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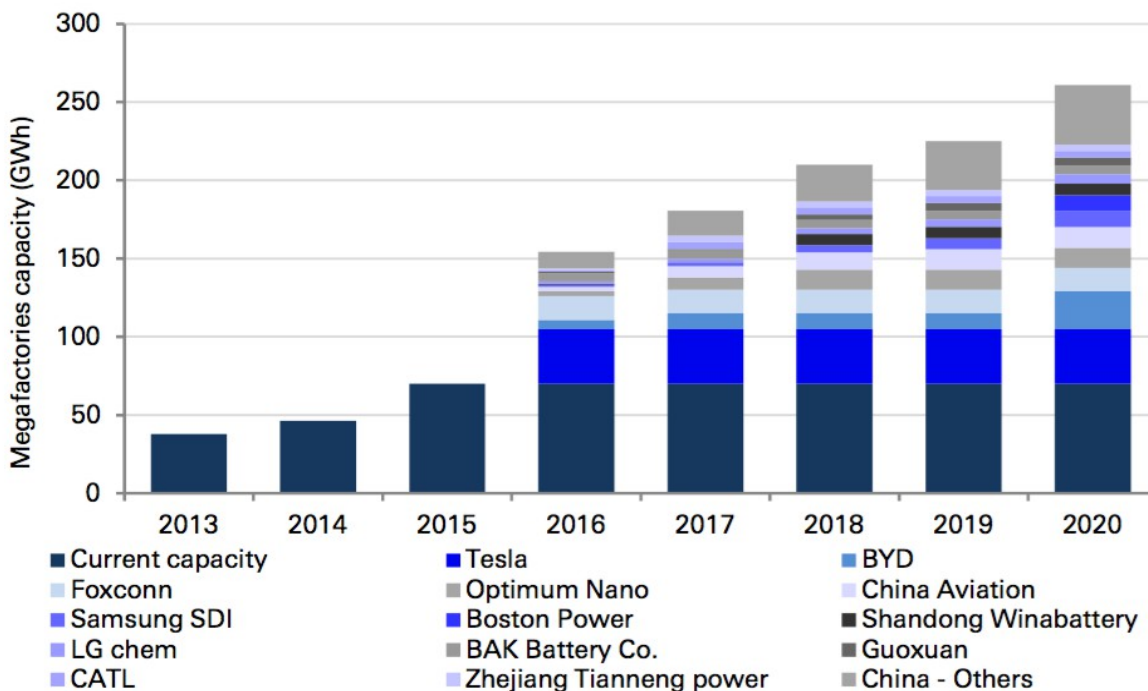
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Know when to hold-em!  
 Know when to fold-em!  
 Know where to set stops!  
 Know when to run!  
 Never count your portfolio  
 Until the sells are done..

### Batteries – Lithium or Graphite – which is it?

As investors we have heard explosive growth stories for Lithium and Graphite from the rising demand for batteries, especially the numerous giga factories planned around the world. There are 12 planned between now and 2020, but most are in Europe and Asia, just two in the U.S., Nevada and Michigan.

Figure 3: The battery supply chain is rapidly increasing



Source: Deutsche Bank, company data

Currently over 60% of the demand for lithium and graphite is industrial use, but it is this anticipation of battery demand that gets all the optimistic forecasts **and it is deserving.**

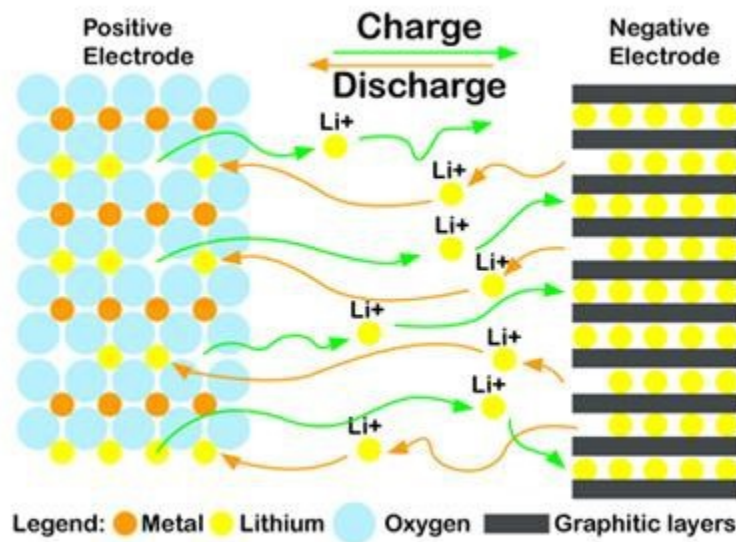
Currently lithium is getting all the attention, but when I crunched all the facts and numbers, it is clear the graphite investor should reap higher rewards.

## First some important battery basics.

They are called lithium ion batteries not because they are filled with lithium, but it is the powerful reaction of lithium and the movement of the lithium ion that provides the power or electricity.

Inside the battery casing there is 3 basic components.

The Cathode that is typically a Lithium Nickel Cobalt Manganese Oxide. NCM for short and a successful combination is 5 parts nickel, 3 parts cobalt and 2 parts manganese.



The anode that is a graphite carbon that facilitates the absorption of lithium ions. Six Graphite atoms can hold 1 lithium atom, think of this as holding a charge.

And 3<sup>rd</sup>, the electrolyte that facilitates the movement of the lithium ion between the cathode and anode.

When a battery is used or discharges - the lithium ions move from the anode (graphite) to the cathode (nickle). When you recharge it, basically you are moving the lithium ions back to the anode.

