

Properties are 100% owned

Stephen Riddle: What Investors Really Need to Know About Graphite¹

Monday November 24, 2014, 3:20pm PST

By [Charlotte McLeod^{2,3}](#) - Exclusive to [Graphite Investing News⁴](#)

5

The graphite space is different in many ways from the better-known precious and base metals sectors, and as such can prove confusing for investors to navigate. However, with graphite exploration booming, many nevertheless want to get involved.



With that in mind, Graphite Investing News (GIN) contacted Stephen Riddle, CEO of privately owned Asbury Carbons, which for over a century has supplied carbon and graphite products for a variety of industrial applications. He was able to answer a number of common questions about graphite, graphite companies and supply and demand.

Without further ado, here's what he had to say.

GIN: Can you start by explaining what investors need to know about graphite flake size — specifically, how is it measured and what constitutes a “good” size?

SR: I will first define the common industry standards for flake size. They are +35 mesh, or +500 microns, which we refer to as jumbo — typically greater than 80 percent of the flakes are larger than the screen size mentioned. The next sizing is -35 mesh by 50 mesh, or -300 microns by 500 microns. We usually refer to this particle size as large flake. Again, typically 80 percent or greater falling between those two screen sizes.

The next sizing is -50 mesh by 80 mesh, or -150 microns by 300 microns, which we refer to as medium flake. Similarly, 80 percent or greater falls between the two screen sizes. And then the fourth sizing is what we call -80 mesh and finer, or -150 microns and finer, which we refer to as fine flake. With this size it's typically 80 percent or greater passing through or finer than the screen size.

“Good flake size” is a term graphite people use when a graphite deposit or graphite mine is projected to have a high percentage of its total graphite concentrate with flakes greater than 80 mesh — and preferably including some +50 mesh and even possibly some +35 mesh. Those numbers are based on after recovery, so after flotation, because a lot of times during flotation graphite mines break down the flakes in order to get the purity level required by the market.

The investor is most interested in projected flake size after flotation or purification. Do not assume just because a graphite mine has good flake size that the graphite deposit will be a good investment.

GIN: How does purity fit into the mix?

SR: That's pretty simple. The higher the purity of the graphite concentrate, the higher the average realistic FOB mine selling price tends to be. Note, I said realistic selling price. That is defined as the current market price for a similar particle size of natural flake graphite with a similar purity level, less some discounts that new graphite mining companies must offer in order to secure orders for their graphite production.

I have personally yet to see most of the public junior mining companies publish realistic FOB mine selling prices.

GIN: To what extent does graphite type (amorphous, flake, vein⁷) impact flake size and purity?

SR: First let me explain that all three types of graphite come from veins, though there are differences.

Amorphous we prefer to refer to as microcrystalline-type natural graphite. The reason is that it is made up of extremely small, crystal-like particles that do not form crystal faces that are visible to the naked eye. Amorphous-type graphite that is marketable today is found in purity ranges typically between 70 and 90 percent within ore veins — you can't afford to upgrade it if you are to be cost effective.

The flake type, which is the most common type of natural graphite, is found as free flakes within graphite veins and ranges in flake size anywhere from 75 microns to as large as 850 microns. The veins typically have purity levels of anywhere from 1 to 30 percent. However, at times flake deposits have been found with pockets where purity levels go up as high as 60 to 70 percent.

Flake graphite either has to be crushed and then floated if it's in hard ore, or if it's in soft ore you can skip the crushing stage and just do the flotation to try to get the flakes to at least 80 to maybe as high as 98 percent purity before it's marketable. The preferred purity level is 94 to 96 percent.

Finally, the third type, vein type, which we prefer to refer to as crystalline-vein type, currently only comes from Sri Lanka. This graphite has a morphology that ranges from a flake-like particle for the really fine particles, to a needle-like particle shape for the medium particles, to a grainy or lumpy particle shape for the large and jumbo particle sizes. The veins typically have purity levels of 70 to 99+ purity without any upgrading or flotation. However, the veins are extremely small and range between 5 and 150 centimeters wide. All of the crystalline-vein mines are currently underground.

