on about graphene then or was it just graphite?
MT: When we bought the deposits in Sweden, we knew that the graphite was quite special, that it was quite different in the way it worked compared to most things.
I've got a little demo of it here. For example, synthetic graphite, which is nearly a pure type of graphite -- what we realised even just visually was that our rock (this is a drill core from our Swedish project) looked almost exactly the same.

And we did this little trick when we took someone to site that we actually run an electric current through the rock which is actually very, very hard to do. You can do it yourself. If you take a battery out in to the wild and try and run an electric current through a rock, you can't normally do that.

So we knew that we had a type of graphite ore that was quite unique in the world and that gave us an idea about processing that led to a real breakthrough in that we can process our ore without crushing or grinding and many of the expensive steps that most graphite projects have to undergo to get to a graphite graphene product.

The big surprise was that the graphene that was produced was very high quality, quite large for sizes, very thin layers -- one to three layers -- and suitable for a whole range of applications from carbon fibre and plastics to replacing zinc in paints, for example.

So there were a lot of high technology as well as low technology applications for this graphene, but the graphene is extremely expensive compared to graphite. So we were able to access a market where we can get $55,000 a tonne instead of $500 or $1000 a tonne and that really added some cream on top of what was already a good project and worked on normal graphite.

AK: But everyone knows, and it's been clear for a while, that graphene is a pretty interesting product with quite a few great uses for it, but the problem has been producing it in large commercial quantities. Are you saying that you've cracked that, and that you're kind of at the head or at the lead of producing graphene in commercial quantities?
MT: That's correct. We've been identified by groups like Manchester University out of all the graphene producers in the world as number one in its potential for volume. We have an almost endless scale size project for turning in to the graphene component and based on our economic study we released at the end of last year, our pricing so far is probably down towards the lower end of graphene for anyone to produce.
So essentially we remove the cost and the volume barriers at the same time for graphene and that's what's been holding the applications back. So graphene is a wonder material; it does work in a wonderful way, but everyone has been making research quantities from universities and the commercial providers are only just getting going and the quantities are still small, like up to 30 tonnes per year.

In our economic study we're producing a thousand tonnes per year and in fact we've identified markets that need several hundred per cent of that scale to be used. So by dropping the scale and dropping the volume problem, then all the applications can now

come in to being. And actually, to be honest, I would say that in the media exposure of graphene, which focusses on more the high tech uses, there are actually a lot of uses that are much more commercial than people think.

For example, you've got sporting goods like tennis racquets and bike helmets, bike wheels, tyres currently available for sale today, but in the next couple of years… We've seen very advanced products, including fuel cells. There are paints for sale right now, but there'll be specialised paints and electric coatings. We've seen conductive tags that are used, for example, on some Johnny Walker blue bottles to tell if they've actually been opened or not and what the height of the liquid is in the bottle.

There are a lot of commercial applications that are actually being built right now and they're not really showing up that much, but I would say that commercialisation of graphene now that we can supply the volume and at the right price for these materials is actually underway. I wouldn't say it's imminent; I would say it's already underway.

AK: Well, why don't you just go back a bit and tell us what it is about graphene that makes it so useful in all these things?
MT: Sure. So, if we start with graphite which is a form of crystalline carbon which is a layered product, so it's built of many layers. There are three million layers; a single millimetre of graphite contains three million layers of graphene. So it's true that graphene is actually everywhere that crystalline carbon is. If you remove all of the layers to get down to a single atom, you have pure graphene. But doing that is actually very, very hard, a single atom thick layer. When you do get down to that thickness of layer, graphene has strange properties that are totally unlike graphite. The conductivity goes through the roof and the strength in pulling the material goes through the roof as well. So when you pull it, it's actually stronger than a diamond. It's the lightest, strongest, most conductive material at room temperature on earth and it was only really discovered…
AK: Are you saying that that applies when it's one atom thick or do you re-layer it to produce a product that you can actually see and hold?
MT: Right. So what we're talking about is the graphene in its purest, most technical sense. In an industrial sense, actually, between one and 20 atoms thick is useful. By having multiple layers you get most of the conductivity and strength properties, but you also provide bonding sites for other chemicals to hang on to the graphene.
The graphene is very strong, but if you've just got a single sheet, it's actually got no areas for anything to bond to. It's like a table covered with grease; things just slip off it. So by actually making the surface rough with multiple layers, then things can grab on to it and you can mix it in to plastics, in to carbon fibre composites, for example. So in industrial terms, the way to use it is to produce around three to five layer material, which is ideal for mixing in to a whole range of products and three to five layers has got conductivity and strength far beyond that of anything that's graphite, but it's not quite pure graphene; it has an extraordinary effect on whatever you mix it in with. It adds its strength to things like concrete, plastics, glass, paint, for example.

