Betting the farm on lithium in the short term and the long term.

Politics Before Economics: The Coming Train Wreck of Peak Lithium, Mandated EVs, and Alternate Electricity Generation

This is the best time ever to invest in lithium mining and processing because the legacy global OEM automotive industry as well as dozens of newcomers, including TESLA, have bet their continued and future existence not on the market but on the politically mandated ultimate replacement of internal combustion engine power trains by rechargeable battery fueled electric ones. This powertrain replacement is to be 100% dependent on lithium-ion batteries to store the electricity (i.e., fuel) to supply the electric motors that will replace fossil fuel using internal combustion engines. These EV batteries are, for their operation, 100% dependent on the chemical element, lithium.

At the same time, the politicians have also decreed that the generation of relatively inexpensive electricity, which today is mostly done by the use of the fossil fuels, coal, oil, and natural gas (with the balance, more than 20%, coming from nuclear) shall be completely replaced by alternate forms of electricity generation dependent upon the wind and the sun with their excess outputs stored until needed in lithium ion batteries. Wind and solar are, at best, intermittent, and they are therefore not remotely reliable or dependable. They exist only because of government subsidies and, worse, mandates. Alternate energy generation being intermittent must be smoothed out (continuously maintained) ideally (in the Green

Dream) by backup batteries. This would ultimately require enormous quantities of lithium, more than for EVs, for the gigantic smoothing and backup systems that would be necessary.

From the perspective of the supply of the key critical battery metal, lithium, these two goals, electrification of mobility and stationary storage of electric power for grid smoothing are competitive with each other for lithium, and this competition shows the complete ignorance of politicians and manufacturers of the fact that the overall demand for lithium from the two mandated uses cannot possibly be supplied from currently existing, planned, or known accessible sources.

A recent article in the Wall Street Journal states that "mining is like anything else. Eventually high prices stimulate more production. But the slow real-world expansion capabilities of mining explain the IMF's forecast that mineral inflation would last "roughly a decade" until supply catches up."

This is utter nonsense.

Mining any natural resource is entirely dependent on the physical accessibility of the resource, the grade (concentration) of the desired mineral, the ability of deployable technology to extract the desired mineral, the economics of the processing of the mineral concentrate to a usable form, and that the total costs incurred by the entire supply chain can be borne by the selling price for the end user products enabled or manufactured from that resource.

Supply of anything cannot "catch up" to demand if that supply is limited by a maximum price limit for the demanded form and for the accessibility, grade, and applicable process technology for the "deposit."

The highest grade accessible and processable deposits of lithium from brine and from hard rock minerals are, respectively, in Chile, Argentina, and Australia. These

deposits are already mined at scale and represent the lowest cost of production today. So, since the highest grade, accessible, physically and technologically, deposits are in production why can’t they just ramp up and supply any amounts of lithium needed? Those writers who are ignorant of geology, mineral economics, and geopolitics, and who are not aware of the limitations of contemporary known deposits of natural resources, think that lithium production is organic, i.e., that to get more lithium you simply do more mining. But, in fact, all mineral deposits decline in grade and fall below economic grades after a time. The period during which the mine is projected to be profitable is called, for that reason, the life of the mine.

In 2007 the global production of lithium, measured as metal, was 16,000 tons. In 2021 that figure was 86,000 tons, a 5.5X increase. Yet at the beginning of 2022, the price of metallic lithium, $60,000 a ton in January 2021 had reached $360,000 a ton! I note that lithium metal is now more expensive than silver.

Why?

The demand for lithium today just for batteries is 60% of global lithium production, and new battery factories are coming online and being planned and under construction daily. The total demand for lithium for all of these factories by 2025 is calculated to be 2.5 times total global lithium production in 2021. By 2030 that figure would be 5 to 10 times the total global 2021 output of lithium.

It is likely that the lithium supply is already in deficit due to existing battery factories buying for inventory and traders buying for speculation.

