NEWSLETTER //MAY 2020

Clawing Our Way Back Up

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Jon Hykawy, PhD
President
jon@stormcrow.ca

Tom Chudnovsky
Managing Partner
tom@stormcrow.ca

Viruses and Batteries and Vehicles and Stuff

In this issue we discuss:

- **A Tale of Two Markets** If you are selling lithium hydroxide for batteries outside China, then you are doing well. If you are selling pretty much any lithium or battery-related chemical inside China, things aren't so good.

- **Car Sales Coming Back** In the spirit of the glass being half-full, at least the sales of new energy vehicles in China went up in April. This is a very good thing, because the annualized sales for the first three months of the year were awful. Of course, the annualized level even on the basis of April alone isn't good.

- **As Goes Tianqi, so Goes the Industry?** At least for the next while, this is probably true. If Tianqi finds a lifeline and/or a buyer for some or all of their Australian assets, then we might hope to see a bottom in the lithium and maybe the wider battery chemicals market. If not, well, we believe that we have a long and cold winter coming.

- **Random Thoughts About the Pandemic** Based on some of what we have been reading, as well as some simple numeric modeling, maybe both sides of the debate in the US have some truth on their side.

As a Matter of Introduction…

This is our ninth (semi)monthly newsletter! Time flies when you are having fun. While we never produced a newsletter filled with cautions about the "best cure for high prices being high prices " during the recent lithium heyday that extended through the middle of 2017, those who sat in on Stormcrow talks at conferences know that we were out there saying it. But we feel even more strongly that the old maxim about the "best cure for low prices being low prices" is every bit as true, and given some pessimism around the battery materials market now, we believe that realism is required.

First, for those who don't know, Stormcrow deals with the markets for critical materials. Generally speaking, what amounts to a critical material is in the eye of the beholder, but we think of them as materials that are essential to making a product with the properties intended by its designers, even if those materials are not anything like the highest-cost item on a bill of materials. As an example, think about lithium in the battery of your cell phone. That lithium costs pennies as a raw material, but if your cell phone manufacturer was forced to do without it then the resulting cell phone would bring with it a very, very different operating experience than it currently does.

Over the coming months, we are going to deal with our views of the market prospects for some critical materials, and interesting facts about others. We will talk a little about technology and the impact, both good and bad, that it can have on demand for critical materials. We hope you find this interesting and worthwhile! Note that when not writing newsletters like this one, Stormcrow Capital functions as a corporate adviser (capital markets / financing / M&A) in the critical materials sector. We are registered as an Exempt Market Dealer in Canada *(additional disclosures included at the end of this note).*

A Tale of Two Markets

Prices in April were headed back down, again. Obviously, demand destruction has never been as intense as over the last few weeks, not in modern times. The prices in China, from beginning of April to end of that month, moved as follows:

Battery-grade $LiOH \bullet H_2O$ down 2.6%

Battery-grade Li_2CO_3 down 5.4%

Battery-grade $CoSO_4 \bullet 7\ H_2O$ down 13.0%

Battery-grade $NiSO_4 \bullet 6\ H_2O$ down 5.7%

Obviously, there are bigger problems for the prices of cobalt sulfate and nickel sulfate than just batteries, since it's a pretty safe bet that demand of cobalt and nickel from the steel industry has plunged and sent prices of the metals with them. On the lithium side, we believe that the shortage of battery-grade hydroxide is now a slight surplus, at least for the moment. Unfortunately, a surplus of lithium carbonate has become a flood.

This conjecture seems borne out by price movements since the end of April (as of 16 May). The prices for battery-grade lithium hydroxide, nickel sulfate and cobalt sulfate are little changed, but the price for battery-grade lithium carbonate has plunged another 5%. Demand for automotive lithium batteries is coming back, but is still nothing like that of 2019.

New Energy Vehicle Sales Rising Up

The Chinese Association of Automobile Manufacturers (CAAM) reported that April new energy vehicle sales were up from March levels and managed to reach a respectable 72,000 units, although this was still down nearly 27% from April 2019. Production was 80,000 units, so there are another 8,000 units sitting around that need to be liquidated over the coming months.

If we looked at the first three months of 2020, hit by both the Lunar New Year and then COVID-19 in quick succession, then April sales don't look too bad. Total sales from January through March, inclusive, were only 115,800 units, give or take. That yields a total annualized sales level of only 463,000 units compared to the final sales in 2019 of 1.15 million units. The increase in April at least gets us to annualized sales of more than 563,000, but clearly 2020 is not likely to be a year to remember, at least not for new energy vehicle sales.

