

Viruses and Car Sales

In this issue we discuss:

- **Goldman was Right!** Or maybe not exactly. Goldman Sachs research has been calling for a bottom in lithium chemical prices. We may be at that bottom, at least based on the reaction of lithium chemical prices in China. Problem is, with COVID-19 putting a strong, negative drag on most things in China and definitely including new energy vehicle sales, prices may look stable but volumes are also very small which makes any conclusions suspect. We continue to believe that we will achieve supply/demand balance in lithium later in 2020, with a few prospective bumps between here and there. And for what it's worth, coronaviruses of all kinds tend to stop spreading when the heat and humidity of summer comes knocking, especially on top of quarantines.
- **What Happened to Car Sales the Last Time?** SARS in 2002 was the last time China saw a significant disease-induced slowdown. Following that, the marketing interpretation was that many people decided they didn't want to be stuck in the subway with their fellow citizens and breathing the same air, so car sales rocketed higher. Of course, that was 16 years ago, most people who can buy a car already have and China has made it much harder for someone to just spontaneously decide to own a car and then make the purchase. The exception to a lot of that licensing and paperwork is when the purchase involves a new energy vehicle, but we would suggest that purchases won't skyrocket the way they did in 2003.
- **What Does Success Look Like?** What happens if BEVs are truly successful? There may well be bottlenecks in critical material supply. There are solutions that lead to growing demand and steadily increasing prices, which is what we all should want. Auto makers need to be taking steps now to ensure access to materials and market stability.

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As a Matter of Introduction...

This is now our seventh monthly newsletter, and the second for 2020. Happy (belated) Lunar New Year! Again, 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 characteristics 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 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 have 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*).



Prices are Stable to Better

Prices in January were not as badly hammered as they have been. Some prices actually did well:

Battery-grade LiOH • H₂O down 1.4%

Battery-grade Li₂CO₃ down 4.1%

Battery-grade CoSO₄ • 7 H₂O UP 13.3%

Battery-grade NiSO₄ • 6 H₂O down 1.1%

Spodumene concentrate prices weakened by USD\$10 per tonne between the end of December and end of January but have not weakened further since. The Spring Festival kept things slow, and COVID-19 has done so since. Still, in the last few weeks of February prices in China have flattened for battery-grade lithium chemicals and for battery-grade nickel sulfate, and prices for battery-grade cobalt sulfate have increased significantly. The only caveat to all this is that volumes have remained poor as the Spring Festival bled into the COVID-19 slowdown bleeds into the current malaise engulfing many parts of China. But we are hopeful that as spring arrives and both the warmer weather and high levels of vigilance knock back COVID-19, we can see prices continue to turn with higher volumes for some time to come.

Automobile (and New Energy Vehicle) Sales to Come Roaring Back in China?

Well, there is always a lesson to be learned from history. In November 2002, the first cases of what came to be known as SARS were recorded in China. The outbreak obviously took a human toll, with 8,098 identified cases and 774 deaths recorded globally. But truly, this amounts to very little against the scale of annually recurring infections. So far this influenza season, the US CDC's Disease Burden tracker notes that 29-41 million cases of influenza have likely occurred, leading to 13-19 million medical visits, 280,000-500,000 hospitalizations and 16,000-41,000 deaths. All this from a disease that has available vaccines and that we understand, which is probably the source of our complacency regarding influenza.

Yet after the SARS outbreak, automobile sales in China grew by roughly 70% in 2003 compared to 2002. It's thought that many bought their first cars in 2003 because (a) they were financially able to do so and (b) because they no longer wished to be stuck in public transportation with potentially sick fellow citizens. Is there any hope that the same sort of boost to sales could happen in 2020?



The answer we would give is that we suspect there will be a boost in sales, and likely this boost will impact new energy vehicle sales the most. However, there is no potential for the magnitude of that boost to rival that in 2003. Argonne National Laboratory shows that historical sales of highway-capable cars, trucks and buses in China in 2002 was approximately 3 million units, but by 2004 the sales of only those vehicle types was approximately 5.1 million units. This is due to the fact that the market in 2002 and 2003 was unsaturated in China, something that the decline in vehicle sales in 2019 compared to 2018 would suggest is no longer true.

But while the magnitude of sales growth cannot be as significant as it was in 2003, there is something else to consider. Those of an age in China to be buying their first vehicle in 2020 are far too young to remember the SARS outbreak. If they react the same as their parents, however, they will not have the same options in terms of buying a vehicle. In 2003, restrictions on the sale of new vehicles were minimal; if you had the money, then you could buy a car. Now, there are a significant number of restrictions in place, all in the interests of keeping traffic congestion at a manageable level. Except, of course, for new energy vehicles, where those restrictions are largely absent.