The legacy OEM car/truck makers have almost all allocated essentially all of their R&D capital and their new manufacturing construction to EVs. The better managed ones

realizing that the total conversion of their outputs solely to EVs cannot be supported anytime soon, if ever, by the lithium supply chain and that the cost of such vehicles is already prohibitive in the mass market are hedging their bets by continuing to plan for a mixed output of EV and fossil fueled powertrains indefinitely.

Mis-allocations of capital in the most capital intensive industry on earth, the OEM automotive industry, cannot be reversed rapidly, and the damage to competitive advantage from losing the lead in internal combustion engine and transmission development could be fatal. This misallocation is not confined to the assembly operations of the global legacy OEMs. It could also be fatal to suppliers of ICE specific components.

There are today some 1.5 billion ICEs in use globally, and the number is growing. Imagine that each of them will use on average 4 kg of lithium, measured as metal, for a 50 kWh lithium-ion battery. A Tesla Model 3 uses 6-8 kg for a 100 kWh battery. So to replace just today's powertrains would require 6 billion kg of lithium, or 6 million tons of lithium, or 36 million tons of LCE (lithium carbonate equivalent). This is more than 70 years total global 2021 lithium production with nothing left over for the stationary storage market for grid smoothing of wind and solar generation. Neither conversion will ever happen, because it is beyond the capability and capacity of our current know-how in mining, refining, and fabricating the end-use raw materials.

The looming and fatal to the green revolution lithium supply deficit has spawned an enormous price increase for the metal and its compounds, which has reversed the steady decline in the costs of lithium-ion batteries.

But is it too late to stop the attempted suicide of the global OEM automotive and electric energy generating industries?

Cars and trucks running on high priced electricity generated

by increasingly expensive wind and solar systems backed up by hugely expensive stationary storage battery parks will not have large enough markets to be self sustainable or reasonably priced.

Lithium mining and processing will boom until no one can afford the vehicles or the electricity. At some point before that occurs the decarbonization of Western society will reverse and steel, aluminum, oil and gas will return to their central place in our world of cheap energy. Until then look for lithium, the rare earths, copper, and uranium to enter a long Super Cycle.

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Don Bubar on the business of lithium today

“The lithium business it is all about finding where to position yourself in the marketplace with the type of resource you have. Ours is a different one with different minerology than many of the resources that are being looked at now to serve the battery industry. As you recall, historically we looked at it primarily as an opportunity to produce an industrial mineral product for specialty glass and ceramic products. That is still a pretty big market out there. That is an opportunity for us to serve especially now that lithium is becoming more scarce for the glassmakers out there now that the battery industry has come along with a huge appetite gobbling up a lot of the available supply.” States Don Bubar, President, CEO and Director of Avalon Advanced

Materials Inc. (TSX: AVL | OTCQX: AVLNF), in an interview with InvestorIntel Corp. CEO Tracy Weslosky.

Tracy Weslosky: Don you have just put out your East Kemptville Tin Site PEA results. That is a former producer and is an advanced stage project. Can you tell us what these PEA results meant for us as investors?

Don Bubar: Basically Tracy they are confirming that it is an economic proposition for us. While it is small-scale the whole approach has been to do something innovative there in terms of how we can approach this brownfield site with a model for addressing the long-term environmental liability there, remediating that, fully rehabilitating the site while extracting value out of the waste materials that were left behind on the site. We needed to show that that could be done economically. Effectively the PEA results confirm that. Will not make a lot of money, but it will be a really good interesting new model for how one can apply innovative thinking and new technologies to these brownfield sites that tend to be treated as perpetual liabilities as opportunities for entrepreneurs to extract value out of these sites.

Tracy Weslosky: Okay, well, that sounds very exciting to me. The industry has always acknowledged you for being a leader in sustainability and this type of forward thinking. You also have an advanced stage project in Kenora, Ontario, lithium. Can you tell us how that project is proceeding?