Elon Musk of Tesla recently commented

***“Our cells should be called Nickel-Graphite, because primarily the cathode is nickel and the anode side is graphite with silicon oxide... [there’s] a little bit of lithium in there, but it’s like the salt on the salad,”*** the CEO explained.

## I believe he was down playing the lithium more than warranted.

Musk said that the amount of lithium in a lithium ion battery is about 2% of its total volume. Volume is probably not a good metric because lithium, graphite and nickle are all sold by weight, tons or pounds.

There is actually more nickle and cobalt in these batteries than lithium. Nickle is priced higher than graphite about \$10,000 per ton and half the cobalt reserves are in a precarious place, The Congo. For this report I am going to focus on the lithium and graphite.

## Lithium

Lithium is highly reactive and its ions are bursting to get on the move. I can remember back in Chemistry class, that lithium only had to be exposed to water and would start an explosive reaction immediately.



This is why you have heard of battery fires and there are strict guidelines or restrictions on lithium ion battery shipping. It is quite common knowledge on the amount of lithium in a battery because of this. You can refer to some regulations from UPS and their calculation on lithium content.

[https://www.ups.com/media/news/en/shipping\\_batteries.pdf](https://www.ups.com/media/news/en/shipping_batteries.pdf)

In the U.S. — Cells must not exceed 1.5 g of “equivalent lithium content”; — Batteries must not exceed 8 g of “equivalent lithium content.” You may calculate “equivalent lithium content” by multiplying the cell’s ampere-hours by 0.3. Since most small batteries are marked with milliampere-hours, you must first divide milliampere-hours by 1,000 before multiplying the result by 0.3

**Example:** A 2Ah 18650 Li-ion cell has 0.6 grams of lithium content. On a typical 60 Wh laptop battery with 8 cells (4 in series and 2 in parallel), this adds up to 4.8g. To stay under the 8-gram UN limit, the largest battery you can bring on a plane is 96 Wh.

Tesla's Model S 85 KWH battery is made with thousands of small batteries or cells and would have about 6.8 Kg of lithium or 15 pounds, about \$120 worth, based on the above numbers.

Based on some other current EVs there is about 0.15 Kg lithium per 1KWH so the Model S could have 12.75 Kg or about \$225 worth of Lithium.

**Either case, the amount is significant but the cost of lithium is not a big factor.**

With both lithium and graphite, there is lots around and it is plentiful.

Most lithium is mined in South America—Argentina, Bolivia, and Chile. Bolivia especially has large reserves in the Salar de Uyuni, a salt flat so huge and blindingly white, that Neil Armstrong and Buzz Aldrin spied it from the moon. (They thought it a glacier.)

The global reserves of lithium carbonate equivalent—which is the amount that can be economically mined right now—is estimated to be about 75 million metric tons, according to the United States Geological Survey. The actual amount produced each year is very little of this . Analysts at Cormark Securities estimate there were about 175,000 metric tons of lithium carbonate equivalent produced in 2015.

With the increase in Lithium prices a lot of money has come into the sector that is bound to bring on new supply

## **The real issue is ramping up production as demand increases.**

The market is dominated by a few big producers. FMC will produce an additional 4,000 tonnes of lithium hydroxide next year, raising the company's total global capacity to 18,000 tonnes. It did not give details of the electric vehicle manufacturer it struck a deal with. The additional production would be almost enough to supply Tesla's Gigafactory or roughly 500,000 mass-market electric vehicles, according to Aleksey Yefremov, an analyst at Japanese bank Nomura.

However, a point made "The fact that FMC wants to bring incremental capacity on in the near term confirms a tight market for battery grade lithium," Aleksey said.

Australia is the biggest producer, slightly a head of Chile, and production is ramping up down under. <https://www.businessnews.com.au/article/Demand-sparks-WA-lithium-projects>.

There are 16 lithium projects estimated to begin production between 2016 and 2020. The majority of these are hard rock projects, which have the ability to come online relatively quickly (5 years expenditure to production) given their shorter production lead times.

**While there could be some timing issues and a bit of a tight market the next year or two. It is already priced in!!!**

## **Graphite**

Graphite promoters will claim there is twice as much graphite in a battery than lithium. If you go by weight which is the best measurement, it might be more like 1.6 times

A large EV battery requires about 25kg (55 lb) of graphite for the Li-ion anode, which is around twice the 15 to 28 pounds of lithium I calculated. At 28 pounds lithium it is close at 1.9 times more graphite.

**Benchmark Mineral Intelligence** estimates In 2021, based on Tesla manufacturing 150,000 Model 3 units, Benchmark estimates that the company will consume 10,800 tonnes of spherical graphite for its anodes and 7,200 tonnes of lithium hydroxide as a cathode raw material.

<http://benchmarkminerals.com/Blog/tesla-will-need-a-lot-of-graphite-lithium-but-china-will-need-more/>

**That equates to 1.5 times so I would say that 1.5 to 2 times is an accurate number.**

So that in itself is more bullish for graphite, **but there are two larger factors at play.**

Spherical graphite has to be 99.9% pure carbon and go through a refining process to make and as a result, on average half the flake graphite mined is lost in the concentration process. So to make ton of spherical graphite you need about 2 tons of natural graphite produced. **So in essence there is about 3 to 4 times as much graphite required for a battery than lithium.**

With lithium, it currently comes out of the mining process at between 90% to 95% pure, so not much waste to get the purity over 99% but it is an energy intensive and expensive process.