However, we remain convinced that electrification is an unstoppable trend. That is because it is entirely possible to build a light-duty vehicle that combines a small battery and a small range extender that can be made less expensively, have far lower operating costs than conventional internal combustion vehicles (ICVs) and result in fewer operational compromises than the current crop of battery electric vehicles (BEVs). The legislative goal should be to produce a vehicle fleet that not only lowers global CO_2 and other emissions but that can also be made by the global automobile manufacturers at not just a profit but a better profit than they would generate selling ICVs. Otherwise, frankly, what's the point?

As Tianqi Lithium Goes, So Goes the Industry?

For those who have not been paying attention, Tianqi Lithium is one of the most important participants in the battery materials sector. As 51% owners of the Talison JV in Australia, and with a major new lithium hydroxide plant under construction at Kwinana, Tianqi is a very significant player in lithium primary extraction. Talison's Greenbushes Mine is one of the very few hard rock deposits that can economically produce spodumene concentrate even at these lithium prices.

At the end of 2018, Tianqi completed the purchase of about 24% of SQM in Chile. Tianqi borrowed in what was a relatively easy money market at that point in China in order to acquire that stake. But with lithium prices falling and money drying up, it has become difficult for Tianqi to service its debt and make money. It became public knowledge around April 19th that Tianqi was examining strategic investment, sale of part or all of its stake in Greenbushes Mine, sale of part or all of its Kwinana lithium hydroxide plant or some combination to help repay this outstanding debt.

So in a very real way, the fate of Tianqi will show us the way our market is going to evolve for the foreseeable future. If Tianqi find a buyer or investor at good prices, then we can become at least a little more relaxed about the prospects for the industry. At the opposite extreme, if even Tainqi's partner in Greenbushes, Albemarle, are unwilling to take a larger stake in the Greenbushes Mine, this is a likely indication that we are going to see hard times ahead.

As of the morning of May 19th, and an announcement that Tianqi Lithium's parent company, Chengdu Tianqi, is selling a 6% stake in Tianqi Lithium (from their roughly 36% holding), one can be forgiven for thinking that the situation is not good. We will remain on watch.

Random Thoughts About the Pandemic

Cases seem to be declining in many places in North America and the United States. Unfortunately, there is a disturbing tendency to believe that the pandemic is past and to want to simply drive back to work and stop off at Starbucks for a morning coffee like nothing ever happened.

I am not an epidemiologist or virologist, but I can build a simple model of disease spread and look at a wider picture as well as anyone. It seems to me that both sides of the debate regarding what to do in the United States have some of the answer, and if the past holds true neither side will want to give an inch to their hated enemy and agree on anything.

We have no vaccine against SARS-CoV-2 and no effective treatment. Faint hope and weak data notwithstanding, hydroxychloroquine ain't it. Nor, very likely, is the repurposed Ebola treatment, remdesivir. To a mostly disinterested non-American, the early data regarding remdesivir seemed to allow for the rapid approval of a drug that might not do much but at least wouldn't hurt anyone too badly, simply to give the citizenry hope. The best weapon against a plague for which we have no preventive and no cure is the oldest weapon against disease, namely quarantine. But as others have pointed out, quarantine has nasty side effects, too. Our economies have collapsed, and without abundant government support, many will suffer from this aggressive treatment.

The main goal for "social distancing" was to prevent the health care system from collapsing under the strain. We could not stop every death, and we have not. If we were certain to have a vaccine or a highly effective treatment in a few months, then we should continue to take the medicine of economic shutdown, stave off as many deaths as possible and wait for the cavalry (which begs the question of why the curious position of the President of the United States; if a vaccine will, without question, be available by the end of this year, then the logical approach would be to shelter in place and preserve as many lives as we can for the brief period until we can be inoculated and made mostly immune). But a vaccine might be nine months or 24 months away. A new drug treatment might be available next month or in three years. It seems fairly clear that, barring massive government intervention, we can't keep the economy in stasis for even a year.

Unfortunately, we have an even bigger worry. The reason there were a good number of ventilators in hospitals before this pandemic is that every fall and winter those hospitals are inundated with patients that fall prey to seasonal influenza. In spite of vaccine, flu returns every year. Like influenza, SARS-CoV-2 will very likely return in the fall to wreak more havoc, because only a small fraction of the population, even in places as hard hit as New York City, appears to have caught COVID-19 and have (we hope) some level of immunity to reinfection. This fall, we may have to face the prospect of COVID-19 and seasonal influenza working in tandem. And that may well overload the medical system even with social distancing in place.

I am glad that I don't have the exact data or the models to worry about having to make a decision such as the one I suggest must be made. But I hope that a very good team of epidemiologists somewhere is determining whether it would be better to keep our nations shut down and risk a rise in both COVID-19 and seasonal influenza in the fall and winter, or whether it would be better to relax social distancing restrictions and allow a fraction of citizens to become ill while we have the capacity to successfully care for the most seriously sick.

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