EVERYTHING YOU NEED TO KNOW ABOUT INVESTING IN LITHIUM

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KATUSA RESEARCH

DANGERS AND OPPORTUNITIES IN LITHIUM

How to Find Explosive Gains in the Lithium Markets

The First Step: Become a Key Supplier in the Booming Electric Car Industry

Common reactions to a car called the Rimac Concept S are “insane,” “ridiculous,” and “incredible.”

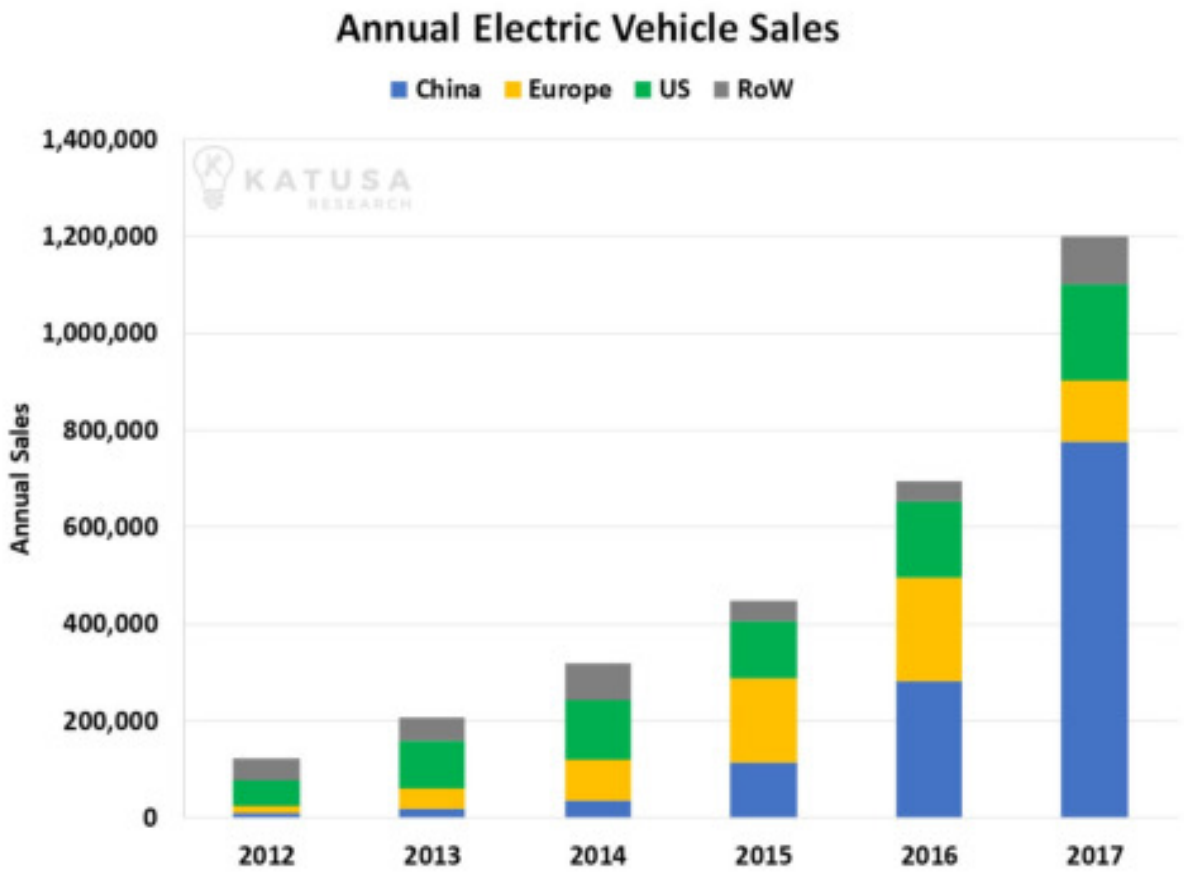
The Concept S can go from zero to 60 miles per hour in 2.5 seconds. Its top speed is around 226 miles per hour.

It can put an astounding 1,384 horsepower to work on the road – an insane amount of power when you consider that “just” 600 horsepower is a high figure for production sports cars. This makes the Concept S basically a rocket on wheels.

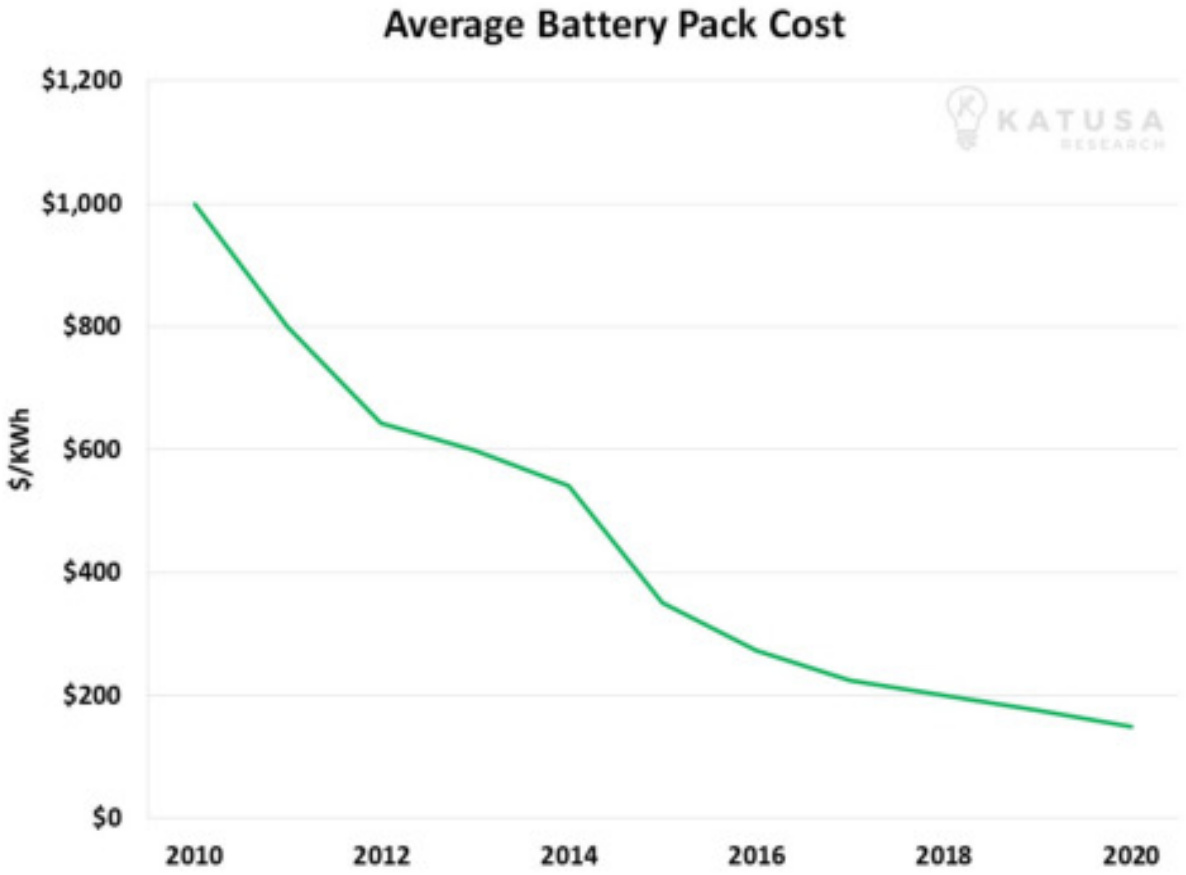
Unlike the big horsepower cars of the past, the Concept S doesn't burn gasoline or any kind of special liquid fuel. Every Rimac car is an electric vehicle. Concept S is one of the world's fastest, most powerful cars... and it runs on batteries.

Once confined to science experiments, electric vehicles (EVs) are now capable of incredible things... and they're rapidly becoming a common sight on roads across the world.