Don Bubar: That is coming along slowly. As you know, with the lithium business it is all about finding where to position yourself in the marketplace with the type of resource you have. Ours is a different one with different minerology than many of the resources that are being looked at now to serve the battery industry. As you recall, historically we looked at it primarily as an opportunity to produce an industrial mineral product for specialty glass and ceramic products. That is still a pretty big market out there. That is an opportunity

for us to serve especially now that lithium is becoming more scarce for the glassmakers out there now that the battery industry has come along with a huge appetite gobbling up a lot of the available supply. The resource is ideally suited to that with this high purity lithium mineral petalite. We are now looking at that as, sort of, near-term development opportunity, get into production, produce the industrial mineral product, which is much lower capex than trying to make the battery material, establish an operating profitable business. Then build on that by expanding, as you see, the opportunities to further serve some of the growing markets going forward. We think that is a much more conservative and less risky way to get started in the lithium business and position yourself with a stage development model and open to different possibilities on how to serve the markets…to access the complete interview, click here

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Lithium investors need look no further than Galaxy Resources

Galaxy Resources Limited (ASX: GXY) is an Australian lithium miner with three lithium projects globally. Unlike their much larger peers, they are a pure play lithium miner. Galaxy recently agreed to sell their northern Sal De Vida tenements to POSCO for US$280m, thereby boosting Galaxy’s balance sheet and de-risking the Company once the sale completes in Q3, 2018.

Mt Cattlin lithium spodumene mine – Western Australia

The Mt Cattlin mine has ramped up lithium spodumene production to reach 47,901 tonnes in Q2 2018, at an average cash margin of US$534/t. On a yearly basis that works out to be ~US$100m just from Mt Cattlin.