GIN: All that said, you mentioned via email that flake size and purity are not necessarily what investors should be concerned with — really what they should worry about is average realistic selling price per tonne vs. average projected cost to produce a tonne of graphite concentrate. Can you expand?

SR: All or most of the junior graphite companies are wasting a lot of money and not spending money on the most important issue that investors need to address: what is the difference between average realistic selling price per tonne vs. average projected cost to produce a tonne of graphite concentrate?

Junior graphite companies should be spending investors' money on finding ways to reduce projected costs and on finding ways to increase average selling prices. At the same time, they should be using realistic annual capacity volumes that will not oversupply the graphite market and are sellable — based on today's demand, the market is not ready for any graphite mines with much over 25,000 tonnes of annual capacity. The market just has not been growing, and if anything in the last two years it has dwindled a bit. The only growth currently for new and existing graphite mines outside of China is to be able to take market share from the Chinese graphite producers.

GIN: Does that mean all the fuss about Tesla Motors' (NASDAQ:TSLA⁸) graphite requirements have been blown out of proportion?

SR: When it comes to Tesla, first they and their battery partner Panasonic (TSE:6752⁹) have to determine if they want to switch to natural graphite from synthetic¹⁰. It's my understanding that they are using synthetic graphite currently. Yes, we know that natural spherical¹¹ purified graphite is a lower-cost anode material, but what we don't know is if it will meet Tesla's current and future performance criteria.

Then if they do decide to go into using natural graphite as their anode material, will they want to purchase supply from North America, where I project the costs will be substantially higher than what the Chinese costs are today?

GIN: China's supposed to be doing its graphite industry clean up — is that not really affecting operations there?

SR: A little bit, but not in a major way. What we've seen mostly is that there's just been a few of the higher-purity grades where supply is closer to demand, so you've seen some price changes. For the lower purities of below 94, it's gone in the opposite direction. What's also compounded supply issues for less-than-94 purity is we've had some new mines open, and they are adding capacity on the world market for lower-purity carbons.

GIN: What about graphene? Do you see it becoming a significant source of demand for graphite?

SR: First, understand that graphene has two production methods. One is referred to as top down, the other is bottom up. Natural graphite is only used in the top down process. My feeling is graphene is a very unique material and has potential market applications in many different products. We also know a little graphene goes a long way. So do I see significant demand any time soon? No. Do I believe graphene will be a raw material of the future? Yes.

As an investor, I think what you first have to understand is which process of making graphene is preferred for each of the different potential market applications. Second, when do you believe those market applications will realistically come to fruition and require some volumes of graphene?

GIN: Given all those supply/demand factors, how important are offtake agreements for graphite companies to have? Is it possible to succeed without one?

SR: I believe offtake agreements are extremely important for any new graphite mine. That's because natural graphite is not as easy to sell, mine and produce to market requirements as most people envision. It's important that junior mining companies find somebody that really has graphite experience and understands what the requirements of potential customers are and can assist on technical matters related to meeting or exceeding market requirements.

GIN: That's a lot of information to take in. To sum up, what should investors keep in mind when looking at graphite companies? Are there any you feel are doing a good job of telling investors what they really need to know?

SR: No, not really. The problem as I see it is we have a substantial amount of overvalued junior graphite mining companies with no current revenues. The investors, the promoters, the junior mining companies themselves have done a fantastic job of promoting themselves and each other with the net result being that their market caps are way overvalued. The downside of overvalued junior graphite mining companies is that in most cases they are worth more not being in the graphite business than they ever will be worth if they generate graphite revenues and hopefully some profits. So this is a major issue the graphite industry and potential investors have to deal with if investors expect to make a return on their capital.