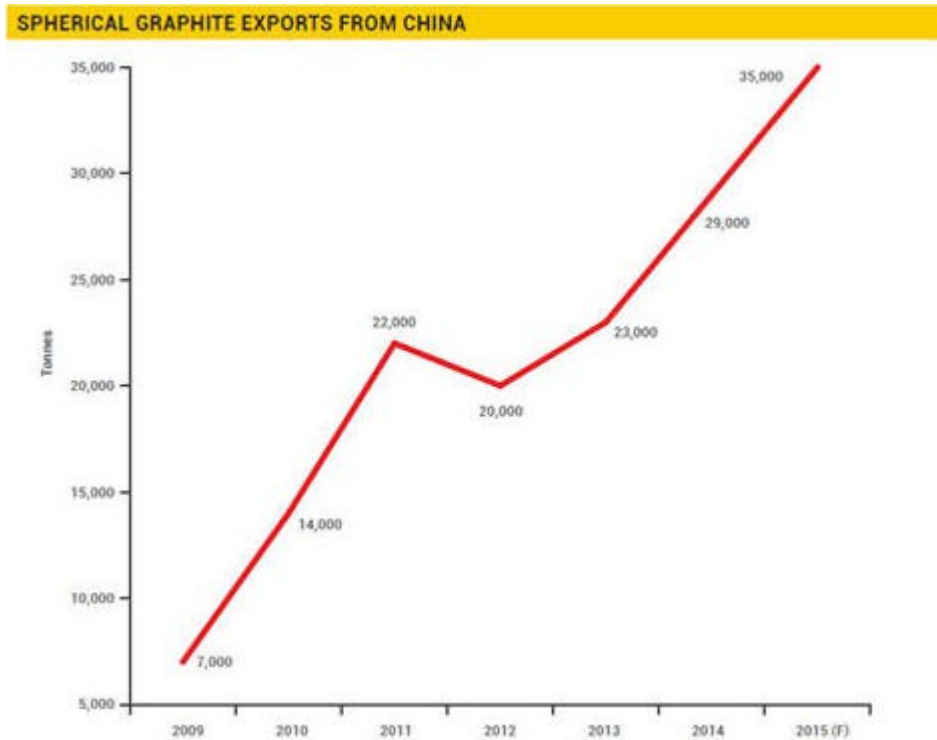
There is currently two sources of carbon for the graphite anode. A synthetic process and spherical graphite derived from flake graphite.

**Spherical at \$3,000 to \$4,000 per ton has a cost advantage over synthetic at \$10,000 per ton**

and spherical is far less energy intensive and more environmentally friendly to produce.

The Benchmark article of April 1 also highlights that **100% of natural spherical graphite is produced in China**, and last year alone production expanded by nearly 50%. Increasing demand has seen prices of uncoated spherical graphite increase by 10% in the last two months.

**Therefore on top of battery demand increasing we are also seeing demand increasing for natural graphite by a further factor because spherical is getting the nod over synthetic and it is believed this is Tesla's preference as well.**



Just these two factors means that demand or amount of **graphite could out pace lithium demand by a factor of 4 to 6 times as it equates to the battery market.**

**Most investors fail to understand or have done the research to uncover these facts.**

*“The main determinants on the cost of the cell are the price of the nickel in the form that we need it... and the cost of the synthetic graphite with silicon oxide coating,”* explained Musk of Tesla.

When you consider that there is more graphite in a lithium ion battery than lithium, the cost of graphite to a battery is more, significant than lithium. Currently the market is just focused on part of the equation and is ignoring graphite – **but currently to our benefit I might add.**

Currently Tesla sources their cells or batteries from Panasonic that uses synthetic and spherical graphite. However there are two important factors here, the trend towards spherical graphite and the fact that graphite contributes more of the cost of a battery than lithium.

**Graphite has not experienced the price spikes that lithium is going through as a result, graphite's supply situation has fallen under the radar.**

There is a couple other factors that could be very bullish for graphite. Lithium supply is diversified around the world with Australia and Chile as the top producers making up about 10% of supply each. Over 70% of graphite production is from China so any policy change their could dramatically move prices up.

And a 4th and very important factor for investors is that the price of lithium stocks have jumped much higher and graphite stocks have been soft or lack luster. **The old mantra that always proves true is buy low and sell high.**

Right now the majority of investors are doing the opposite, buying the lithium stocks high and not buying the graphite stocks low.

There is nothing wrong with owning lithium stocks and with batteries an important aspect of our future you stand to profit.

**However, from what I have uncovered for you here, I believe you should have 4 to 6 times more \$\$ in graphite stocks over lithium.**

\*\*\*\*\* **The Graphite Stocks** \*\*\*\*\*

Most junior graphite companies know the potential of the market and are all trying to position themselves as a supplier of battery grade graphite. That is not their biggest challenge though!

**They are all struggling through the financing, permitting, feasibility and environmental process to build a mine, especially with the current depressed market/ . On top of that they need user or off take agreements as well.**

**This brings me to my two favorite stocks because they have over come most of this and a few others are worth considering as well.**

|                           |                |                      |                              |
|---------------------------|----------------|----------------------|------------------------------|
| <b>Syrah Resources</b>    | <b>ASX:SYR</b> | <b>OTC: SYAAF</b>    | <b>Recent Price \$A 4.21</b> |
| <b>Entry Price \$4.10</b> |                | <b>Opinion - buy</b> |                              |

With the softness in the Graphite market Syrah is back to an attractive buy price again.

