Chart of the Week #2023-08
Lithium - An Upstream View

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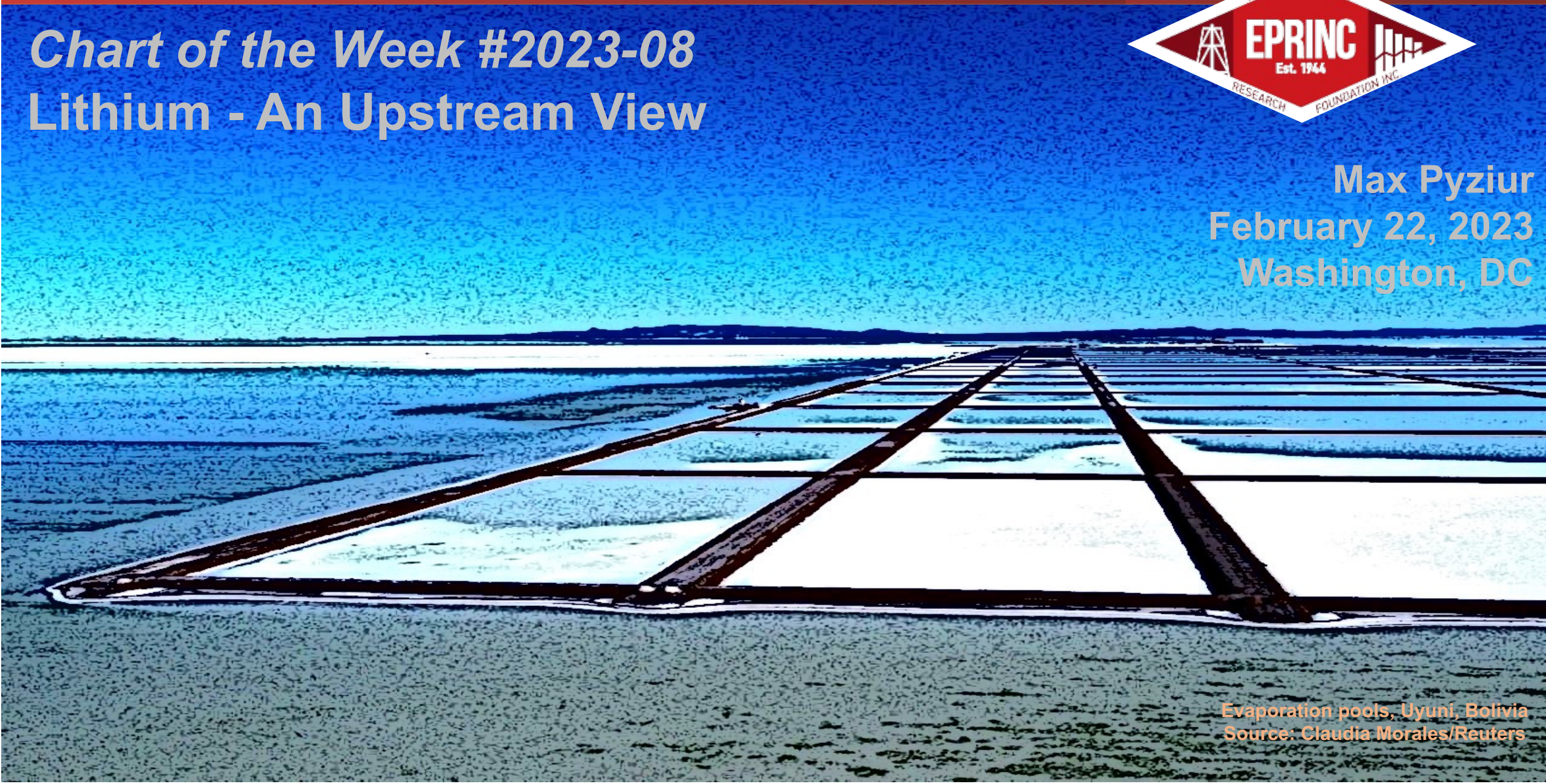
February 22, 2023
Washington, DC