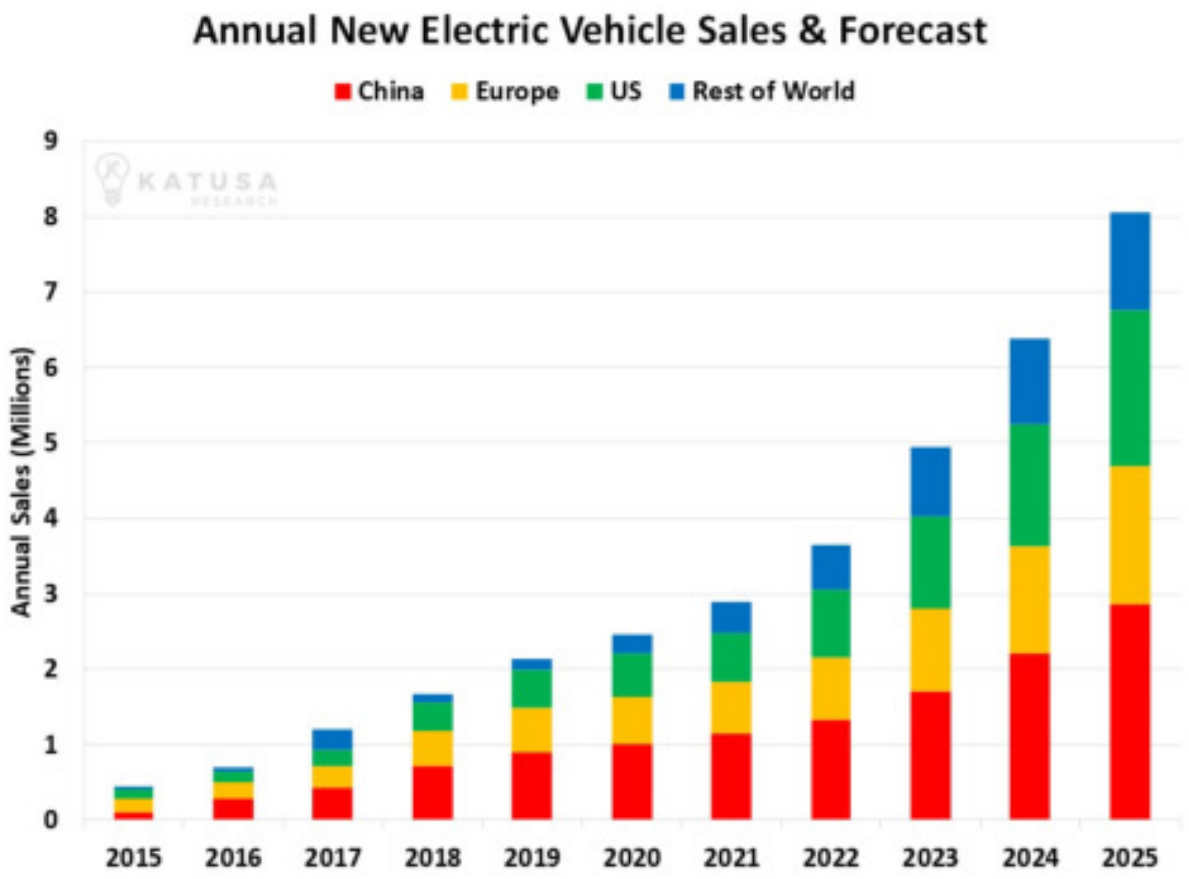
Every major car company is racing to build their own electric vehicle models. Just 10 years ago, there were virtually no electric cars on the road. It's estimated that nearly 1.8 million new electric vehicles will be sold in 2018. This science experiment is now the real deal, and it is changing the car owner mindset. Below is a chart that shows the enormous increase in EVs on the road since 2012.



A driving factor in building affordable electric vehicles is a decrease in the cost of car batteries. Since 2010, the cost of an electric car battery has declined by 80%. Below is a chart that shows this dramatic decline:



The International Energy Agency has set a target of 12.9 million electric vehicles in major markets by 2020 and 100 million on the road by 2040. According to Bloomberg's New Energy Finance group, by 2025, over 8 million electric vehicles will be sold each year. Below is a chart that shows the Katusa Research electric vehicle annual sales forecast. We are slightly more conservative than all of the think tanks.



The seismic shift from gasoline-powered cars to electric vehicles is a generational change. The U.S. electric car company Tesla is now comparable by market capitalization to General Motors and Ford… while selling a fraction of the number of cars of GM or Ford.

Tesla is given this high valuation because it is leading the change in the mindset of consumers all over the world. Tesla's CEO and founder Elon Musk is a visionary who is bent on making the world a better, more technologically advanced place. And Musk is a visionary that is pushing forward his agenda of using cleaner forms of energy for everything – especially in the form of cars.

So instead of gasoline, he wants every electric vehicle to run on battery power (which is common sense nowadays). And the vast majority of electric vehicles are powered by a battery you may have heard of: the lithium-ion battery.

Due to the electric vehicle revolution and implied battery demand, lithium has been an incredibly hot sector. Albemarle, the ExxonMobil of the lithium world, is up over 150% since January 2016 (and was up as much as 200% at one time). SQM, another major producer, is up 180% since January 2016. Lithium X, a small junior lithium company, was acquired for over $250 million only two years after going public.

I have had more meetings than I can count with companies trying to get me to buy into their lithium projects.

What You Need To Know About EV Batteries

An estimated 1.7 million new EVs will be sold globally in 2018. That's 40% more than in 2017.

Let that sharp rise sink in for a moment.

Again, Bloomberg Energy Finance forecasts 8 million EV sales by 2025… and over 45 million EV sales by 2035. That's extraordinary growth and extraordinary investment potential.

The good news is that you don't have to try to pick a winner from among the current automotive technology leaders. You can simply sell every EV manufacturer the material they must all use in huge quantities for decades into the future. Last month, we covered copper; the EV boom will mean a copper demand boom as well.

In this report, we cover the demand boom in the vital elements used to make EV batteries. Conventional gas-powered vehicles have fuel tanks.

EVs have batteries. Today's EV sales are only possible because of recent advancements in batteries. The same will be said about EV sales in the future.

This means that battery chemistry is incredibly important. Getting the right blend of metals to create efficient, long-lasting, and safe batteries is no easy task.

I am going to walk you through the demand and supply of each metal used in major electric vehicle battery chemistry.

For the most part, electric car batteries have one of three different chemical compositions. Two of the three, **NMC** (*Lithium-Nickel-Manganese-Cobalt*) and **NCA** (*Lithium-Nickel-Cobalt-Aluminum*), are composed of lithium, cobalt, and a few other trace metals such as manganese and iron.

The third battery is composed of lithium-iron-phosphate. While it is a cheaper option, it is quickly being phased out in favor of NCA and NMC batteries because they are far superior in energy density and efficiency.

The battery chemistries I am going to focus on are NMC and NCA. These are the two most common battery chemistries used by companies like Tesla and BYD (backed by billionaires such as Warren Buffett).

While the precise percentages of each metal may change, the basic chemical composition will not. I believe this is the case because Tesla, BYD, and others have invested billions of dollars into battery design. Factories are built to produce batteries with precise specifications and cannot be flipped to an entirely different battery chemistry overnight. Furthermore, the Chinese government has shifted its subsidy policies away from cheap, short-range batteries to more efficient, longer-range batteries such as NMC and NCA.

I believe NMC battery demand is severely underestimated.

Lithium Carbonate Explainer

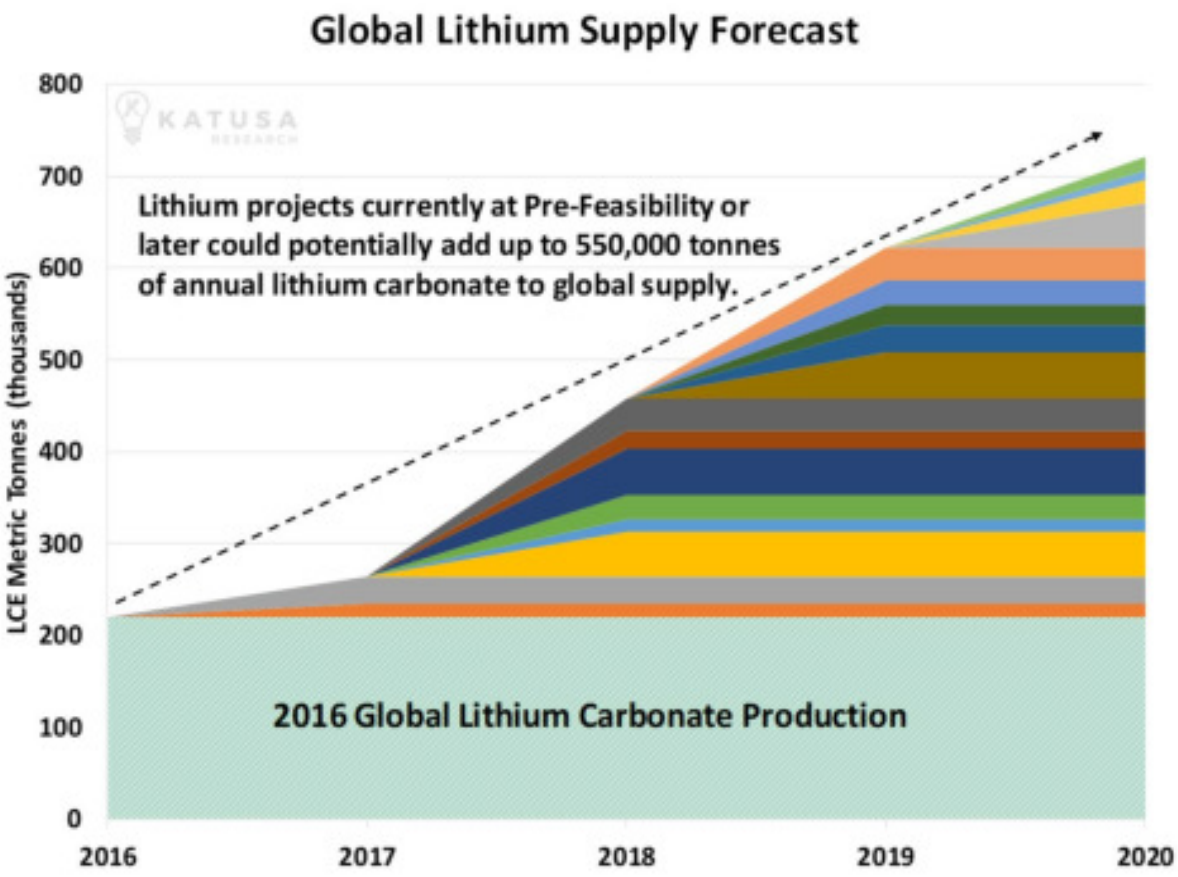
Virtually every electric vehicle on the road today is powered by some sort of lithium-ion battery. Unsurprisingly, lithium is a main ingredient in the lithium-ion battery.

