



**FMC Corporation**  
**FMC Corp. Presentation at BMO Metals and Mining**  
**Conference**

**February 27, 2018**

*As Prepared for Delivery*

Paul Graves, Executive Vice President and Chief Financial Officer

Good morning and thank you for having FMC here today and allowing us to give a short presentation on FMC Lithium.

Before we begin, let me remind you that today's discussion will include forward-looking statements that are subject to various risks and uncertainties concerning specific factors, including but not limited to those factors identified in our release and in our filings with the SEC. Information presented represents our best judgment based on today's information. Actual results may vary based upon these risks and uncertainties.

Today's slide presentation is available on our website. With me is Tom Schneberger, Vice President of our Lithium business, and he will join me for the Q &A at the end of this presentation.

Today, I will focus on FMC's views of the Lithium industry, specifically from the perspective of FMC's place in the value chain. Our industry is gaining lots of attention today, driven by the rapid increase in demand from the growth in batteries for EV applications which has driven prices higher and generated a lot of focus on new supply that is being targeted to come to market. However, what seems to be increasingly lost in the discussion around the RISK of oversupply is a more nuanced conversation about exactly what will be demanded of lithium producers, and who will ultimately succeed in this rapidly evolving landscape. Increasing spodumene mining output and lithium carbonate production capacity are important elements of future growth for our industry as a whole. But it will be the evolution of the role of the lithium producers as providers of value over and above just the lithium content that will drive the development of the industry over the next decade.

So, let me start with the conclusions.

First, not all “lithium” is created equal. Producing lithium in the form and with the characteristics necessary to be processed into future lithium ion batteries, whether that is high-nickel content or even solid state, is perhaps the least analyzed and understood challenge amongst the industry watchers today. Simply increasing output of spodumene at the mine will ultimately not be enough to meet the customers’ needs.

Second, the key focus of forecasting models today should be demand, not supply, as many analysts are underestimating the surge in demand for lithium that is coming in the next decade. The launch dates, the range and therefore implied battery pack size, and the battery technology all need to be considered in translating EV demand to lithium demand. The assumptions you make about vehicle penetration rates, battery types, and average range, plus how the battery technology race develops, are all important factors in assessing what EV demand means for lithium demand. And we understand that due to the competitive value inherent in some of these decisions, neither OEMs or battery producers share much this information externally. However, based on our conversations with our customers, FMC believes there is more variability to this side of the forecasting equation than there is to the supply forecasting.

And third, when we DO look at the supply equation, it is critical to understand that nameplate capacity does NOT equal effective capacity, and effective capacity does NOT equal production. You only have to look at the data for 2017, where our industry was producing flat out and selling every kilo it could produce, to see that there is more to supply side models than just theoretical capacities. It is vital to understand this when building supply curves based on public announcements about targeted nameplate capacity. I will touch on our track record as an industry, and I include FMC in that, when it comes to building and operating lithium production facilities.

So let me start with FMC's views on the first two points, demand and the nature of demand.

Slide 4 is an illustration of a key trend that our industry is watching. It shows how some of the larger OEMs are developing their EV fleets based upon the cathode technology they expect to deploy. This data is drawn from public data in the first instance, but enhanced by our own conversations with the value chain of our customers, that is both OEMs and cathode material producers. What it shows is that as OEMs look to meet the range

demands of both regulators and consumers they will increasingly need to migrate to batteries with higher energy density – highlighted by a shift of color from blue to red on this chart – and to do that they will likely be increasing the ratio of nickel to the other inputs into the cathode. The reason this is important brings us back to a comment I made earlier; as this move takes place, it will no longer be possible to use carbonate in the manufacturing process of the highest nickel content batteries. While the intermediate step, that is NMC 622, can use either carbonate or hydroxide, FMC test data show that using hydroxide can significantly improve the performance of the cathode compared to using carbonate. But for 811, or NCA, which is also a higher nickel content, high energy density technology, producers will need to use lithium hydroxide in their processes. As an aside, this trend to higher energy-density batteries and longer-range vehicles has only been enhanced by recent changes to China subsidy structures, which were specifically designed to accelerate this trend in order to further accelerate consumer adoption of EVs in the China market.

The next slide shows how we build up our own view as to EV penetration in each of 2020 and 2025. Built model by model, and cross referenced to direct conversations with customers and auto

makers, it builds to an implied penetration rate of sales of EVs to 12% by 2025. The sheer number of slices of these bars shows you that this is not based on the claims of any one manufacturer but is very broadly based. Some of the manufacturers referenced here have announced fleets that have more than 50 individual models by 2025. To compare, according to BMO's own research published last week, the average 2025 estimated penetration rate for EVs made by the auto industry itself is 14.3%. And there is no doubt that China will continue to be at the core of EV growth into the foreseeable future, with almost half of all EVs being sold in China by 2025. FMC has, for many years, used this methodology and we have consistently seen that our forecasts have proved to be more conservative than aggressive.