Evaporation pools, Uyuni, Bolivia
Source: Claudia Morales/Reuters

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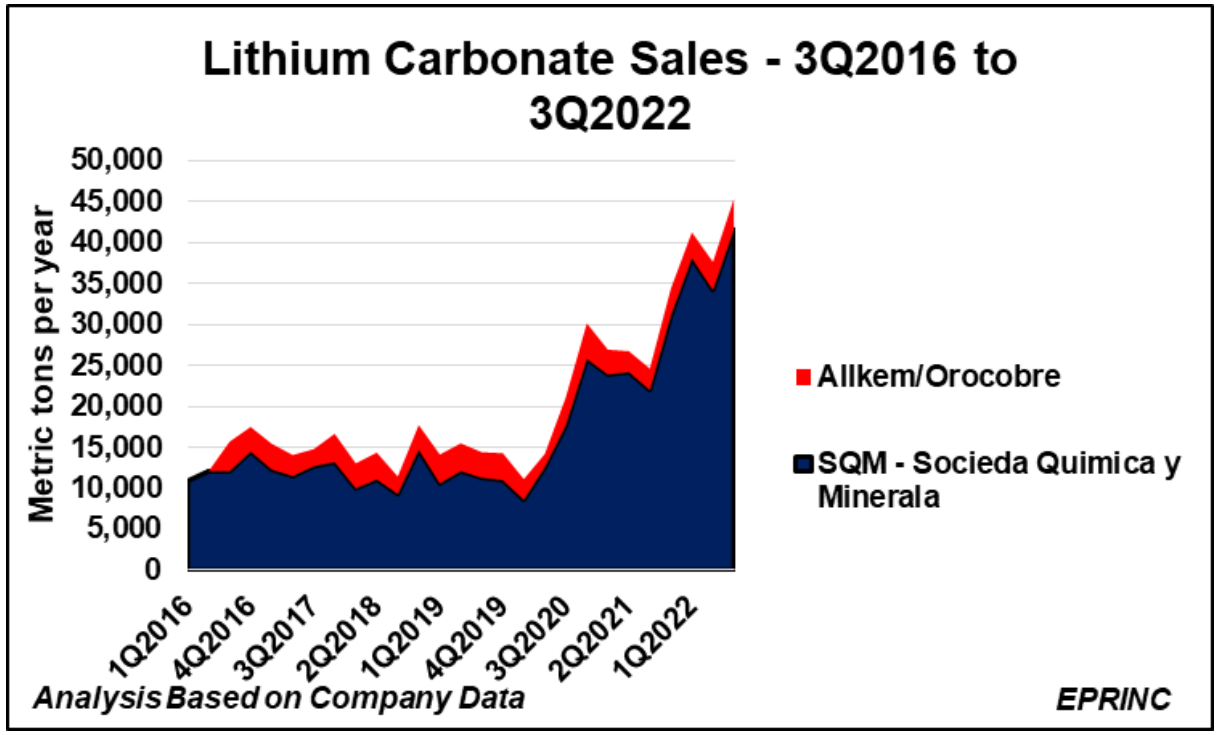
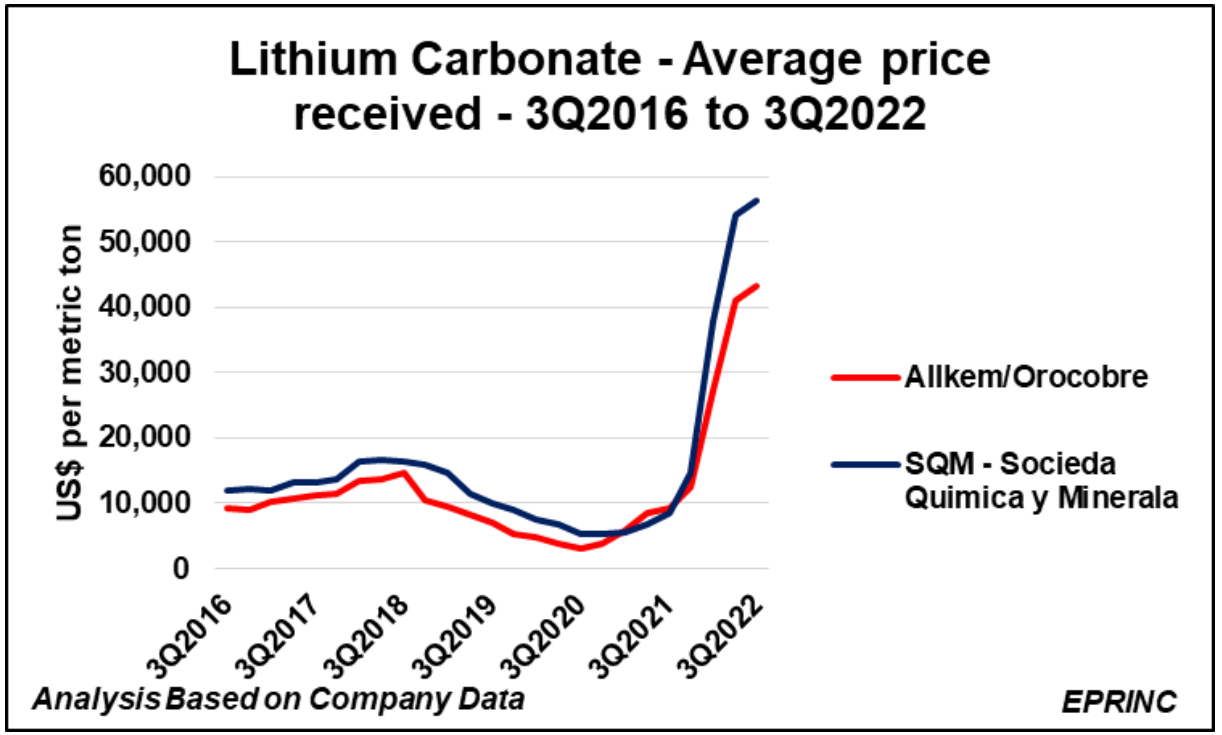
Allkem (formerly known as Orocobre) and Socieda Quimica y Minera (SQM) are two of several lithium producers located in the "lithium triangle," a prolific lithium-producing area straddling the borders of Chile, Argentina, and Bolivia.