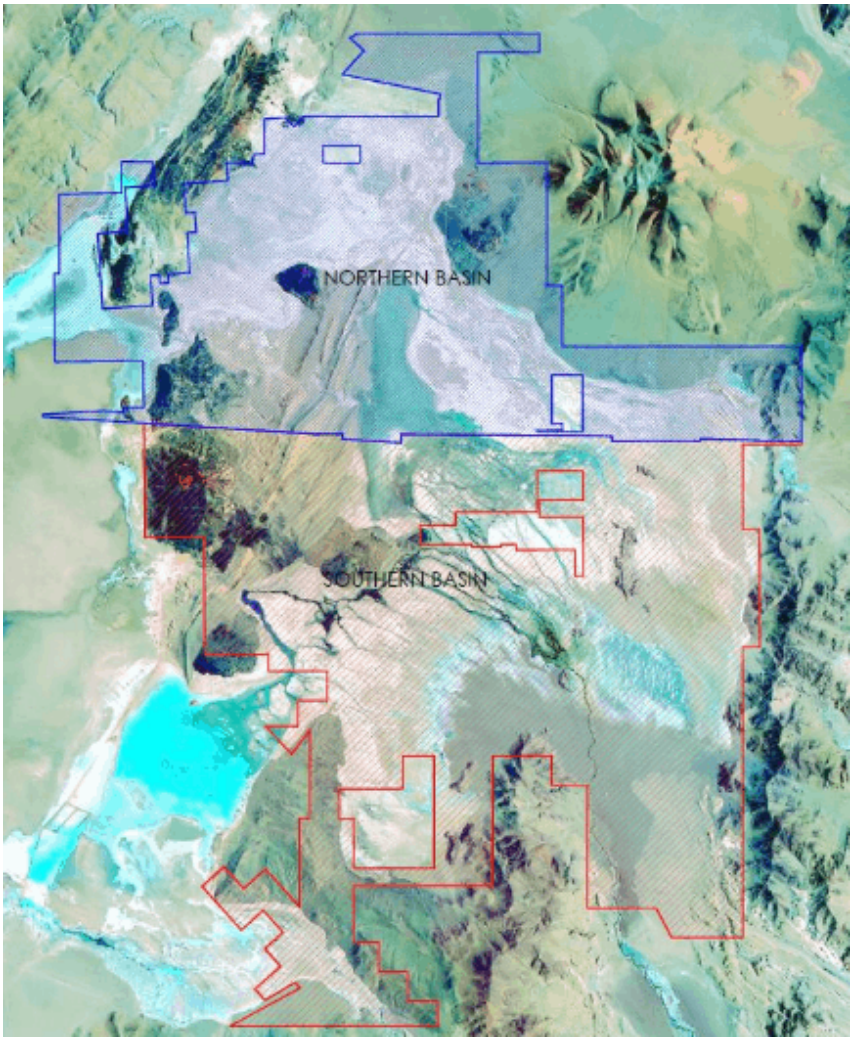
Mt Cattlin

Sal De Vida (SDV) lithium brine project – Argentina

After the sale of the northern tenements of Sal De Vida to POSCO the total resource estimate for Galaxy's retained SDV falls to 4.09 million tonnes LCE (at a grade of 780mg/L), as Galaxy retains the southern tenements. The reserves estimate of 1.14 million tonnes also remains unchanged. The key point here is that Galaxy still has a very large high quality resource. The latest Feasibility Study results (post tax NPV8% of US$1.48 billion) is therefore unchanged as it did not include the northern tenements.

On July 9 the Company announced (regarding the POSCO sale): "The Company advises that the agreed timetable for completion of this transaction continues to be met, with notice received from POSCO on 6 July that their investment review had been completed satisfactorily. The transaction remains conditional

on execution of definitive documentation and final POSCO Board approval which is still expected during the third quarter of 2018.”



SDV tenements map – Blue sold to POSCO, and red retained by Galaxy

James Bay spodumene mine – Ontario, Canada

Galaxy Resources continues to slowly advance their final project at James Bay. The Feasibility Study is in progress as is further metallurgical test work and ongoing engagement with the local Cree community.

Valuation

As of June 30, 2018 Galaxy had US$84.8 million in cash, and no debt. Current market cap is AUD 1.25b and enterprise value is

estimated to fall to AUD 860m or lower (after the POSCO sale completes). 2018 PE is 10.4. Analyst's consensus target price is AU$4.04.

With the POSCO sale due to complete sometime in Q3 2018 Galaxy Resources should receive a significant re-rating given the fact the sale proceeds of US$280m (plus ~US$200m retained Mt Cattlin earnings) will be enough to allow Galaxy to self fund Sal De Vida (CapEx US$474million). Looking ahead once Sal De Vida is up and running it is projected to earn an EBITDA of US$270 million for a project life of 40 years (40 years x 25,000tpa). Finally James Bay could be brought on quite easily using existing retained earnings say by mid 2020's as global lithium demand requires. Once all three projects are running Galaxy Resources could be looking at combined EBITDA of ~US$500m pa (100m + 280m + 120m). Applying a 10x multiple to this would suggest Galaxy is headed towards an Enterprise Value of ~US$5b by the mid 2020's, which would be 5.8x higher than now.

Investors need look no further than Galaxy Resources for a lower risk, high reward, pure play lithium miner. The pathway ahead looks very achievable, and should significantly reward the long term investor looking to buy and hold until 2025 and beyond.

International Lithium's Kirill Klip on the future of electric cars

March 14, 2018 – "Because I am not talking about 2% of electric cars being sold worldwide, and we are just closing on

that number only now, I am not talking about 5% or 10%. I am in this business because I know all cars will be electric.” says Kirill Klip, CEO, President and Chairman of International Lithium Corp. (TSXV: ILC), in an interview with InvestorIntel’s Jeff Wareham.

Jeff Wareham: Kirill, lithium has been all over the media in the last little bit, all kinds of bullish sentiment and then we had the report last week. What are your thoughts on the most recent report that claimed that the lithium market was oversupplied for hundreds of years to come?