As a refresher

Syrah is the 1st company to bring a significant new graphite mine to production, its flagship Balama Project in Mozambique. The Project hosts the largest graphite ore reserves in the world with an Australasian Joint Ore Reserves Committee (JORC 2012) compliant Ore Reserve of 81.4Mt at 16.2% total graphitic carbon (TGC) for 13.1Mt of contained graphite.

A Feasibility Study completed during May 2015 confirmed that the Balama Project will be a first quartile producer due to its high grade, open pit operations which has an extremely low stripping ratio. The processing plant will have a feed rate of 2Mt per annum, and based on an average head grade of approximately 19% TGC over the first 10 years of operations, 356,000 tonnes of graphite concentrate will be produced per annum. This production profile will make Balama the largest producer of graphite globally, and ideally positioned to meet the anticipated increase in demand from lithium ion battery applications, as well as servicing traditional graphite markets.



They are fully financed to build the mine which is already well advanced with 1<sup>st</sup> production expected to start in Q2 2017 and ramp up during 2017. And the financing of A\$ 194 million at \$6.05 per share is well above the current share price

There is numerous photos of the project on their web site here

<http://www.syrahresources.com.au/development-activities>

Balama Project remains on schedule and budget with overall projection completion of 42.6% as at 31 August 2016.

They have a five year Offtake Agreement signed with Marubeni Corporation to purchase a total of 50,000 tonnes of coated and uncoated spherical graphite per annum for major battery and anode customers in Japan and Korea, after extensive due diligence and product evaluation by these customers.

Also

- Off take agreement with Chalico for 80ktpa of flake graphite over 3 years
- Statement of Sales Intent with a major global refractory producer for 15ktpa of flake graphite
- Statement of Sales Intent with Hiller Carbon for 25ktpa to 35ktpa of natural graphite recarburisers

They currently have a spherical graphite pilot plant in China and **Syrah has been considering a plant in the USA but nothing concrete or announced here yet.**

What is of interest is what Syrah puts out as estimates for spherical graphite.

In order to maximize production yields, -100 US mesh natural graphite is the optimal material to use as feed stock in the spherical graphite production process. **Typically, two to three tonnes of feed stock** is required to produce one tonne of spherical graphite.

**Approximately one kilogram of coated spherical graphite is required to produce 1KWh of energy from a Li-ion battery.**

**Syrah is saying over 2 times and up to 3 times feed graphite. Their battery estimate is about 6 times more graphite than lithium. I think this is high but probably means my calculations are conservative!**

Currently it appears they will service a lot of expected demand in Asia which is currently more significant than Europe or North America.

This is a high grade and large mine with low cash costs estimated at US\$286 per ton that will produce very significant cash flows and profits

The stock chart next page shows that we have seen the share price come down to support just around the \$4.00 and that has held. I expect this will hold as support and the stock see considerable appreciation when cash flow and profits commence next year.

It is also back down close to our original buy level



*Syrah believes that further downstream processing of graphite concentrate presents a major potential opportunity to accrue additional value for shareholders !*

**Elcora TSXV:ERA OTC: ECORF FRANKFURT: ELM      Recent Price \$0.31**  
**Entry Price    \$0.13                                      Opinion – buy                      Market Cap    \$22 M**

I left off with the above statement by Syrah, because that is exactly the path of Elcora, a vertically integrated company to be involved in the processing and the much resulting higher margins of finished products. **I am going to spend a bit of time on Elcora because many really don't understand the company, it is lumped in with graphite juniors and it should not be.**

**Elcora is not a mining company but a processor and technology company.**

They have already proven through a reputable 3<sup>rd</sup> party verification that their graphene, derived from graphite is significantly better than anyone else in the industry and they have built the 1<sup>st</sup> graphene production facility in North America. See news release Jan 14, 2016

It has only been commissioned a couple months and is small scale as graphene is still at the R&D stage but I expect we will soon see news on collaboration work with other graphene researchers that currently includes many Universities, Government Agencies and major Tech Companies

While graphite sells for around \$1,000 per ton, graphene sells for \$20 to \$50 per gram, so the margins are many multiples over selling graphite and it only costs Elcora pennies per gram to produce.

Currently the graphene research market is about \$30 to \$50 million per year and Elcora really has no competition in this market. This would be their short term source of cash flow and I expect news on this front in the months ahead.



## Battery Graphite Strategy

On August 24, 2016 Elcora announced the successful initial test results of Elcora’s proprietary graphite processes for lithium ion battery anodes. This is potentially huge news and I will put the news release and technical details in it's entirety and net out what it means for investors

\*\*\*\*\*

The purpose of the tests was to validate Elcora’s processes using grade, size analysis, BET surface area, calendar density and eChemistry.

*“Elcora’s high purity 99+% flake concentrate is significantly above the industry standard of 95-98%. This will have important implications for thermal processing which is the preferred method of purification for long-life automotive cells. Elcora graphite also exhibits a very high level of crystallinity and therefore reversible capacity consistent with the top 20% of graphite materials we have tested from junior graphite companies. The combination of high purity and high reversible capacity could prove to make Elcora a preferred graphite sources for LIB anode materials”,* states Dr. Edward R. Buiel, CEO and President of Coulometrics, LLC.

### Particle size distribution

Elcora has developed a proprietary process to reduce the size of graphite crystals to those best suited for anode production. This process was developed in order to combine different sizes of particles so that anode packing density can be optimized and to minimize the use of spherical graphite. An example of the size distribution of Elcora process graphite is shown in Table 1.