AK: So you mix it in. You don't use it on its own. You mix it in with other stuff.

MT: Correct. It's actually the ultimate additive. You can add a small amount. When I say a small amount, I'm talking about 0.2 per cent, maybe as much as two per cent in some materials. If you mix it… 2 per cent in to a plastic like an acrylic, it can double the Young's modulus, which is a measurement of strength.
So you're talking about doubling the strength of plastics with the addition of only 2 per cent graphene in to it. And you can increase the strength of concrete by about 50 per cent with the addition of less than half a per cent of graphene. So, sorry for all the percentages, but we're talking about extremely small amounts of graphene have got an exponential effect on the strength of all sorts of everyday products. So the bulk of volume application for graphene is not the computer chips and the little transistors and trying to make transparent electric flying planes, it's actually mixing it in to a lot of common everyday products and making them stronger and or conduct electricity. For example, like Lego bricks.

AK: What, sorry?
MT: Lego. Lego is currently investigating graphene in plastic for making the plastic tougher, but more importantly a lot of people are 3D printing, they're scanning and 3D printing Lego kits and file-sharing those. One of the issues with 3D printing is that you want to do it at home, you want to create something at home you'd normally have to buy in a shop. If you've got something that uses a battery, for example, you would 3D print your product, but then you would have to go to a shop and get electric wires to connect up a battery and make something happen, like a Lego robot, for example. With graphene you can have a graphene-rich plastic – in other words, a graphene 3D printing ink – and by squirting a small dot while you're printing the layers of plastic, by squirting a small graphene-rich portion, you get essentially a wire built in three dimensions. The graphene makes the plastic conductive, so now you can put a battery directly in to your 3D-printed object and it will work. This includes 3D printing houses and pretty much anything that's in the 3D printing realm. So the graphene makes it tougher and can make an electric wiring built in to the actual plastic formation itself.
AK: So tell us about how the graphene market looks. How does it look at the moment? What's the price of graphene? Is there a market and how do you think it's going to develop?
MT: Yeah. We believe there's about somewhere in the region of a 160 individual graphene manufacturers worldwide, which includes mostly universities that are producing it for research purposes or trying to sell it.
Large companies like Sigma-Aldrich currently sell it. There's actually quite a lot of graphene for sale online and through various companies, as I said, in the tens of tonnes range. World production, we suspect, including China, is probably around the 500 tonne mark and growing very fast. You've got CAGRs of up around 75 per cent by some people's calculations.

However, the price for that material is extremely high. Some retail pricing is around $100,000 a kilo which translates to $100 million a tonne, so obviously if you want to put some material in your concrete or plastic, markets that require hundreds of millions of tonnes of material, then that price is too high.

You're talking about it has to come down towards $50 a kilo which not many companies in the world can do. In fact currently we're possibly the only one that can get down into that

range and still have immense margins on our cost of production. So I think that the graphene market… it's fair to say well, what is the graphene market? The market is everything that graphene can be used for, but it hasn't existed yet because no one has been providing enough material at a low enough price and that, I think, is the breakthrough that's been happening in the last 12 months, which is being led by Talga.

AK: So you're the disruptor of this market, are you?
MT: We are. We just got back from a conference in Berlin and found ourselves to be quite the talk of the town. 'These are the guys that are claiming to be able to make huge quantities, but what is anyone going to use it for?' The large companies we're talking to, companies with $50 billion to $100 billion a year revenues, have got products that they've already tested and patented, in some cases, applications using graphene two or three years ago.
They've been looking for suppliers that can provide a lot of material very cheaply and that's where we come in, but the difference is cheap for graphene is extremely expensive for graphite. So with the production costs that Talga has down around the bottom quartile of production in graphite, that is the pricing we use then to sell at a graphene price. So it really is a super power booster to our margins, but also, to be clear, the graphite we produce actually pays for production, so in a way our graphene is a free by product and the mine operates profitably as a graphite producer. So graphene for us is an added benefit to what is already a robust graphite economic model.

AK: An added benefit that sells for $100,000 a kilo. Goodness gracious.
MT: Well yeah, that's the competitors' pricing. We spoke to a large group recently in a part of the world and we asked them what sort of price range they needed to enable thousands of tonnes of actual graphene demand for their products and they were saying in the region of, if we could get it down under $80 a kilo. We use $55 a kilo in our scoping study released last year, so Talga feels very confident about playing in this market.
It's not such a big risk for us because we also produce 40,000 tonnes a year of graphite, which is a useful material anyway and is a really good market and is a current market, so the graphene is an extra benefit, but also our capex is very, very low. The capital requirements to build our plant is in the region of just under $30 million, so that's actually pretty cheap for a publicly listed mining company and the pathway to there is actually filled with us proving up our production model from the pilot plant. So yeah, our risk profile on developing the graphene market is lower than for others.