Lithium is one of the most common elements on earth. In order to be useful to the battery sector, lithium must be converted to lithium carbonate for maximum energy efficiency and density. One pound of lithium produces 5.3 pounds of lithium carbonate.

Impressively, the price of the metal has risen from $3.50 per pound to over $10 per pound over the past two years. The reason is both a demand and a supply issue.

Before electric vehicles became mainstream, lithium carbonate demand was not particularly high. Roughly 110,000 tonnes (242 million pounds) are consumed each year by sources outside of the battery industry. The supply side was essentially built to handle a market of this size. So as the EV market has exploded in popularity over the past few years, miners have needed to bring additional production online to satisfy the demand.

Below is a chart that shows current lithium carbonate production, along with every mine that could realistically come online between now and 2020. Each colored bar represents a mine's annual lithium carbonate production (note that LCE = Lithium Carbonate Equivalent).



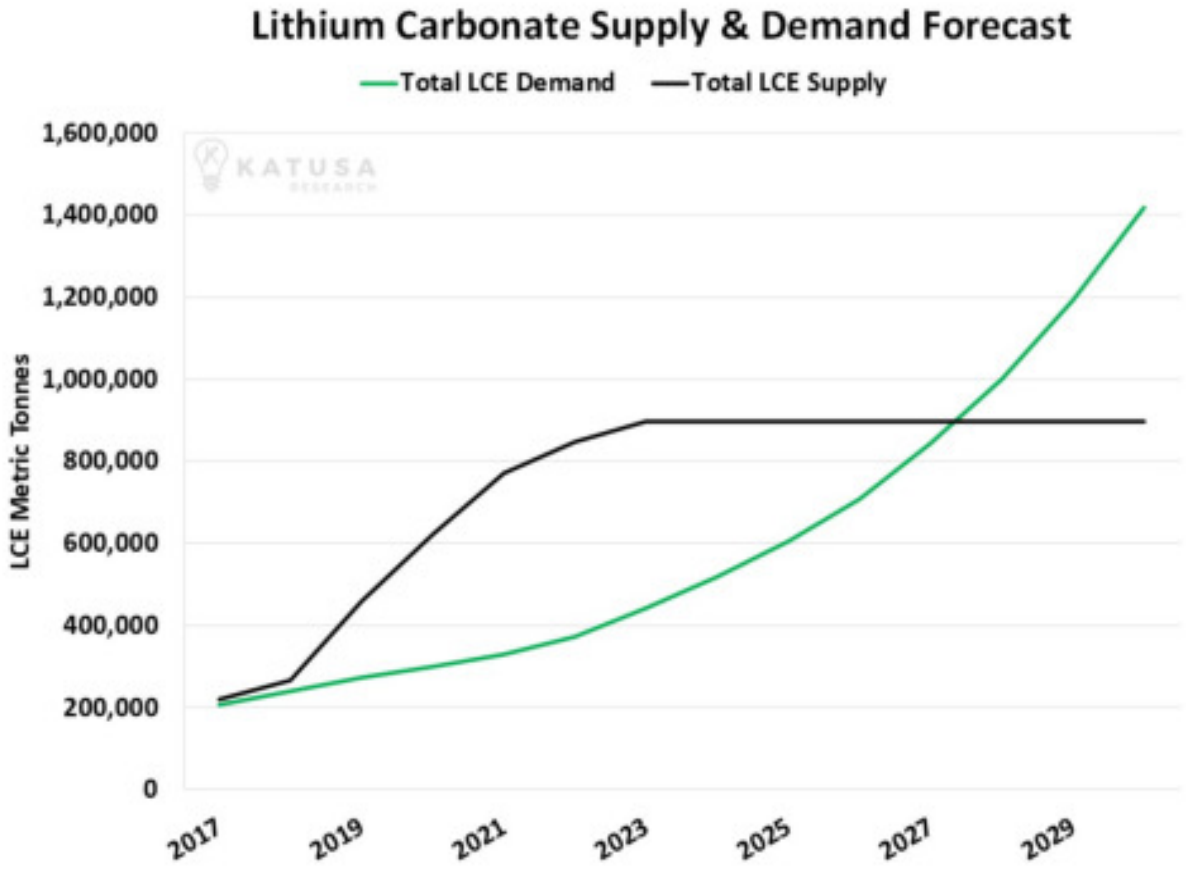
We can see from the chart above that lithium carbonate production has the potential to increase by 240% between 2016 and 2020.

That begs the question: What is lithium carbonate demand going to look like in 2020 and beyond?

To arrive at this answer, we will take our EV forecast and multiply the number of cars sold annually by the amount of lithium in each EV. Of course, each EV is going to be different. But the amount of lithium for each battery chemistry is not going to change drastically.

Conservatively, the math works out to 1.54 pounds of lithium carbonate per kWh in the battery pack. To put that into perspective, a standard 65 kWh battery pack in an NMC battery will require roughly 100 pounds of lithium carbonate.

Below is a chart that shows the demand and supply forecast for lithium carbonate through 2030.



As we can see in the chart above, the market is quite tight for lithium carbonate until 2019 and 2020. That is when many of the recently financed lithium projects will reach commercial production.

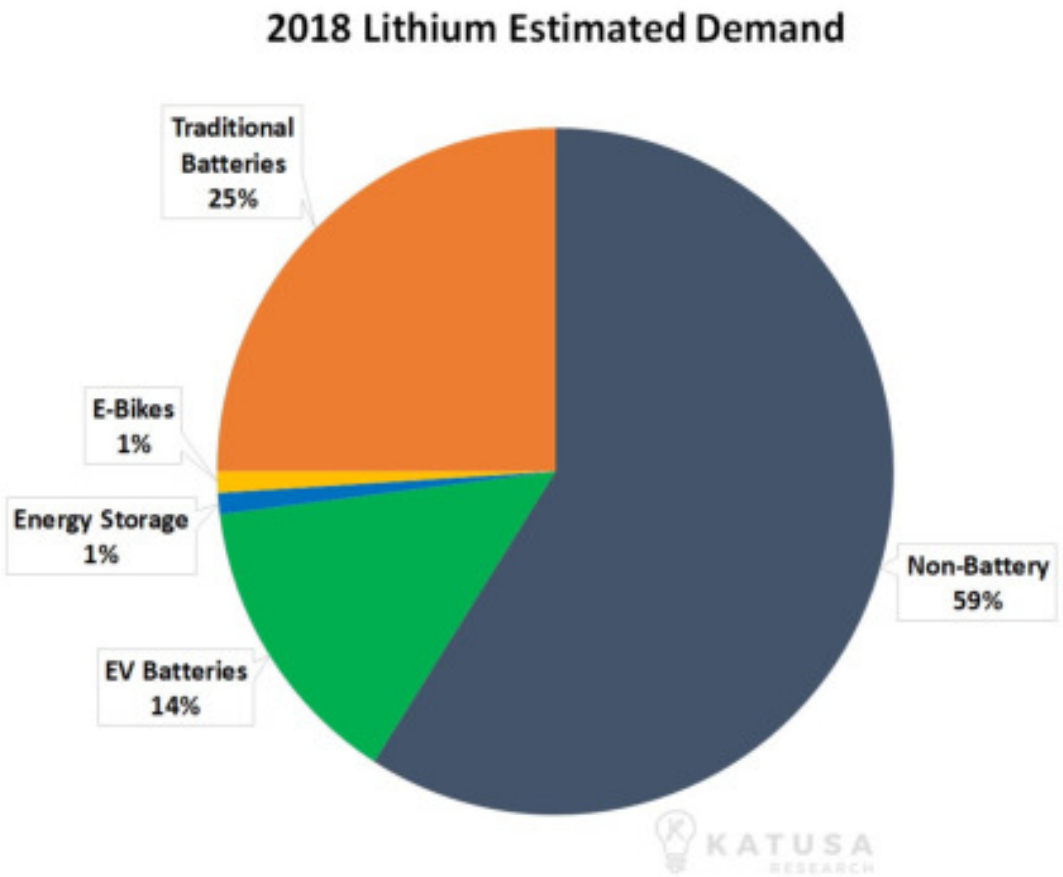
Lithium: Back to the Basics

Lithium is the lightest metal on the planet.