Table 1: Size comparison between grinding energy inputs ranging from the primary grind of 7 kWhr/t to 440 kWhr/tonne

| Power (kWhr/tonne) | 7         | 110       | 220       | 440       |
|--------------------|-----------|-----------|-----------|-----------|
| Fraction Smaller   | Size (µm) | Size (µm) | Size (µm) | Size (µm) |
| 10%                | 90        | 44        | 21        | 16        |
| 25%                | 125       | 86        | 44        | 27        |
| 50%                | 210       | 144       | 86        | 44        |
| 75%                | 310       | 220       | 144       | 70        |
| 90%                | 470       | 330       | 211       | 100       |

### BET surface area

For better anode performance the BET surface area of graphite is minimized. As an example for under 20 micrometer particles the target surface area is between 3-5 m<sup>2</sup>/g. This target is usually met by reducing the surface area through coatings. The Elcora process has achieved and surpassed this target without coatings as shown in Table 2.

Table 2: BET Surface area of Elcora process graphite

| Flake Size Mesh | BET Surface Area (m <sup>2</sup> /g) |
|-----------------|--------------------------------------|
| -120            | 1.10                                 |
| -64             | 1.22                                 |
| -32             | 2.35                                 |
| -20             | 3.20                                 |

### Calendar density

The calendar density is the density of the anode. This characterizes how much graphite can be added to a battery. The target is between 1.5 and 1.8 g cm<sup>-3</sup>. Initial tests, without optimization of the particle size distribution or spheronization, have resulted in Elcora densities as high as 1.46 g/cm<sup>3</sup>.

### Graphite purity

The Elcora process uses multiple steps to produce high purity graphite. The results of both the primary and secondary purification stages are shown in Table 3. The repeatability of the results gives confidence in the results. PIXE, or proton induced x-ray emission tests, are currently being conducted to confirm these results and to accurately determine the contaminants at the ppm level.

Table 3: Graphite assays after purification

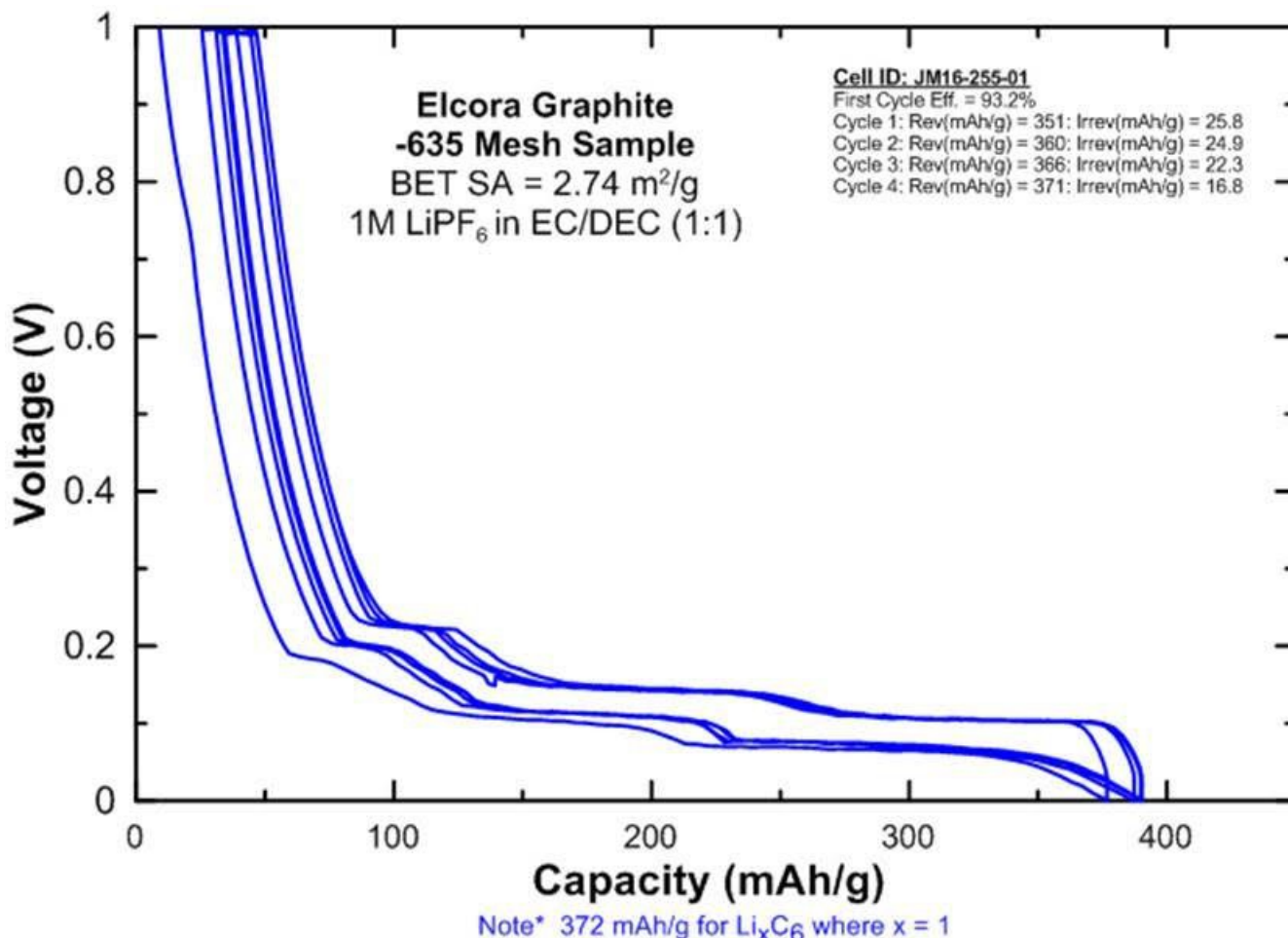
|                              |        |        |         |
|------------------------------|--------|--------|---------|
| Primary stage over all       | 98.80% | 99.13% | 99.10%  |
| 2 <sup>nd</sup> +64 – 128 μm | 99.98% | 99.99% | 99.98%  |
| 2 <sup>nd</sup> +32 – 64 μm  | 99.98% | 99.98% | +99.99% |
| 2 <sup>nd</sup> +20 – 32 μm  | 99.99% | 99.99% | +99.99% |
| 2 <sup>nd</sup> -20 μm       | 99.94% | 99.99% | +99.99% |