AK: So tell us about the pilot plant you're building. What are you hoping to achieve from that?
MT: Well, it's true to say that our processing methodology is different. It's a bit of a world first, as far as we can tell. We've put together research teams. The number one and number three material chemists in Germany are working on our products right now. And we're very happy, we've scaled up from a laboratory to a benchtop scale and we need to go to a pilot plant scale to develop the technology for two to three years' time when we need to build the full scale plant.
So we're building a pilot plant in Germany very close to our universities. It's former East Germany. It's in an area near where what they call Silicon Saxony, so it's Germany's version of

Silicon Valley. It's an area full of technology, very smart people, very high education, but also a high amount of EU funding and local government funding. There's up to 35 per cent cash back available essentially for equipment spend and up to 80 per cent available in R&D grants in that area.

So for a very, very small amount of investment, we can set up a pilot plant that scales up our technology of the processing. It'll prove all the details that we need for full scale production and, more importantly, it provides large samples of graphene. We're talking between 100 to 200 tonnes of graphene per annum can actually come from the pilot plant and be available or industry to do larger scale experiments and start building those volume markets that we are working with them currently on a small scale. So even at a pilot plant scale, while we're testing this, we actually become the largest graphene producer in Europe, if not the world.

AK: And how much will the full scale plant cost you and will you be able to do it yourself?
MT: Yeah. Right now, okay, so the company financially right now has got just under $7 million. So we're fully funded for everything we want to do regarding building the pilot plant and developing things towards full scale development. Full scale development is $29 million. That's in two to three years' time. And we understand that we have lots and lots of options for how to fund that, as we go, down the road.
Finance in Europe, in the eurozone is actually surprisingly cheap right now, so there's going to be lots and lots of options for funding something that is not a big capital event there. The pilot plant we budgeted about $1 million for and so, as I said, we've got more than enough to get that in to production. We have got environmental approval for mining a bulk sample, which will provide material to the pilot plant. That starts next month and we'll be mining and essentially processing in the next two to three months on a pretty significant scale.

AK: How tightly are the shares held?
MT: There are just under 140 million shares on issue on the ASX and there are between seven million and eight million listed options. Shares are trading at about 42 cents, 43 cents at the moment, giving us a market capitalisation of only about $55 million, so we're still a micro cap in that way.
A lot of our commercial and corporate success is in front of us I think. The shares probably the top 20 hold about 50 per cent. I'm the largest shareholder. I'm a founder. Number two is a guy called Warwick Grigor out of Sydney that you might have come across in the mining game, very experienced. And we've also got some other people on board, like Mark Creasy, John Bond and some funds and institutions as well. So the top 20 is fairly tightly held and then we've got about 1300 retail shareholders.

AK: And how much do you own?
MT: I have just over 10 per cent.
AK: So give us a sense, you know, without being specific and all that stuff, give us a sense of what you think the business is worth in two or three years' time if you go to full scale production as you expect?
MT: Well look, I've got many choices about what I'd do in life, Alan, and this is something that's very exciting for a whole lot of reasons. The net present value that was calculated in the

scoping study on a very small amount of our production -- only 1000 tonnes of 47,000 tonnes actually being sold as graphene -- gave us a net present value of just under half a billion dollars using very, very conservative other metrics. So from where we are now, that's roughly 10 times our current value and that was, as I said, using very conservative metrics. From the large companies I've just come back from talking to in Europe, I can easily see that by the time we get to that point we can convert more of our graphite-type material into graphene-like material and expand on those revenues materially.

AK: Who did that scoping study?

MT: It was a co-effort from some mining analysts, the metallurgists, Independent Metallurgical Operations and Snowden, which is one of the world's leading geological consultants.

AK: And we can find that on your website.

MT: Yeah. I think it was published in November last year, so not that long ago, about six months ago. A lot changes pretty fast with Talga. We only discovered our ability to make graphene from the ore in this way about 12 months ago and to be at the point here now where it's very imminent that we'll announce the final site where we choose for the pilot plant to operate from in Germany and to start mining.

To go from mining and actually processing within 12 to 18 months of discovering what you can do with this material and producing graphene in this way, you know, I think is a great achievement, not only to our team, our very fast growing team, but you know I think is a great sign of Aussie innovation that even though we operate in these eurozone countries, a lot of the original ideas and a lot of the build up to this has been created here in Australia.

AK: That's a good note to finish on and it's been great talking to you, Mark. Thanks very much.

MT: Thanks, Alan. Any time. Cheers.