Because of that property, lithium is used to make lightweight alloy metals for high-speed rail, planes, and armored vehicles. Lithium is also used in lubricants, glass, ceramics – and famously, to treat depression.

Lithium is extremely abundant on earth.

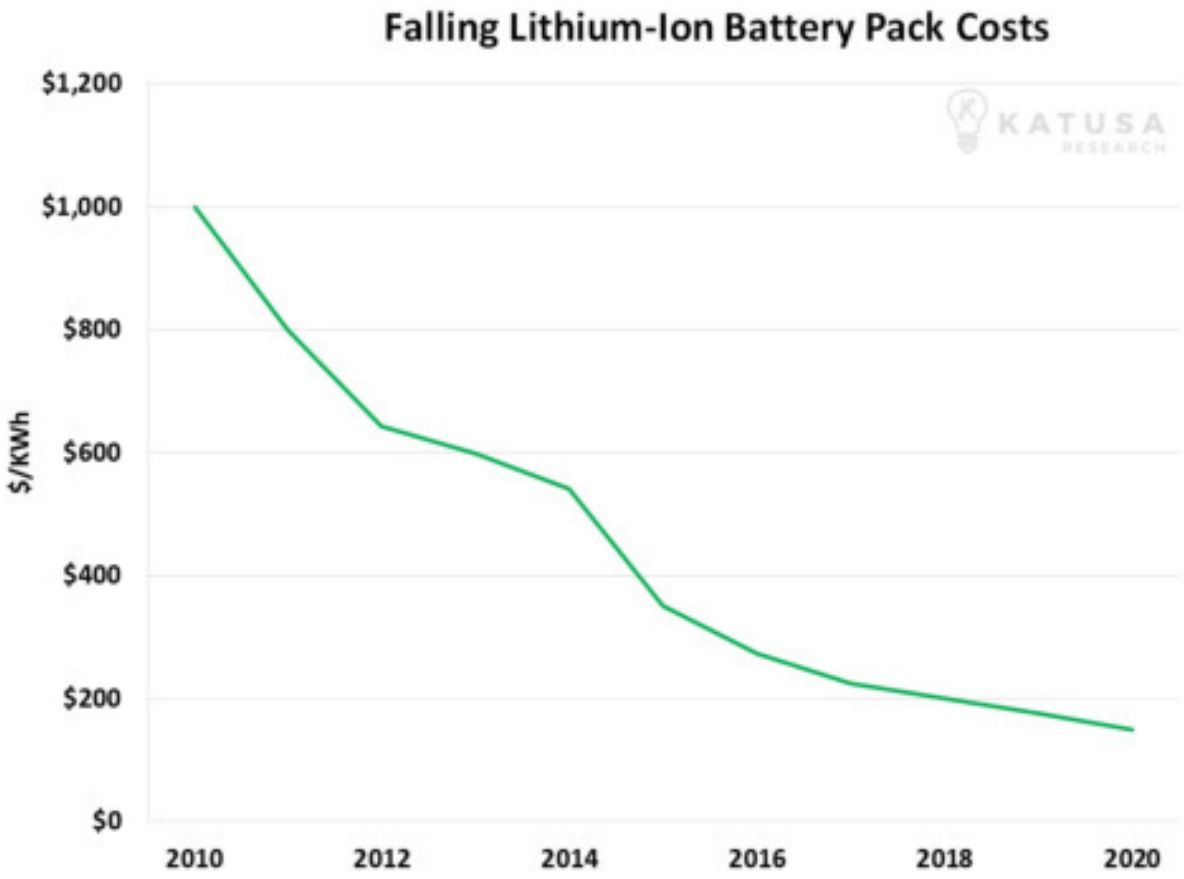
In 2016, 60% of all uses of lithium were for non-battery applications. The chart below shows the breakdown of estimated lithium demand by category in 2018.



The most important growth for lithium in the future will be for battery applications... specifically for electric vehicles.

There is no denying lithium's importance will increase moving forward due to the expected increase in the number of electric vehicles. A lot of people do not realize the effects of the drastic drop in the cost of lithium-ion batteries. This is very bullish for the future applications of lithium-ion batteries in electric vehicles.

The chart below shows how lithium-ion battery costs have plummeted from over $1,000 per kilowatt hour in 2010 to under $200 per kilowatt hour, for an 80% decrease in cost, in under six years; we expect the costs to drop even further due to technological advances. Tesla's CEO Elon Musk claims his company already produces batteries for under $200 per kilowatt hour.



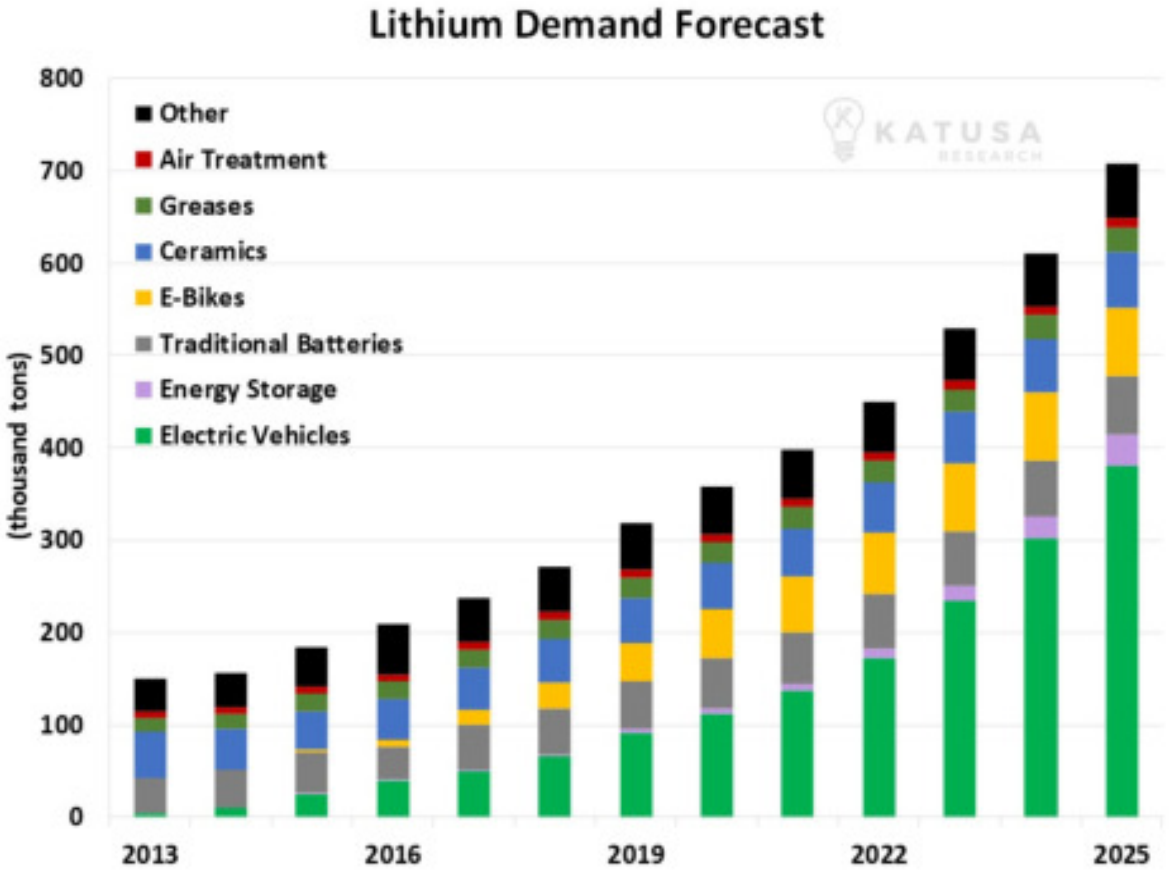
<u>If you do not believe in the electric vehicle revolution, save your time and stop reading now.</u>

The future of lithium is directly tied to the growth of the electric vehicle. Today, electric vehicles make up just 20% of the global demand for lithium. By 2030, lithium required for electric vehicles will represent more than three times the current global supply.

In 2017, China alone sold more electric vehicles than were sold globally in 2016.