We do not have the data to even try to suggest an impact. However, we would suggest that if we do see significant sales growth in the latter half of 2020, barring a significant change in the regulations around purchasing a new fossil-fueled vehicle then that growth will likely disproportionately land on the purchase of a new energy vehicle.

Killed by Its Own Success?

What does “success” for the new energy vehicle look like, anyway? At this point, if you watch most mainstream media, you can be forgiven for thinking that about 30% of all new vehicle sales must be coming from Tesla. Even the “sober” financial markets have granted Tesla a market capitalization that, at present, exceeds that of Ford, General Motors and Honda, combined. So it might astonish some to find out that in 2019 the share of battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) was only about 2%. In a good month in China, the share of all new energy vehicles sold was 5%, but that hasn’t happened recently.

2% is not what anyone would call sustainable. To be successful, a technology generally has to gain more than a 25% market share. Now, we haven’t had a schism in what fuel a passenger vehicle uses in a very long time, but even some obvious choices such as natural gas have failed to gain much traction in the market.



Let's make a few assumptions. Let's assume that 30% of all new car sales at some point in the next 25 years are BEVs. Let's further assume that these BEVs are sold with a 43 kWh NMC 811 battery, which limits the amount of cobalt and manganese required for the battery packs. In a scenario where we are selling 30 million such BEVs every year, we would require (and this is ONLY for these vehicles) about 6x current annual lithium production, about 2x current annual cobalt production but only about another 1.2% increase in manganese annual output. Oh, and we would need to double current nickel production.

Now, a lot of these assumptions are very likely wrong. But one thing is certain, and that is that successful and sustainable market penetration of BEVs will require a much bigger supply of certain critical materials. That is very likely only going to come at a higher price for those materials, which means that the batteries being built for these BEVs, which already have a significant price premium being charged for them compared to gasoline-powered vehicles, are going to be even more expensive. As we have said before, the automobile industry is not military aerospace. The automobile industry cannot charge whatever they wish to achieve a level of performance, they need to conform to their market. But even more importantly, if the automobile industry cannot be certain that they can depend on the supply of a critical raw material in order to build a certain model, then they will not even try to build that model.

We are a long way from running into this type of constraint, because 2% market share isn't anything like 30%. But if the critical materials industry truly wants to build a sustainable market for its products, showing up to testify in front of the US Congress and prattle on about how the US should become more self-reliant and blah blah blah is not the answer. The answer is to work with automobile companies and legislators to develop a sustainable vision of what the automobile industry will look like in 30 years.

And for those interested in a view of that, might we suggest revisiting the comments made by several key Toyota executives over the last few weeks. In particular, this excerpt from a speech made by Larry Hutchinson, President and CEO of Toyota Canada, to attendees of the 2020 Canadian International Auto Show, is worth reading:

"So, here's something most people don't know [about the engineering efficiency of greenhouse gas reduction]: The average battery capacity in a BEV is about 60 kWh. The average battery capacity in a Toyota hybrid is 1.4 kWh. In practical terms, that means you could build 42 Priuses in place of the 60 kWh battery in one BEV. Forty-two Priuses — each reducing greenhouse gas emissions by 30 per cent — would have the impact of 12 ZEVs. So, the question is this: For the same resources — the same total number of battery cells — do you want the GHG reduction of one car?



Or 12? And that's 12 vehicles without range anxiety, government incentives, or even any infrastructure investment.

Please don't misunderstand me: I have a lot of respect for the work that Tesla and others have done in creating an aspirational market for zero emission vehicles. But the current approach to building EVs is not a silver bullet that will solve the environmental impact of the transportation sector. So close your eyes for a minute and imagine its now the year 2030. All of Toyota's cars have had an electrified option for the last five years. And, I'm happy to report that Toyota Canada has sold 300,000 vehicles.

Now, there was a time the government wanted me to attain a 30 per cent reduction in carbon by selling 90,000 ZEVs. Fortunately, saner heads prevailed, maybe because they ran out of incentive money. Instead, I sold 300,000 hybrids and reduced emissions by the equivalent of 90,000 ZEVs. And actually, we went way beyond that because some of those 300,000 vehicles were plug-in hybrids and fuel-cell electric vehicles. But let's keep this dream simple [and stick to just counting on straight hybrids]: I used 90 per cent fewer finite raw materials for batteries, didn't inconvenience any consumers, and saved the government deficits as no government incentives were needed.

My point is, if Canada truly wants to achieve meaningful carbon emission reductions from this sector by 2030, a single-minded focus on zero emission vehicles is likely to cause us to miss that objective. It's too expensive, too consuming of finite resources, and it entirely misses the point that carbon emissions are the result of the total number of carbon-powered kilometres travelled by the entire on-road fleet each year."

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