

**Battery Metals Index**  
July 4, 2017- August. 28, 2017

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## Lithium, Cobalt Stocks Climb Despite a Potential Lithium-Ion Battery Challenger

Both lithium and cobalt companies in the Ubika Battery Metals index have gained 11% since our last reported dated July 4th, 2017. This compares to the TSX-V, which remained virtually unchanged over the same period. Both lithium and cobalt stocks have likely risen due to institutional funds flowing into lithium/cobalt companies following sustained investor sentiment about the bright future for electric vehicles. This report is highlighted by a discussion of the alkaline battery, which tech industry veteran Bill Joy thinks can replace the lithium-ion battery, as well as discussion of three companies that have seen their stock price move the most since our last report: Lithium Americas Corp (TSX: LAC), Lundin Mining (TSX: LUN), and FMC Corp (NYSE: FMC).

### Industry Highlights

- **Business Insider** reported that **Ionic Materials unveiled a battery that could challenge Lithium-Ion**. Bill Joy, Sun Microsystems co-founder and backer of Ionic Materials unveiled a solid-state alkaline battery that he claims will be cheaper and safer than the lithium-ion battery. Alkaline batteries are made of mostly zinc and manganese, with possible applications being consumer electronics, electric cars, and energy storage for the power grid. He stated the batteries will be rechargeable and ready for commercial use in five years.
- **Peter Tertzakin, Chief Energy Economist and Managing Director at ARC Financial Corp**, wrote an article for [oilprice.com](#) stating the electric car industry faces a **looming supply shortage**. Tertzakin states he is a believer that lithium-ion batteries still power the majority of cars in the future, but the number of electronic vehicles may cause some issues. He stated that 15 thousand cell phone batteries are needed to make one battery for an 80kWh electric car, so ramping up raw material inputs to build millions of car batteries a year may cause some scalability issues. He states that many raw material supply chains for larger-scale batteries are immature relative to the potential market pull, and that battery powered cars are coming to market faster than back-end resource industries needed to supply them, thus causing a supply/demand imbalance.

- A [report](#) from *Reuters* details that institutional investors have been putting money into cobalt companies. Institutional investors looking to gain exposure to the burgeoning electric car market have done so by investing in cobalt, a key component in lithium-ion batteries. Prices for cobalt have increased 83% this year on forecasts that demand will double in the next decade due to the emergence of the electric vehicle. In May, UBS said it expects ownership of electric vehicles to account for 3.1% of global car sales in 2021, and 13.7% in 2025.
- Cobalt listings have [surged](#) over the past two years. At the end of July, 110 companies mining or exploring cobalt were on the TSX and TSX-V, compared to less than 30 in 2015. Reuters reported that at least two more cobalt explorers with Ontario projects are planning listings on the TSX in coming months.

## Notable Performers

### Lithium Americas Corp (TSX: LAC)

Lithium Americas Corp is a resource company focused on advancing two lithium projects, the Cauchari-Olaroz project (through its 50% interest in Minera Exar), located in Jujury, Argentina, and the Lithium Nevada project, located in north-western Nevada. The Company also manufactures and sells organoclay products. The Company's stock price has increased 38% since our last report due to a positive update on the Cauchari-Olaroz project.

On July 5th, the Company gave an update on the Cauchari-Olaroz project. Lithium Americas reported that senior executives from all parties with an interest in the project attended a meeting in Buenos Aires with government officials from Argentina, where all parties reaffirmed their commitment to support the development of Cauchari-Olaroz. Furthermore, the Company reported that Minera Exar is progressing with early construction activities and targeting a timeline of being in production by 2019.

Further highlights from the update are as follows:

Figure 1: Cauchari-Olaroz Project Update

#### Project Update:

- **Increased activity at site.** Development activity currently ongoing includes: the campsite construction, additional hydrological tests, drilling campaigns and testing pond liner materials at site.
- **Engineering and procurement on-going.** We are developing the detailed design as well as working with the evaluation of the first construction packages.
- **Development schedule remains on track.** The construction of the first stage of 25,000 tonnes per annum of lithium carbonate production capacity is expected to be completed in 2019.
- **Strong support from Argentine government.** The Environmental Impacts Report for Exploitation ("EIS") issued in 2012 is in the process of being updated. In March 2017, the provincial government of Jujuy reaffirmed in a letter that the EIS issued in 2012 is still valid and states that "... construction may commence on the necessary infrastructure approved in this permit, without prejudice to future adaptations and updates that the mining operator performs with respect to the mining project, which are subject to the analysis of this authority."
- **Over 100 employees in Argentina.** Minera Exar currently employs over 100 personnel in Argentina with recruiting for additional staff and executives ongoing. Total direct employment during the two-year construction period is expected to total over 1,000 people.

Source: Company Filings

After the project update, Lithium Americas gave an update on the state of the project's financing. The Company raised US\$112mm from Gangfeng Lithium in early June to help fund their share of the project. More recently, Lithium Americas completed a second round of financing, raising US\$112mm from BCP Innovation Pte. Both financing are comprised of debt and equity investments. The Company's CEO believes that financing the rest of the project is likely.

The Company has a strong balance sheet with ~\$83mm in cash, which is enough to cover current liabilities ~40x over. Furthermore, Lithium Americas is not highly levered, with a debt to equity ratio under 1%.