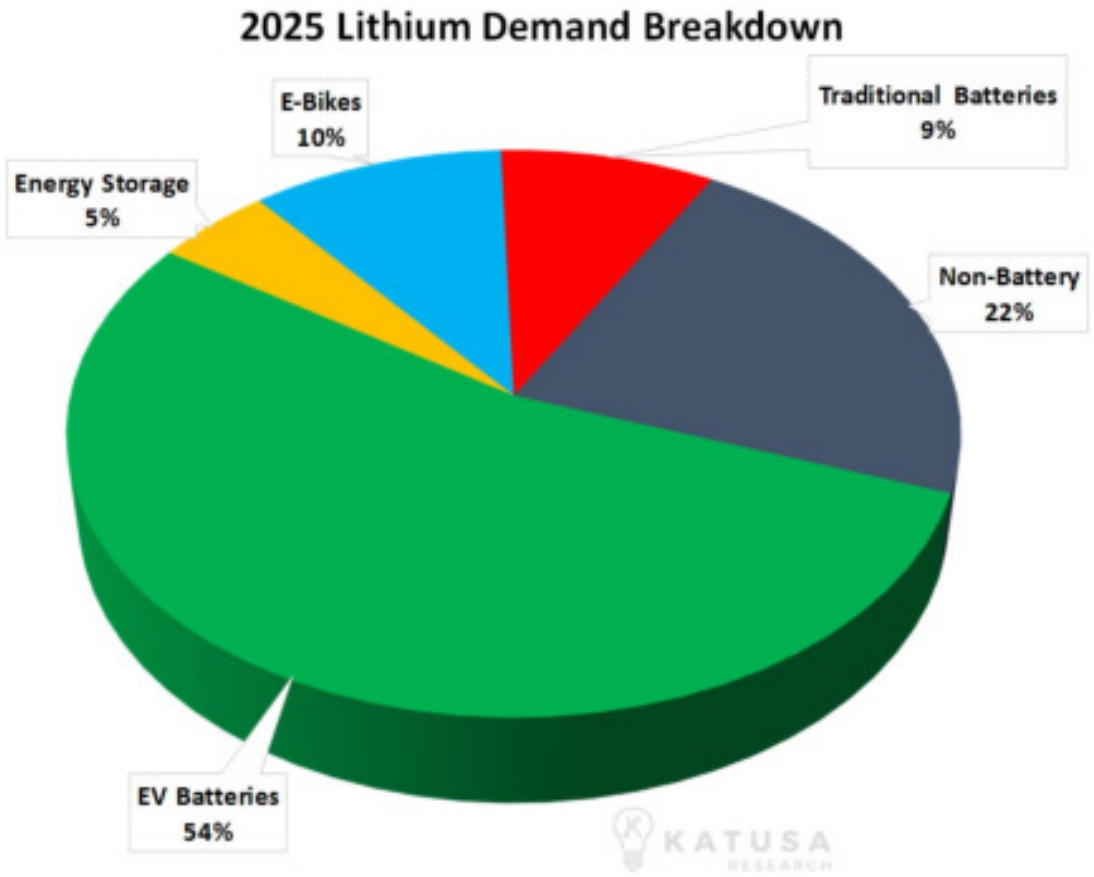
The demand for electric vehicles is real. We expect the demand will increase as more manufacturers design electric vehicles and the quality of electric cars increases.

Now, we'll get into our own internal estimates on the growth of the lithium demand for batteries in electric vehicles. As you can see in the chart below, the growth of lithium directly depends on the growth–both sales and adoption–of the electric vehicle (which can be seen in the green bar portion of the bar graph).



We expect that by 2025, electric vehicles will make up 54% of the global demand for lithium. There is no other metal in the world with such a clear and specific demand-growth outlook.

The pie chart below shows what the global demand for lithium per sector is expected to be in 2025. Non-battery application demand, which was 60% in 2015, makes up only 22% in 2025. The biggest expected growth is in the use for batteries in electric vehicles.



But that doesn't mean all lithium stocks are good speculations.

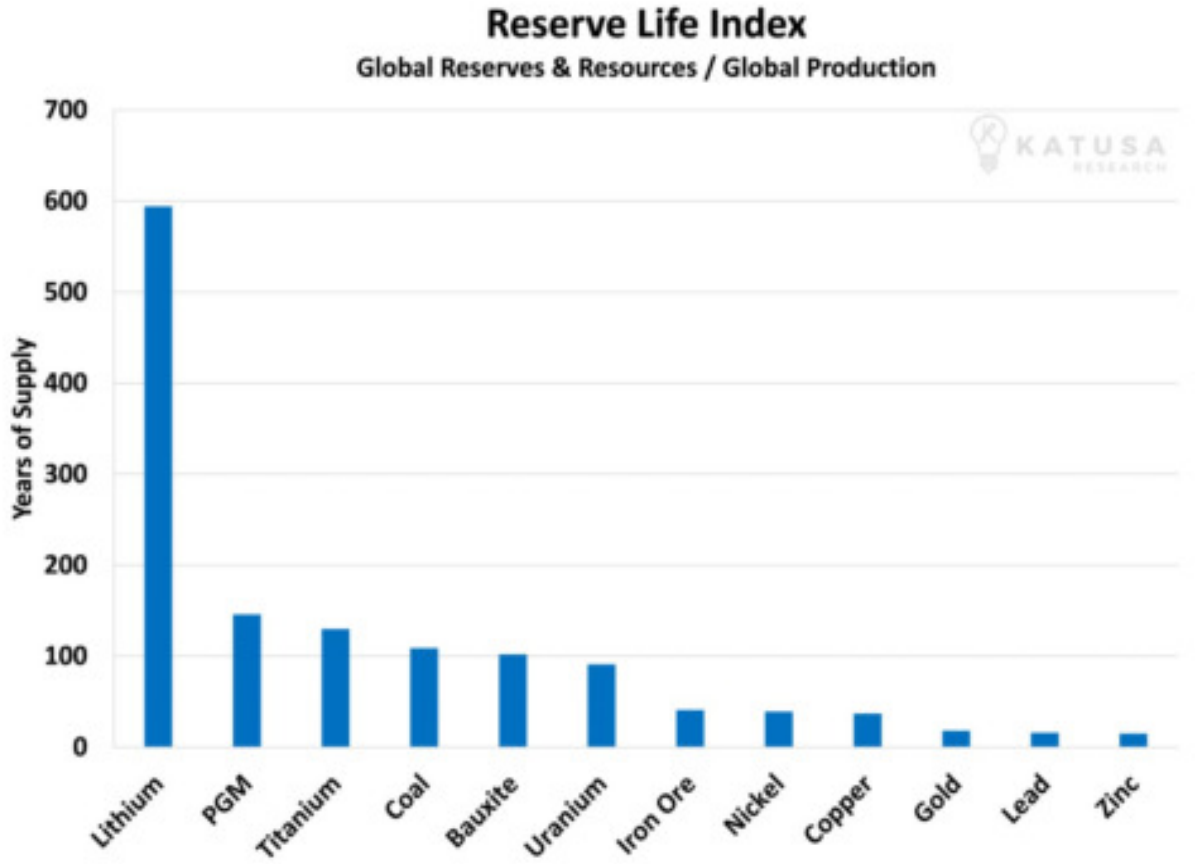
In fact, most are awful speculations.

Most lithium companies do not have lithium deposits that will ever be put into production. Thus, they are essentially worthless. The point of this report is to explain what it takes for a company to have a successful lithium project.

Before we get into project specifics, I want to provide the current status of the lithium sector as a whole.