On the next slide, you can see the impact EVs will have on the lithium industry in the coming years. By combining the vehicle forecasts with the estimates of battery power included in each vehicle, we can estimate how much lithium will be needed. You can see that lithium for batteries for pure EVs represents a fraction of the market today, and remains well less than half of the demand in LCE terms by 2020; but by 2025 it represents over two thirds of demand for lithium, and growing. It is this growth that

presents our industry's biggest opportunity and its biggest challenge.

This analysis becomes more meaningful when we combine the analysis with our first data point, that is the expected cathode technologies; ultimately, our job as lithium compound suppliers is to make sure that we can produce the right form of lithium to match this growth. To that end, we look at the cathode chemistry and forecast in what form our customers will require the lithium. Basically, we assume that all NCA and NMC 811 cathodes will require hydroxide, and that an increasing share of NMC 622 manufacturing will be designed to use hydroxide in the process. And of course there will remain many battery applications where LCO, LFP and other lower energy density battery technologies are adequate for the applications they are used in. This will ensure that lithium carbonate demand will also continue to grow, regardless of the shift towards hydroxide in newer applications. This allows us to create an estimated demand for both hydroxide and carbonate in 2020 and 2025. You can see how the rapid shift to high nickel cathodes drives a rapid growth in demand for hydroxide, from 50,000 tons per year today, doubling by 2020 and increasing 8-fold by 2025. I will discuss FMC's role in this growth shortly.

As I mentioned at the outset, it is the demand side of the story that investors should primarily focus on, rather than the supply side. And that analysis needs to go beyond simply measuring what total LCEs will be needed, but in what form. The same goes for the supply side analysis, so let me move onto that now. You can see with these yellow diamonds what we think effective supply side capacity will be in each year, and let me move onto that in more detail now.

I am going to show you the cost curve for 2017, 2020 and 2025, per FMCs analysis. I will overlay our best estimate of the carbonate pricing today, ex-China spot. Our industry is plagued with what I might loosely call “false indicators”; perhaps the two biggest are the LCE myth, in that an LCE doesn’t actually exist and cannot be produced, sold or used; and the second is the idea that there is a spot market for carbonate that is driving commercial decisions in our industry. While we are not large players in the sale of carbonate, we are one of the world’s largest consumers of carbonate, and therefore monitor pricing very carefully. The prices publicized by our competitors as their realized price, plus those quoted by independent market observers such as Benchmark Minerals, indicate a price range of



between \$11 and \$14 for carbonate in most markets today. I accept that you see spot prices of carbonate in China that are higher, and more volatile, than this, but I would describe them as the by-product of short-term, localized supply-demand imbalances, especially in spodumene conversion capabilities, and would confidently state that they are irrelevant for commercial contracting decisions or investment decisions, or indeed for forecasting the financial performance of FMC Lithium.

2017 was a market that was by all measures, sold out. Whatever we as an industry could produce, we could sell. And yet a classic cost curve would suggest that there was spare capacity in the industry. This reflects the fact that very few lithium operations are able to run consistently above 85% of their effective capacity for long periods of time. When you account for this utilization rate, the industry was short supply. We roll our estimates of supply forward to 2020 in the same way that we analyze demand – on a project by project basis, using public data, data from our own internal technical analyses and from discussions with our customers. FMC believes that the market conditions we see today will remain in place through 2020, leading to a pricing environment that is not materially different from today. Again, our discussions with our customers, and the contract terms we are

entering into with them, suggests to us that we are not alone in this view. Finally, looking out to 2025, we see a market that is increasingly tight.

You should not underestimate the challenges in bringing on new lithium carbonate capacity; almost without exception, new projects are delayed by years, not months; capital costs increase significantly; and final unit operating costs increase dramatically. We recognize that expanding existing capacity is less risky and more predictable, and therefore less likely to be significantly different than publicly represented, but there is just not enough capacity in all of these expansion projects to meet even the most cautious of demand projections. In our view, there is very little our industry can do between now and 2025 to move this supply curve, other than bring on supply that is uneconomic at current prices.

I have heard many times the commodity-analysts favorite phrase, that rising demand creates increased supply; I would suggest that in our industry, at least in the next decade, we need to add rising prices to that formula if it is going to hold true.

So how does FMC intend to address these industry-wide challenges and opportunities? First, FMC has gradually moved

from a business dominated by BuLi and carbonate in 2014, to one dominated by BuLi and hydroxide in 2018, with only around 5% of our sales being in the form of carbonate. Looking forward, we expect the trend of an increasing share of revenue coming from hydroxide to continue; we are committed to expanding our hydroxide capacity at the same pace as customer demand, and we are equally committed to expanding our captive lithium carbonate production to supply our own lithium hydroxide production units.