I think the other big issue is that the investment community has only really looked at the big or mega graphite mines. They've avoided the small graphite mines that can be profitable and are more realistic. This is another major issue we in the graphite industry have to try to change. We need to try to get investors interested in the smaller graphite mines because the big or mega graphite mines require a lot of demand; it isn't here today, which means they will have a very difficult time becoming profitable. I know how a lot of them got started — they started out wanting to produce 20,000 to 25,000 tonnes a year, and they then found out their costs weren't low enough. So then they said, "well, what happens if we produce 50,000 or 80,000 tonnes a year. Oh look, we now can get our costs down to much lower cost per tonne."

Well that's normally true in any business as you create more volume. But then the question is where are you going to sell it all, and are you going to be able to sell it all at market prices — or are you going to have to discount substantially to sell it all? I also believe a low selling price will not sell all the graphite. So even if you did discount it substantially, you're going to have a tough time selling all the volume annually.

The real issue investors must ask is what do junior graphite mining companies project in terms of cash flow? It doesn't necessarily mean larger flakes — yes, larger flakes will have a higher average selling price than finer flakes of the same purity. But if you mine a deposit that only produces fine flakes, but the costs are extremely low, that could be a very good investment.

GIN: What graphite market developments can investors expect as we head into 2015?

SR: That's a good question. With new graphite mines opening up outside of China, and the fact that the market hasn't been really growing lately, I'm going to say that in certain grades, especially the lower-purity grades (less than 93 percent carbon), there's probably going to be a surplus in supply.

In the higher carbon grades (94 to 97 percent purity), the supply will be bit closer to demand due to the fact that the new graphite mines most likely won't be able to produce higher-carbon material — initially, at least.

So you'll probably see more of a decrease in prices in the lower carbon grades and then a holding of prices, or the potential for a small increase in prices, in the higher carbon grades, depending on supply versus demand.

Securities Disclosure: I, Charlotte McLeod, hold no direct investment interest in any company mentioned in this article.

Editorial Disclosure: Interviews conducted by the Investing News Network are edited for clarity. The Investing News Network does not guarantee the accuracy or thoroughness of the information reported. The opinions expressed in these interviews do not reflect the opinions of the Investing News Network and do not constitute investment advice. All readers are encouraged to perform their own due diligence.

Related reading:

[Types of Graphite: Amorphous, Flake and Vein](#)⁷

[What is Synthetic Graphite? Asbury Carbons' Stephen Riddle Explains](#)¹⁰

[Simon Moores on Spherical Graphite and the Benefits of Exploration](#)¹¹

Links

1. <http://graphiteinvestingnews.com/9035-asbury-carbons-stephen-riddle-graphite-china-tesla/>
2. <http://graphiteinvestingnews.com/author/cmcleod/>
3. <https://plus.google.com/u/0/110527547008095216401>
4. <http://graphiteinvestingnews.com>
5. <http://graphiteinvestingnews.com/files/2014/11/question-mark.jpg>
6. <http://graphiteinvestingnews.com/newsletter?ref=post>
7. <http://graphiteinvestingnews.com/1337-types-graphite-amorphous-flake-lump-vein-energizer-focus-northern-syrah-northern/>
8. https://www.google.com/finance?q=NASDAQ%3ATSLA&ei=EqVrVLj_B4OhigKv9oCYCA
9. <https://www.google.com/finance?q=TYO%3A6752&ei=FaVrVMHzGNG1iAKnt4DoBw>
10. <http://graphiteinvestingnews.com/1849-what-is-synthetic-graphite-asbury-carbons-stephen-riddle-explains/>
11. <http://graphiteinvestingnews.com/4531-simon-moores-spherical-graphite-exploration-price-juniors/>
12. <http://graphiteinvestingnews.com/9285-magnis-resources-large-jumbo-flake-graphite-tanzania/>
13. <http://graphiteinvestingnews.com/518-flake-graphite-exploration-quebec-property-lomiko-metals/>
14. <http://graphiteinvestingnews.com/8514-canada-carbon-high-purity-graphite-quebec/>
15. <http://graphiteinvestingnews.com/7563-canada-strategic-metals-graphite-exploration-quebec/>