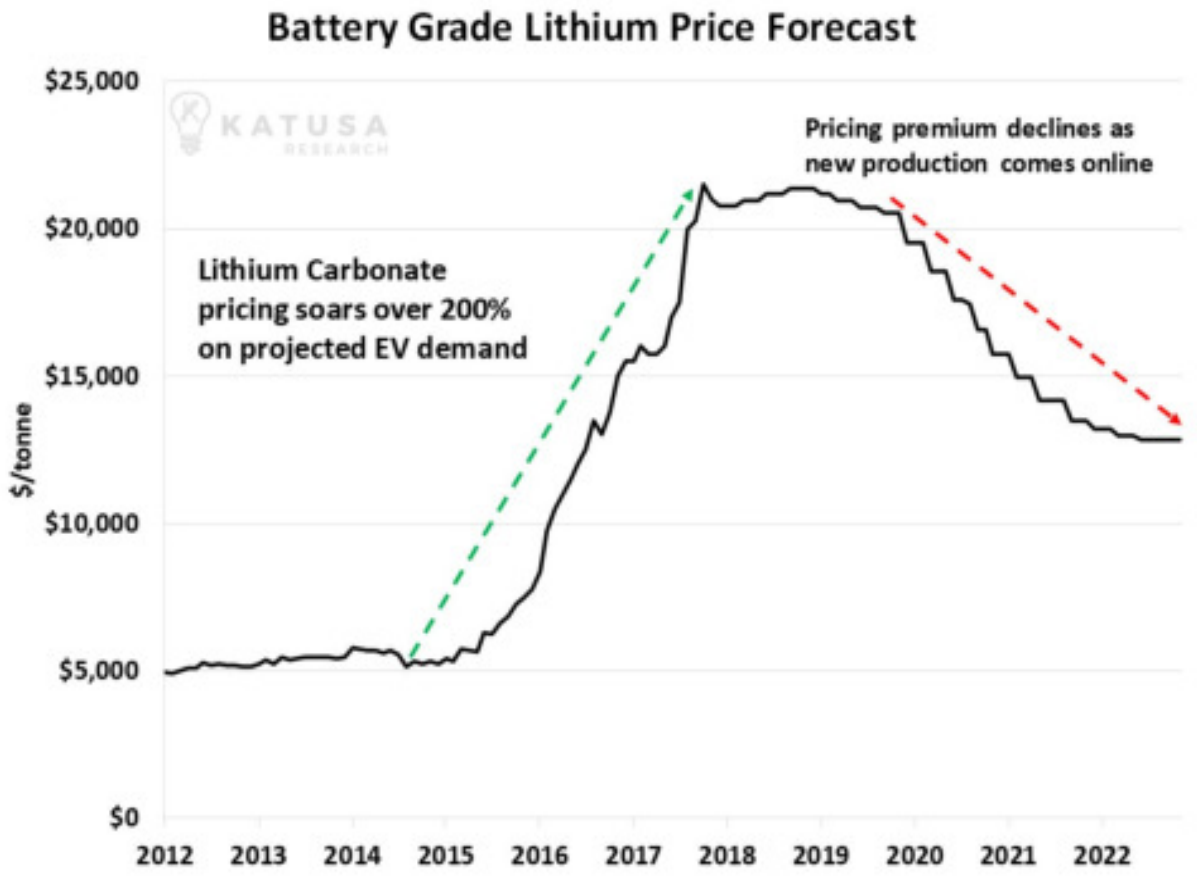
Lithium is in no shortage.

For example, there is so much lithium on earth that it dwarfs supplies of copper and gold. Currently, there is over 600 years of known lithium supply on the planet. The chart below shows various resources and the years of known supply we have of them. Lithium has the highest amount of reserve life of any metal on the planet in the ground (not above-ground stockpiles).



But the price of lithium has been on fire for the past 12 months. It has climbed in price because of a significant increase in battery-grade lithium demand, and refiners have been scrambling for above-ground supply.

The price performance of battery-grade lithium, which is 99.5% lithium carbonate, is below. It's one of the best performing metals in the world over the last 24 months. The price of Asian battery-grade lithium has soared from less than $10,000 per ton to more than $20,000 per ton.



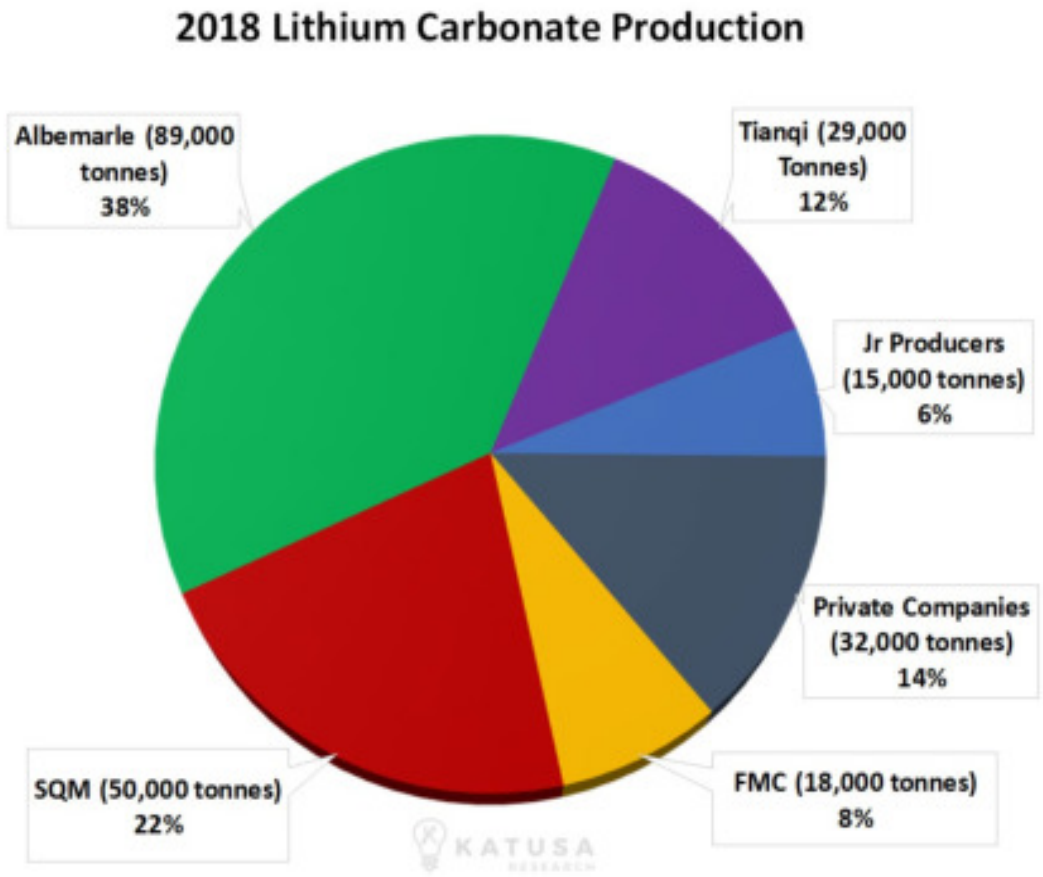
I do not believe the current high price for battery-grade lithium is here to stay. There is just too much supply in the ground available that is economic at current prices. We expect efficiencies and new expansion of existing projects and new top-tier projects to lower the current price for battery-grade lithium by at least 20%.

The only reason the price hasn't dropped yet is because it takes many years for a mine to put the metal into production. So there is a time lag to production.

The Big Four Lithium Monopoly

Four companies I call the Big Four – **SQM**, **Albemarle**, **FMC** and **Tianqi** – control nearly 80% of global lithium production.

The chart below shows how global production breaks down:



With high lithium prices, many new projects can come into production, or previously uneconomic mines get put back into production.

The Big Four shown above will not simply let new entrants into the market. When only four companies control 80% of the global supply of a specific metal's production, one can safely call that an oligopoly. Oligopolies come with different market characteristics.

So, one of three things can happen:

1. The Big Four will buy out any of the juniors that pose a real threat to their oligopoly.

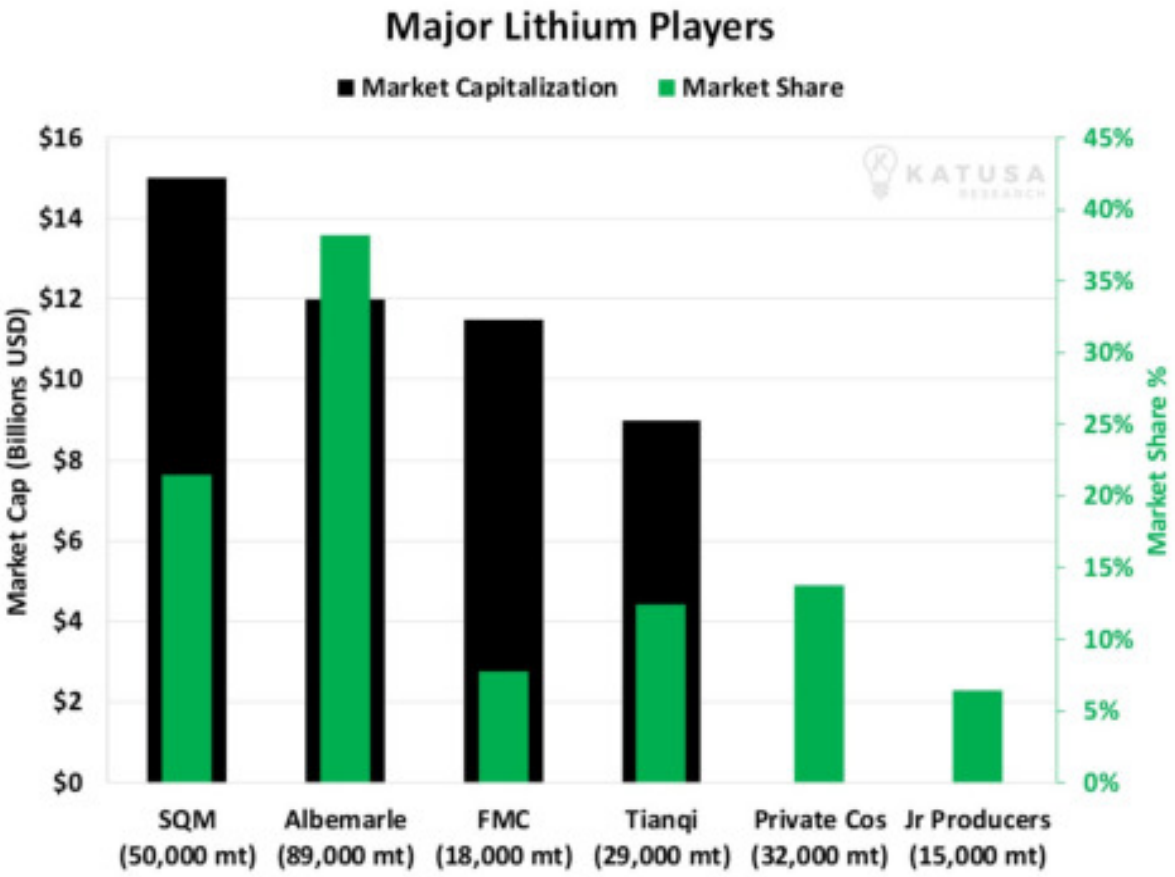
2. If given enough time, the Big Four will produce more lithium and the price of lithium will drop significantly. This will make it uneconomic to bring any new production online.