### eChem tests

c20 cycling tests were done with Elcora process graphite using different binders, additives, and electrolytes. Examples of battery test using Elcora anodes is shown in Figure 2. In these results, the reversible capacity increased to 371 mAh/g in the first 4 cycles which is very close to the theoretical maximum of 372 mAh/g. The capacity was calculated based on the mass of graphite in the electrode only and does not include the small mass of carbon black that is added to the electrode to maintain conductivity. Notwithstanding, the reversible capacity of the Elcora Graphite is very high and well suited for lithium ion battery applications.

The first cycle efficiency is 93.2%. These results were achieved without spheronization or coating. Most battery manufacturers specify 93-95% first cycle efficiency which must be balanced with cathode materials that do not exceed 95%.

Figure 2: Example of battery cycle tests using Elcora graphite anodes.



Troy Grant, President and CEO: “These results are the next successful step in Elcora’s goal of value-added graphite production which is able to produce cleaner batteries for electric vehicles. These anode and battery test results demonstrate that Elcora’s anodes show excellent potential for use in lithium ion batteries. It further confirms, at the bench scale, Elcora’s vertical integration strategy of value added transformation using our own proprietary process”.

\*\*\*\*\*

**This tells us that Elcora could have a much better solution for the battery anode**, even it is just on par with current spherical graphite it has huge potential for Elcora and this is why:

It was probably missed over the summer doldrums or Investors did not grasp the implication, but in the August 17<sup>th</sup> news release, it says:

The traditional method of graphite preparation for anodes includes spheronization, purification and coatings. The Elcora processes are designed to reduce or eliminate each of these stages with the goal of reducing the carbon and energy footprint of the anodes and to reduce costs.

The company is in the process of **sourcing from several mines** in order to minimize supply risks and to ensure sufficient volume to supply the lithium ion battery anode market and worldwide giga factories. Tests are currently underway with industry experts to prove the technology and to **design a production facility**.

*“This move is part of Elcora’s vertical integration strategy of added value processing to maximize returns to shareholders,”* said Troy Grant, Elcora’s President and CEO.

## **My Summary**

Forget about being a graphite miner, there is lots around and Elcora can just as easily buy the graphite as they can sell it and they already have the ins with industry leading commodity distributor Thyssenkrupp, see February 23<sup>rd</sup> news release.

They have the Sri Lanka mine which is ideal for graphene with battery grade graphite as the by-product and are currently looking to source from other producing mines.

Elcora’s process from testing so far appears to be better and cheaper to the current spherical graphite being used for batteries.

**As I said even if it is just as good, the point is they are working with industry experts to prove and design a production facility.**

Large Flake Graphite sells for \$1,000 per ton and if you are lucky enough for all in costs to be \$500, than you have \$500 margin per ton.

Syrah is going a step further **with a portion** of their production and producing Spherical Graphite and it sells for \$3,000 to \$4,000 per ton, roughly. We don’t know what all their input costs will be yet, but their margin will be a multiple of the \$500 per ton.

Elcora is yet going one step further and is planning to sell the Anodes themselves that go for \$10,000 to \$20,000 per ton.

If Elcora pays \$1,000 per ton for the graphite and as a guess costs to produce their Anode is \$4,000 per ton (using the top of spherical range – even though they claim their process reduces cost) their margins are going to be \$1,000s per ton.

## **Where do you think the most money will be made? And shareholders best rewarded?**

Now some might say this is a tall order and sounds like pie in the sky, but Elcora has the expertise and the brains behind them to pull this off.

Dr Ian Flint a 30 year expert in Graphite processing and Graphene is at the helm. They have Dr. Antonio Castro Neto (known as the Godfather of Graphite) as an Advisor and major shareholder.

The Graphene Research Centre (GRC), at the National University of Singapore (NUS), is the first centre in Asia dedicated to graphene research. NUS established the GRC in 2010, under the leadership of Prof. Antonio H. Castro Neto, with a start-up fund from NUS of \$40 Million. The GRC was established under the scientific advice of two Nobel Laureates in physics – Prof Andre Geim and

Prof Konstantin Novoselov- who won the 2010 Nobel Prize in Physics for their discovery of graphene.

Prof. Antonio H. Castro Neto is colleagues with Nobel price winners Giem and Novoselov. These are the first and brightest minds in graphene. The GRC rated Elcora's graphene best in the world and far above the 2nd place finisher.

They also work with Dr. Edward Buiel, CEO and President of Coulometrics, LLC, who is colleagues with Dr Jeff Dahn at Tesla, some of the brightest minds in lithium ion batteries.

I encourage to watch this presentation video by Ian Flint in the \$\$Lounge on the web site <http://www.playstocks.net/index.php/forum/graphite-stocks/13-elcoa-resources-graphene-corp?start=80>

An important point of verticle integration is controlling the process all the way from the mine to the final product the Anode for batteries, this is very important in the graphite business.