SQM is a Chilean-based major estimated to produce about 16% of total global supply; Allkem, a junior headquartered in Brisbane Australia and producing about 4% of global supply, has its primary lithium operations in the Olaroz formation in northern Argentina.





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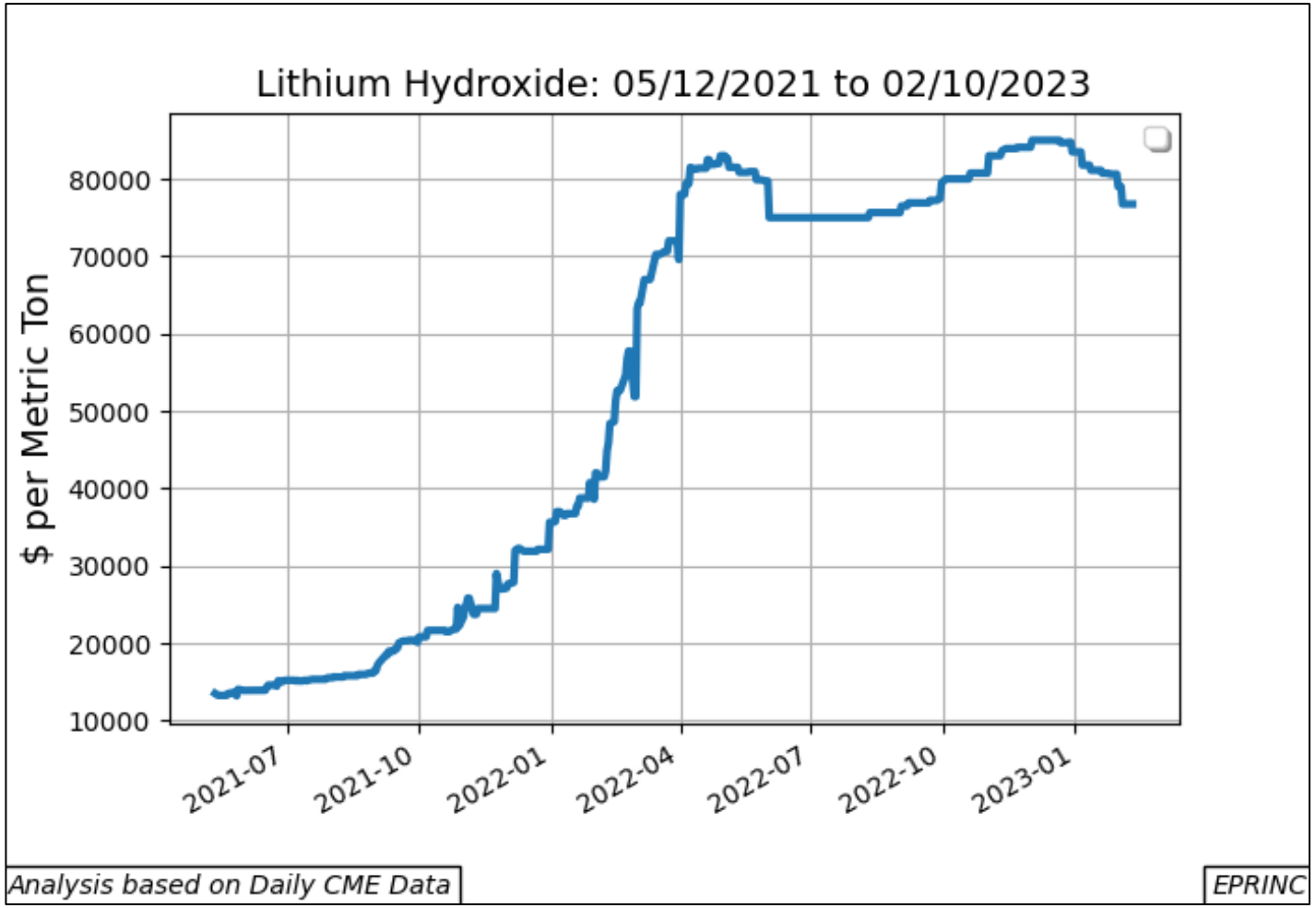

Beginning in mid-2021, the London Metal Exchange began trading lithium hydroxide futures in order to improve price transparency, standardization, as well as to bolster risk management throughout battery metal supply chains. The prompt month contract closely tracks published lithium carbonate spot prices.

Amount of Lithium per Metric Ton (mt) of Compound		
	Lithium Hydroxide	Lithium Carbonate
Purity	56.5%	99.2%
Lithium Amt	29.0%	18.8%
kgs/mt	163.8	186.4
lbs/mt	361.0	410.9
		EPRINC

Lithium - An Upstream View

- Lithium is the critical mineral required for most utility-scale power storage, electric vehicle batteries, along with the battery requirements for smartphones and laptop computers. Since it is unstable in its pure elemental form, lithium is marketed in one of two compounds: lithium hydroxide or lithium carbonate. Lithium is 29% of total mass with respect to the former; with the latter it is 18.8%.
- In the last few years, both lithium hydroxide and lithium carbonate prices have risen considerably as demand has outpaced supply.
- A Tesla Model S with a 70 kwh battery requires 63 kilograms / 138 pounds of lithium carbonate-equivalent (LCE), or 11.8 kilograms / 26 pounds of pure lithium. One metric ton of LCE fulfills the lithium requirements for almost 16 Tesla S batteries. In 3Q2018 and based on an average of Allkem and SQM's prices, LCE costs for one Tesla S averaged $972; in 3Q2022, $3,112.
- In 2021, LCE demand was estimated at 564 thousand metric tons. For 2030, the International Energy Agency (IEA) is forecasting almost 1.4 million metric tons of LCE primary demand in their Stated Policies Scenario; for IEA's Sustainable Development Scenario, the forecast is for over 2.5 million metric tons of LCE primary demand for 2030. To reach these levels, lithium production would have to grow at an annualized rate of 10.6% for the former or 18% for the latter.
- This slide deck is available on the EPRINC Website (https://www.eprinc.org/)
- For more information on this chart, please contact Max Pyziur (maxp@eprinc.org).