3. All of the top non-Big 4 lithium companies with near-term lithium projects will merge to create a competitor to the Big 4.

I've been in the resource industry for almost two decades – and I just don't see option 3 ever happening. That leaves only two options.

Also, the Big Four carry big market caps. Each one has a market cap over USD$5 billion. The Big Four have balance sheets capable of buying the biggest, highest grade, low impurity lithium deposits that any of the juniors can develop. And the Big Four know the lithium space better than anyone else. They will not buy anything other than the biggest, highest grade, low impurity lithium deposits.

The chart below shows the market share each of the Big Four lithium producers have in global lithium production and their market caps. Each of the Big Four lithium producers have big market caps, big balance sheets, and large, long-life lithium deposits.



In an oligopoly market, where just a few companies control such a large market share, two things usually happen. The Big Four will produce more lithium, and as a direct result, the price of battery-grade lithium will drop; **and** during that time lag of more lithium production coming online, the Big Four will buy out the juniors which have the best lithium deposits.

The Big Four will do this in order to maintain their oligopoly. In fact, we have already started to see this trend developing. Albemarle and SQM both indicated significant production increases over the next 3 to 5 years.

This all leads to my point... If you speculate in lithium, you want high-grade, large, low-impurity and low-cost production.

Here are the four most important factors you need to focus on for a lithium speculation.

1. Grade
2. Size
3. Impurity levels
4. Cost of production

Let me start with **cost of production.**

We have already established that there is no shortage of lithium. The companies that will win in the lithium space will be companies that are able to come to market quickly and with a low cost of production. You only want to be exposed to (own) stocks that will be the lowest cost lithium producers.

There are only three types of lithium deposits that have any real chance of going into production globally:

1. Salars,
2. Spodumene, and
3. Hard rock dseposits.

Don't even bother with low-grade hard rock lithium deposits.

Hard rock lithium deposits (in almost all cases for undeveloped projects) will be a high-cost producer. The cost to blast, crush, and extract the lithium out of the host rock cannot compete with the lower half cost of current lithium production.

Almost all of the hard rock lithium production comes from spodumene deposits because the lithium is much higher grade than other hard host rock. Many in the lithium exploration sector currently believe that they

can bring on new production from undeveloped spodumene deposits. That would be true if the price of battery-grade lithium stays high, but I do not believe that will be the case for the two main reasons mentioned above.

Another negative with hard rock deposits is that acid is almost always used to extract the lithium from the host rock. That makes the "green metal" pretty "un-green" quite quickly. And the cold hard truth is that the lithium grade and size of the lithium resource required to make a spodumene deposit economically comparable to a low-cost salar is very rare.

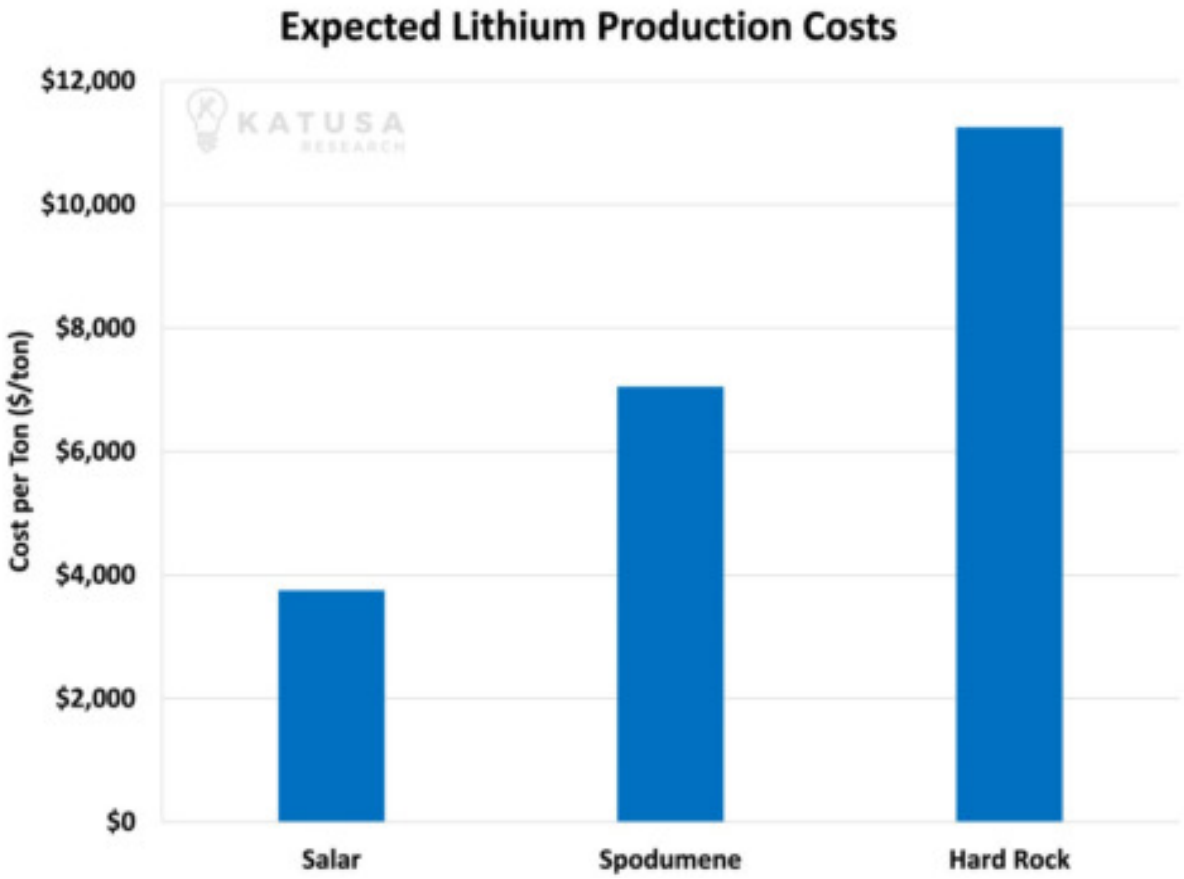
Not a single deposit owned by a junior will be in production for at least 3-5 years. It takes that long – in a best case scenario – to put a well-defined economic deposit into production. It usually takes longer. Perhaps there will be one or two spodumene deposits in Australia that can pull it off, but I'll leave that to the folks down under to figure out.

I want my money exposed to the lowest cost quartile of production in any metal, and in lithium that is lithium production from salars.

A lithium salar is a brine reservoir (think of a very salty lake) that is filled with hypersaline lithium bearing brine (salt water – not fresh water). There is no rock to blast, move, crush, or extract the lithium out of. The production process is about as simple as it can get. Basically, evaporation ponds are created from the salars, and the material left over is very high-concentrated lithium-bearing salts and other minerals.

The chart below shows the most likely cost of the three different types of lithium projects I have mentioned (low-grade hard rock, spodumene deposits, and lithium salars) moving forward.

For salars there are no crushers, ball mills, large trucks, or shovels. Because production of lithium concentrate from salars requires a fraction of the capital expenditures and much lower ongoing operational expenditures, salars have the lowest cost of production.



I want to only be exposed to the lowest cost, highest-grade biggest deposits with low impurity levels. That is why we will focus on lithium salars.