**The fact the stock has come all the way down to it's support zone is really a gift, being handed to you on a graphene platter. Well that is how I see it!!**

We can blame it on the weak graphite market, summer doldrums, lack of understanding of the company, little news out of the Sri Lanka mine and probably most important a mis direction of investors into lithium instead of graphite.

I expect Sri Lanka had your typical mine ramp up quirks, but they just hired a very experienced new mine manager and I look for some good results there now.

The stock is in the support zone and not shown here, RSI and Stochastics also indicate a buy



<http://www.elcoracorp.com>

Here is also a quick update on the top North American graphite juniors I believed can get to production. My last update on these was late spring so some progress since then. **I called these the Turkey Shoot where 2 or 3 of the four (now five) should make it to production**

**Northern Graphite's TSXV; NGC Market Cap 15.5**

NGC is also working with Dr. Edward Buiel of Coulometrics, LLC. NGC also has demonstrated their graphite is excellent for batteries and they have a proprietary coating process. Coating is one of the steps in upgrading graphite mine concentrate to spherical graphite (SPG), the anode material.

NGC needs off take agreements and financing to get their Bisset Creek in production.

**Alabama Graphite CSE:ALP Market Cap \$19.5 M**

Alabama Graphite has manufactured and shipped samples of two specifications of its coated spherical graphite (CSPG) to a long-established, U.S.-based leader in lithium-ion battery production for numerous and varied military applications for the U.S. Department of Defense (DoD).

They have been supplying other samples to entities involved with the DoD. ALP needs further feasibility work, financing and off takes to move ahead.

**Focus Graphite TSXV:FMS Market Cap \$16.3 M**

Focus has demonstrated their graphite can be used for batteries

They have an off take agreement, feasibility and are progressing to the permitting stage. They will require mine financing with a capex of \$165 million it will be a significant hurdle with 155 million shares already outstanding.

**Mason Graphite TSXV:LLG Market Cap \$140 M (includes \$25M financing)**

Has a feasibility for their Lac Gueret project in Quebec and they require more permitting work, off take agreements and mine financing.

Mason has done the best by far. The stock price has doubled since my last update and just over a week ago they announced a \$25 million bought deal financing at \$1.10 per share

Approximately \$17-million for development expenses related to the company's Lac Gueret graphite project and concentrator plant project, the majority of which the company expects to incur over the next 12 months (or approximately \$21-million if the overallotment option is exercised in full); these development expenses represent a portion of the project's estimated \$165.9-million capital expenditure budget,

**Wildcards** - ones I follow with outside chance of developing

**Zenyatta TSXV ZEN Market Cap \$64 M**

ZEN has lump vein graphite like Sri Lanka but low grade at 4%. They have been working with Ballard Power and Israeli firms for applications of their graphite.

ZEN recently completed a \$2.9 million rights offer at \$0.75 per share. In mid August they appointed industry veteran Mara Strazdins as VP of corporate communications and investor relations. I believe that was a factor in moving the stock higher.

They have to do more drilling, a Feasibility, environmental and permitting, off take agreements as well as mine financing. The preliminary PEA indicated a high capex at US\$411 M. more than double of most competitors

### **Energizer Resources TSXV EGZ Market Cap \$32M (includes \$6M financing)**

EGZ closed a non-brokered private-placement offering of 96,064,286 common shares at a price of seven cents per share for aggregate gross proceeds of \$6,724,500. Interesting is they attracted the likes of Dundee and Sprott into this financing.

Their Molo Flake graphite deposit in Madagascar is advanced with a Feasibility Study, Environmental permit and mine permitting has started. Capex is \$188 M that includes \$24 M contingency. They require off takes and mine financing.

There is a lot of shares out at about 461 million with recent financing and that was my biggest concern. A poor chance of getting mine financing. With Dundee and Sprott now investing I would have to say that they see a road to mine finance ahead, **so I am moving Energizer up a category to the Turkey shoot as they could be among the next 2 or 3 to production.**

### **Great Lakes Graphite TSXV;GLK Market Cap \$10.6 M**

GLK is sourcing graphite to produce micronized synthetic graphite at a small plant in Ontario - to sell to customers. They have made some progress but it has been slow and small so far with 8 tonnes of material delivered.

Recently they received some more purchase orders, each specifies 20 tonnes of material and takes the number of orders that Great Lakes has now received from this customer to a total of seven, representing 140 tonnes of graphite products.

The question is, can they grow and expand and make this a significant revenue source

## **Overall Summary**

If you believe that EVs are on the rise and all these new giga factories will be built creating huge lithium ion battery demand then it would be wise to invest in this sector.

I don't need convincing, I know it is coming and my projections of demand here are probably conservative.

There is lots of nay Sayers in North America and the EV is disruptive technology. However, we are way behind Asia and Europe in this regard and so is the thinking of main stream investment flows.

With Tesla Model 3 and Chevy Bolt coming to market in North America you will see a much quicker movement to EVs and we might start to catch up with Europe and Asia.

What you should garner from this report is that the graphite market will feel the most bullish effect.

**While the past year, a lot of investors jumped on the lithium band wagon so they are buying into the battery growth story, they just are not making the best investment at this time. That will change as reality eventually hits home .**

**Soaring battery demand will create 5 to 6 times more demand for graphite than lithium**



I will repeat, if you dig up the facts and numbers

**Soaring battery demand will create 5 to 6 times more demand for graphite than lithium.**

This is your advantage to be one step ahead of most.

I understand the next generation battery will probably have even more graphite in it.