Kirill Klip: Thank you Jeff. Thank you for having me today. As you know, I am quite active in my social sphere with my blog and everything. I called this SQM lithium oversupply scare 2.0 because I still remember 1.0. I still remember when we all gathered in Las Vegas. It was the second lithium supply and demand conference. Three big boys at the time, one was SQM, they were talking, we can supply lithium for 1,000 years. Now, as you know, the first shot across the ball was made in January with the report of one Australian bank, I will not go in a lot of details here, when they scared all the market again, now SQM has a new license and maybe they can produce 216,000 tons of lithium carbonate equivalent, LCE. To put things into perspective UBS now estimates that annual demand for lithium will be over 1 million tons for lithium, LCE, after 2026. Then we can move, of course, to the Morgan Stanley report which basically just picked up the same story one month ago. Now they scared all the market with additional supply, which still has to materialize, of just over 200,000 tons or maybe in total half a million tons of lithium.

Jeff Wareham: Alright Kirill. Thank you for clearing that up a little bit. It is great to get some color on it. How does that impact International Lithium?

Kirill Klip: As all junior mining companies, we had a very healthy correction. I will call it like this because in the

investment world the entry point is everything because we always remember the very famous sentence, which is very difficult to implement in real life. Buy low, sell high. Now a lot of investors who really would like to study this market, they have a great opportunity to enter this market at a much better level. I can tell you why I am not personally scared, why I have just invested again in International Lithium in the latest round of our financing. Because I am not talking about 2% of electric cars being sold worldwide, and we are just closing on that number only now, I am not talking about 5% or 10%. I am in this business because I know all cars will be electric. I can talk forever. You will stop me at the right moment. Because now, just a few days ago, the high court in Germany allowed German cities to ban, I call them, die-sel cars. I call them die-sel, not diesel because we are dying because of them. Now who in their right mind will buying any die-sel car because you will never be able to sell it. All cars will be electric much faster than a lot of people will be anticipating it. I am investing in my big picture when we will have to produce, wait for it, 100 million tons of lithium by 2050…to access the complete interview, click here

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TNR Gold's Klip says all cars will go electric much sooner than anticipated

March 14, 2018 – "I am really in this game because I believe that all cars will be electric much sooner that a lot of

people are anticipating. It means that we will have to produce, moving from today's level of just 217,000 tons of lithium carbonate as a market total in sales to 1 million tons annually," states Kirill Klip, CEO and President of TNR Gold Corp. (TSXV: TNR), in an interview with InvestorIntel's Jeff Wareham.

Jeff Wareham: Kirill is the executive chair of TNR Gold. Now the name confused me, Kirill, because to be honest with you as much as I like gold I love what you are trying to do. Can you tell me what TNR is up to?

Kirill Klip: Thank you very much Jeff for having me today. We are building on a base of TNR Gold, the green energy metals royalty company. Our roots go far back. The company is more than 20 years old. I joined it 10 years ago. One of our most exciting projects, in the gold now, will be in Alaska, Shotgun Gold; right close in proximity of Donlin Gold. Now, as we know, Alaska is heating up, if I may, for mining again. My real dream is to build the green energy metals royalty company. I still remember the days when I was buying Royal Gold, if you remember. I was lucky enough to buy it below $5. Then, of course, I was very happy to sell it over $70. I would like to do the same, but now in the space of so-called energy metals.

Jeff Wareham: Okay. What energy metals excite you?

Kirill Klip: Energy metals excite me because I really think that we are at the very beginning of the megatrend and very famous now in our still small circles is the Morgan Stanley report, which almost halves the valuation of all lithium mining companies. Just telling me we are at the very, very beginning of this megatrend because at the moment we just crossed 1% in sales of our general so-called internal combustion engine, so-called ice cars being taken over by electric cars. Now they are closing on 2%. As we discussed just recently in my interview about International Lithium, I

am really in this game because I believe that all cars will be electric much sooner that a lot of people are anticipating. It means that we will have to produce, moving from today's level of just 217,000 tons of lithium carbonate as a market total in sales, to 1 million tons annually. It is not my focus, but by UBS. Then I will give you my focus. We have to produce in total 12 million tons of lithium by 2030 just to have 200 million electric cars worldwide, and then up to 36 million tons…to access the complete interview, click here