We are working very closely with our current customers, as well as many new ones, to align their demand expectations as far out as 2022 and 2023 with our own production assets. We believe that we have an obligation to ensure that our customers have the lithium hydroxide they need to deliver their own commitments. FMC Lithium and its customers both see our relationship as one of partners, not just suppliers and customers. For example, we have committed to expand capacity in the coming years as our customers have made the commitment to FMC as to their purchase requirements. It is this philosophy that is driving our capacity expansion decisions. We seem to have done a good job of confusing many of our investors with the exact details of our

expansion plans, so let me just walk you through exactly what our plans are between now and 2025.

At the top of slide 14 we have our carbonate expansion plans, and at the bottom are our hydroxide plans. You will note that our current position of being marginally net-long carbonate at all times is one that we intend to maintain in the future, with our carbonate and hydroxide expansion plans largely aligned. However, we reserve the right to accelerate our hydroxide plans, even if that means being net-short carbonate, if our customers demand this of us.

Our carbonate expansion will consume the bulk of our capital, with up to \$300 million of capital invested in the first 20,000-ton expansion, most of which will be invested in the 2019 to 2021 timeframe. We expect to see the capacity come online in 10,000-ton increments, with the first increase occurring by the end of 2020 and the second increase by the end of 2022. Our engineering work for the first 20,000-ton expansion is well advanced, and we will begin construction later this year. The second expansion phase will add a further 20,000 tons by the end of 2025, again in two 10,000-ton increments. We are at an earlier stage of the engineering process, however our initial review of

critical infrastructure requirements has shown that we are able to deliver a second phase expansion on this timeline, for a similar cost as the first phase.

Hydroxide expansion is an area that we believe is a significant competitive advantage for FMC. To recap our expansions so far; we added 8,000-ton nameplate capacity of battery grade hydroxide in 2017, nearly doubling our capacity. However, what you should note about this is how we did it. First, the total capital spend was around \$10 million in total for these two units.

Second, the time from commencing construction to commission was around 9 months; and based on our track record and close customer relationships, we were able to significantly shorten the typical 12-18 month qualification period for product. We do not believe any other hydroxide producer in the world can increase capacity AND sales of battery-grade hydroxide in anything close to this speed or for this cost.

Looking at 2018 and beyond, we have commenced construction of another 4,000-ton line in China that we expect to be operating commercially before the end of this year, and are about to commence construction of a similar unit at Bessemer City in the U.S., which we expect to come on line in mid-2019. Finally, we

are committed to commencing construction of a third 4,000-ton unit, either in China or in the U.S., which will also be operating commercially by the end of 2019. We therefore expect to have total battery-grade hydroxide capacity of approximately 30,000 tons by 2020.

We will continue our progress in adding hydroxide capacity at the same rate as market growth. FMC's unique, modular approach to adding hydroxide capacity allows us to move quickly and in small or large increments across multiple geographic locations.

Importantly, we can time our expansions to match our customer contract profile, while continuing to produce consistent quality and specifications from all our units, wherever located.

Turning to slide 15 and the key drivers for growth in 2018 and beyond, which we showed in our earnings presentation two weeks ago. I will highlight a few key points. We expect global demand for lithium to grow at over 20 percent per year through 2025. We believe supply from high-cost spodumene producers will continue to be needed to meet end-market demand in every year through at least 2025. We expect this will create a price floor for lithium carbonate of low double-digit dollars per kilogram for at least the next 7 years.

In 2018, we expect full-year revenue for Lithium to be in a range of \$420 to \$460 million and full-year EBITDA to be in a range of \$180 to \$200 million. We expect price/mix and incremental volumes to each contribute approximately half of the increase in earnings. Prices will be higher year-over-year, across all our product categories. The majority of our 2018 forecast revenue falls under multi-year contracts with defined pricing. We see this trend of customers looking for longer-term supply commitments continuing – especially in hydroxide – reflecting customers’ general view that supply will remain tight into the foreseeable future.

Beyond 2018, we expect to retain our leadership in specialty lithium products and maintain our market share in the hydroxide market. Both of these objectives will require us to forge ever-closer relationships with our customers and to continue to invest in technology to support our customers’ needs.

We will invest in technology capabilities that allow us to add value to our customers’ manufacturing processes. And we will also continue to invest in areas such as butyllithium, metals and alloys

such that we retain the ability to supply whatever form of lithium the market demands.

Hopefully I have brought greater clarity to how FMC views the market, and therefore why we are pursuing this strategy.

Ultimately, we believe that the dynamics of lithium growth we are seeing leaves room for many different investment approaches, and that most industry participants will focus on the strengths of their own asset base in determining how they focus their resources. It is this philosophy, of investing in your competitive strengths, that gives us so much confidence in FMC's performance in the coming decade. With that I will stop and open the floor for questions.