### **Lundin Mining (TSX: LUN)**

Lundin Mining Corporation is a diversified base metals mining company primarily producing copper, nickel, and zinc. The Company's wholly-owned operating assets include the Eagle mine located in the U.S., the Neves-Corvo mine located in Portugal, and the Zinkgruvan mine located in Sweden. Lundin Mining also owns 80% of the Candelaria and Ojos del Salado mining complex located in Chile. The Company holds an indirect 24% equity interest in Freeport Cobalt Oy, which includes a cobalt refinery located in Kokkola, Finland. The Company's stock is up 31% since our last report due to strong Q2/2017 results and the sale of one of the Company's copper/cobalt producing assets.

Lundin Mining reported revenue of \$455mm for Q2/2017, a 33% increase from the same period last year. Increased revenue was driven by higher metal prices and higher production volume. Operating costs were \$210mm in Q2/2017, a 4% increase from the same period last year. Increased costs were due to higher production volumes, partially offset by lower per unit costs. Net earnings from continuing operations were \$64mm, compared to a loss of \$17mm in Q2/2016. Earnings were higher due to higher operating earnings, partially offset by a higher net tax expense.

Significant corporate actions for the quarter included the sale of their indirect investment in TF Holdings to an affiliate of BHR Partners for \$1.1B. The Company's 24% interest in Tenke Fungurume (a copper/cobalt mine) was held through their 30% interest in TF Holdings. Under the terms of the agreement the Company could receive an additional \$51.4mm, consisting of \$25.7mm if the average price of copper exceeds \$3.50 per pound and \$25.7mm if the average cobalt price exceeds \$20.00 per pound, both during a two-year period beginning on January 1, 2018.

Lundin Mining revised their 2017 guidance, due to the strong quarter and material changes to business operations.

Figure 2: Lundin Mining 2017 Outlook

2017		Production	and		Cost	Guidance
2017 Guidance (contained tonnes)			Previous Guidance <sup>a</sup>		Revised Guidance <sup>b</sup>	
			Tonnes	C1 Cost	Tonnes	C1 Cost
<b>Copper</b>	Candelaria (80%)		145,000 - 150,000	\$1.20/lb	147,000 - 151,000	\$1.20/lb
	Eagle		15,000 - 18,000		19,000 - 22,000	
	Neves-Corvo		41,000 - 46,000	\$1.00/lb	36,000 - 39,000	\$1.00/lb
	Zinkgruvan		1,000 - 2,000		1,000 - 2,000	
	Total attributable		202,000 - 216,000		203,000 - 214,000	
<b>Nickel</b>	Eagle		17,000 - 20,000	\$2.00/lb	20,000 - 23,000	\$1.35/lb
<b>Zinc</b>	Neves-Corvo		72,000 - 77,000		72,000 - 77,000	
	Zinkgruvan		80,000 - 85,000	\$0.40/lb	80,000 - 85,000	\$0.40/lb
	Total		152,000 - 162,000		152,000 - 162,000	

Source: Company Filings

The Company has a strong balance sheet that is flush with \$2B in cash, a 6.2x current ratio, and a 26% debt to equity ratio.

### FMC Corp (NYSE: FMC)

FMC is a diversified chemical company servicing agricultural, consumer, and industrial markets. The Company operates in three business segments: FMC Agricultural Solutions, FMC Health and Nutrition, and FMC Lithium. The Company's Agricultural Solutions segment develops, manufactures, and sells a portfolio of pest control and lawn and garden products. The Health and Nutrition segment focuses on nutritional ingredients, health excipients, and functional health ingredients. The Company's Lithium segment manufactures lithium for use in a range of lithium products. The Company's share price has increased 14% since our last report due to a strong Q2/2017 earnings release, highlighted by strong growth in the Company's lithium segment.

FMC reported revenues of \$657mm in Q2/2017, increasing 7% compared to the same period last year. Increased revenue was driven by strength in both FMC Agricultural Solutions and FMC Lithium divisions. Adjusted earnings from continuing operations was \$64mm in Q2/2017, a 4% increase compared to the same period last year.

FMC Lithium had a strong quarter with revenues of \$74mm, an increase of 17% compared to Q2/2016. Increased revenue was driven primarily by favourable pricing. Higher prices also helped the operating profit for the segment increase to \$45.8mm from \$14.4mm in Q2/2016. Management updated year-end guidance for FMC Lithium, forecasting revenue to be between \$340 - \$360mm, and increasing earnings guidance from \$100mm - \$120mm to \$115mm - \$125mm.

Figure 3: FMC 2017 Outlook

**Earnings Outlook**

- Full-year 2017 adjusted earnings of \$2.30 to \$2.50 per diluted share.
- Third quarter adjusted earnings of \$0.57 to \$0.67 per diluted share.

**Agricultural Solutions**

- Full-year 2017 segment revenue of approximately \$2.3 to \$2.4 billion.
- Full-year segment earnings of \$415 to \$445 million.
- Third quarter segment earnings of \$100 to \$120 million.

**Lithium**

- Full-year 2017 segment revenue of approximately \$340 to \$360 million.
- Full-year segment earnings of \$115 to \$125 million.
- Third quarter segment earnings of \$30 to \$35 million.

**Corporate and Other Financial Items:**

	<b>Full-Year 2017</b>
• Corporate and other	\$95 – \$100 million
• Interest expense	\$65 – \$75 million
• Adjusted Tax Rate	13 – 15 percent
• Non-controlling interest	~\$2 million
• Full-Year Weighted Average Diluted Shares outstanding	~135.5 million
• Depreciation & Amortization	\$90 – \$100 million
• Adjusted cash from operations	\$350 – \$450 million
• Capital additions and other investing activities	\$90 – \$100 million

Source: Company Filings

FMC has a strong balance sheet with \$113mm in cash, a ~2.3x current ratio, and a below industry average debt to equity ratio of 88%.

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