There are signs the graphite market is starting to awaken again from it's slumber, correction, whatever.

In the spring I highlighted that Mason Graphite broke it's down trend line and it has now doubled in the past 6 months. Zenyatta has just woken up and broke out of the down trend channel and over the 200 day MA.

This is like a knock on the door, *hello we are coming back*

Mason



Zenyatta



**I believe the best two stocks that will be in position to benefit from this battery and graphite boom are Syrah and Elcora and that is where I would put the majority of \$\$.**

The other companies, listed in what I call the Turkey shoot have some great potential and will ride up with the tide. The main problem with these is they are all at least 2 years or longer away from production.

In a way that is good news because it will mean more tightness in the graphite market. Syrah will help fill the demand in 2017 but they will not hit full production until 2018 and by that time more giga factories will be on stream and way more than Syrah's production will be needed.

Some new production could come from Australia, Valance Ind. could add production, that would easily be absorbed, but like North America most projects are at least 2 years away.

Lincoln Minerals has a mine permit, but at best construction could start in 2017. Kibaran has advanced projects in Tanzania but needs financing so is years from production as well.

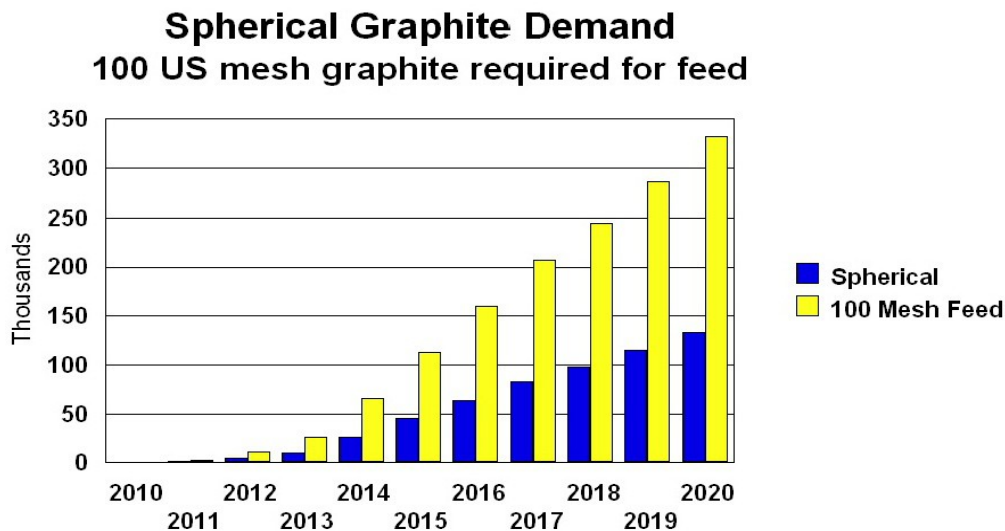
You can see that the so called smart or big money is moving into graphite, Dundee and Sprott into Energizer, Mason is a bought deal financing by major investment banks. Syrah was all institutional money.

Once this big money gets in, next they will push it down their retail channels and the graphite junior market will spring back up like lithium has.

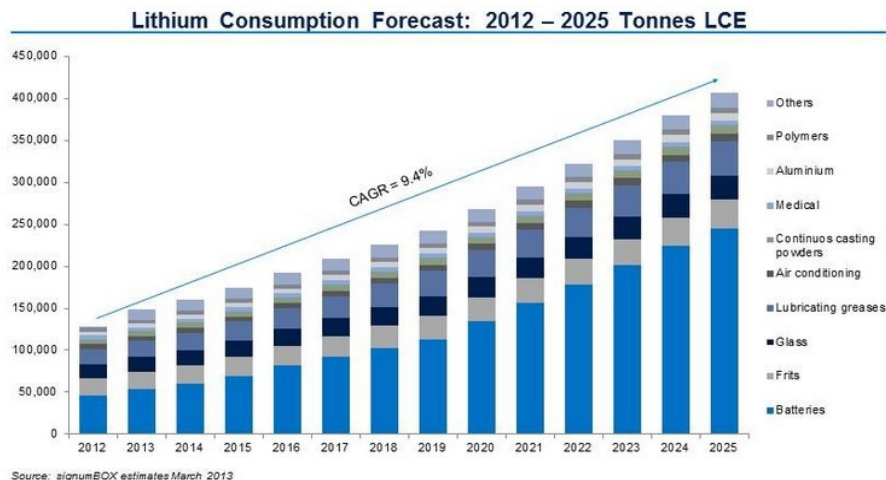
The writing is on the wall and the green signal lights are bright, the time to jump in is now while these stocks are at attractive buy levels.

After **Syrah-SYR** and **Elcora-ERA**, you could look at a few others. Mason has already seen a big move so I might be most inclined with **Northern – NGC**, **Alabama-ALP** and **Energizer-EGZ**

This last chart I did in the spring from information from an Anode manufacturer. It is probably quite conservative, as for one thing it does not include significant demand that is coming from Tesla's Energy division.



Here is one more clue, if you compare these charts – one is wrong



I looked at a dozen or more charts and projections on lithium and they all are saying by 2020 that lithium demand for batteries will be around 100,000 to 120,000 tonnes per year. Since we know there is about twice as much spherical graphite in batteries - by 2020 we would require 200,000 tonnes of spherical and more like 600,000 tonnes of 100 mesh feed.

From this there is 3 possible conclusions:

- Lithium demand is forecast too high
- Graphite demand is forecast too low
- or trends will reverse and the market start using more expensive synthetic graphite

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