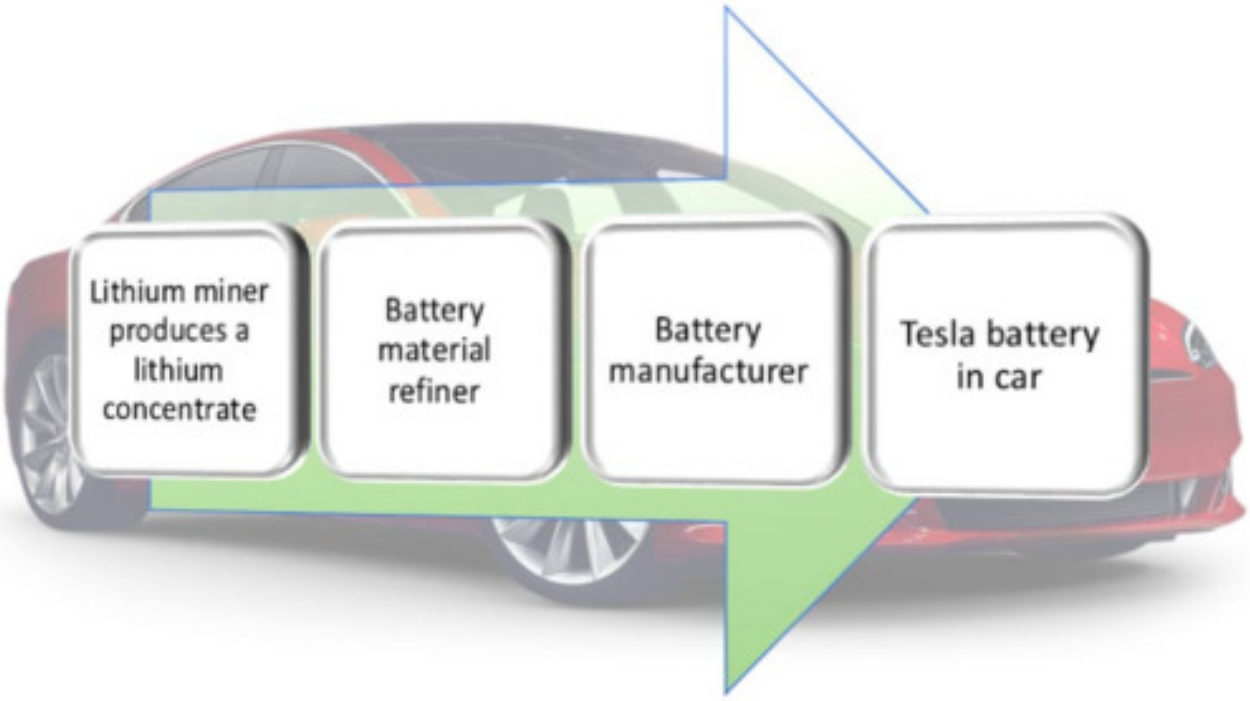
Pictured above is the Salar de Uyuni in Bolivia. It is the world's largest salt flat.

Keep in mind - NOT ALL SALARS are created equal

Here is the secret for salars: chemistry matters.

There are less than a dozen teams globally who have actually built and operated a lithium salar to produce a lithium concentrate that a battery manufacturer can turn into a Tesla battery.

Think of the production chain in these steps:



It's obvious that over the next few years, the winners in the lithium mining sector will be those who win the race to high-quality lithium concentrate.

And that takes us back to understanding the chemistry. This includes having a high-grade, low-impurity, low-cost operation, and most importantly, good people. You want the people who have the know-how to actually produce a quality brine that will be turned into the battery-grade lithium concentrate the manufacturers want.

Every brine has a unique chemistry (think of it as DNA). Each lithium salar has its own chemical compositional characteristics which will require its own unique process for lithium extraction. This is where the people become so critical; as stated earlier, there are less than a dozen teams globally that have the experience and know-how to tackle these processing issues.

To summarize, we want exposure only to lithium salars, with low impurities and a high grade, run by management teams that have actually put lithium mines into production, and that will be low-cost lithium concentrate producers.

Over my 15-year career, I've invested in just three lithium juniors.

The first two were both very big wins, returning over 1,000% each, and the third was a 200% gain.

I have a complete database of all the salars in Chile, Argentina, and Bolivia that I first compiled in late 2008 and have added to since.

The irony of the sector is that most of the companies are run by management teams who have no clue what chemistry will make a profitable lithium concentrate. Never mind them actually having the right salar. Actually, most management teams running a junior lithium explorer would not pass Chemistry 101.

Because of the very large price appreciation of battery-grade lithium, the lithium sector as a whole has attracted "*Johnny come lately*'s."

I call these people *rounders*, because they are always "around" and creating crappy new companies in whatever sector is hot at the time. Rounders are fly-by-night entrepreneurs who raise early seed capital from their supporters, then hire a bunch of geologists and grab some very early stage projects that are located in "promising" areas, also known in the industry as an "area play". These assets are almost always crappy, but they are touted as the answer to Tesla's future lithium needs. The rounders sell stock to the unsuspecting public after it has been promoted.

When uranium was hot in early 2006, these rounders made up the majority of the 1,000+ exploration companies in 2007.

When rare earth metals were hot in 2010, they were around en masse in 2011.

When graphite was hot in 2011, they were around.

And they are now doing the same for lithium. There are now literally hundreds of lithium exploration companies, both public and private.

Be aware of the rounders. Some may mean well, but the reality is they don't have the technical ability, know-how, or financial endurance to create a low-cost producer or a resource package that one of the Big Four will want to buy out.

The lithium sector is currently full of promotion, excitement, and expectations, and a lot of that has to do with Tesla and Elon Musk.

I've seen this before. Been there, done that.

I can confidently say that you do not want to own most of the companies currently in the lithium sector. That said, there will be a few winners in the sector. I do not view a "winner" as a stock promotion that doubles or triples. The next 3-5 years will prove that the real winners will be those who win the race to production with a high-quality, low-cost lithium concentrate.

Lithium Demand and Rising Sales in Electric Vehicles - Did you see what BYD did in 2017?

Most investors aren't familiar with BYD, but it might be the biggest, most important company you've never heard of.

During the month of September, shares of BYD soared 55%... making one of the world's most valuable companies a lot more valuable.

You may not be familiar with BYD, but legendary investor Warren Buffett is. Through his holding company, Berkshire Hathaway, Buffett owns a huge portion of BYD. He bought the stake in 2008.

BYD, a Chinese company, is the world's largest maker of electric vehicles. China is the world's largest market for electric vehicles – and it keeps getting bigger.

Buffett and other well-informed investors have known about BYD and its great potential for many years. But on September 11, 2017, BYD's already huge potential to increase shareholder wealth got a lot bigger.

On that day, as the mainstream media focused on hurricanes and Donald Trump's immigration policies, China announced its plans to ban the sale of fossil-fuel powered cars and trucks. No target date was given, but China made it clear that electric vehicles (EVs) are the future of the world's largest car market (which is about 35% larger than the U.S. market).

China is desperate to clean up its infamous air pollution, which sickens and kills its citizens. Emission-free EVs will play a huge role in the efforts. The announcement was a shot heard 'round the automotive world, and it put rocket boosters on BYD shares. Again, the stock gained 55% during the month.

China is such a huge, powerful player in the global economy that when it makes a major economic change, it's like Apple making a major change to the iPhone. It causes ripple effects around the world for years in the future. The news from China tells me that mass global adoption of EVs will occur faster than most people believe. Thanks to incredible advances in technology, massive corporate investment in the sector, and huge government support, sales of EVs are set to boom for decades.

So Marin, Where Are You Putting Your Money?

All the research I've done tells me that if you are a lithium explorer without a resource, it's going to be tough to break into the market. My basic conclusion is to stay away from early-stage projects that will not threaten the existing dominant producers.

Furthermore, with ample supply in the medium term, I believe it is unlikely we will see a big ramp up in lithium prices above recent all-time highs. Visibility for mines coming into production past 2021 is very cloudy. Trying to figure out when mines are coming into production that far in the future involves too many variables, and I would just be guessing. Regardless, there is ample lithium supply in the interim, especially from existing large miners getting amendments to their permits to increase production.

I believe the lithium market has already begun to mature. Many of the main projects will be coming online within the next decade. Investing in the sector is now more of a trend-following investment, rather than a new sector with explosive growth.

I believe lithium producers will do well, and I have my eye on three juniors that I believe will be take out candidates. But until the price puts the odds of success in our favour, I will stay on the sidelines. Once the price is right, I will send out an alert to all subscribers.

As promising as the lithium sector is, there are better ways to play the EV metal sector.

The copper sector has a much better market dynamic for investors over the next decade, and I am investing millions into the copper sector. Copper will be a big beneficiary of the EV revolution.

Every month, I reveal all the stocks I'm putting millions of dollars of my own money into exclusively to the subscribers of *Katusa's Resource Opportunities*. To find out which lithium and copper stocks I own and see soaring 300% or more in the future – click here to learn more.

Regards,

Marin Katusa

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