



Employ America Research Report

Contingent Supply: New Benchmarks Can Define and Deepen the Lithium Market

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Summary

Since the passage of the Inflation Reduction Act, efforts to secure the supply of energy transition commodities have intensified considerably. The Biden Administration has announced prizes, research and development initiatives, and loans for recovery projects to improve the U.S. supply chain for critical minerals. Other advanced economies are acting: Canada has announced an ambitious critical minerals strategy and the European Union briefly considered stockpiling critical minerals. These activities are at least partially a response to China's aggressive market strategy and continued dominance in the supply chain. Recently, the US and allied nations have floated the idea of a "buyers club" to secure supply of critical minerals.

Across nations, the agency or agencies tasked with executing the obligations of such a club have several design questions to answer, including what products to target, how to price the products, and how to match government authorities to the financial realities of commodity markets.

This piece continues the Lithium branch of our Contingent Supply series on the use of buffer stocks to provide for better energy security and energy market stability. Our first engagement with the lithium project outlined the benefits of a spodumene-centric lithium strategy. The second explored how to select the right location for a spodumene reserve economically and strategically. This piece outlines the importance of a deep, liquid benchmark contract for lithium as a means of expanding the capacity frontier and reducing exposure to price volatility.

Overview

To achieve our ambitious decarbonization targets, industrial producers like battery manufacturers or solar panel producers need reliable access to key climate transition commodities. This means vanadium for long-duration energy storage, polysilicon and aluminum for solar panels, lithium for EV batteries, and steel for basically everything. Unfortunately, this is challenging given the shallow, illiquid nature of many of these commodity markets. Therefore, we believe it is critical that the Federal Government play an active role in the development of these markets.

In these markets, firms can easily make contracts for arms-length and hedging transactions against a standardized market price for spot and future delivery. The markets for oil and copper are deep and liquid, while the markets for rarer minerals like vanadium or iridium – which are produced primarily as byproducts – are shallow, illiquid, and characterized by bespoke transactions.

The existing market for lithium is somewhere in the middle—it has been used for decades in various industrial processes (and even in 7UP!)—but never at a scale that warranted the development of a deep financial market. As the climate-critical EV and battery markets have matured, demand for lithium has exploded, but without transparency in pricing, centralization of transactions, or standardization of hedging instruments.

The hedging opportunities and price discovery by market benchmarks for lithium, tied to physical reserves, would go a long way towards solving certain collective action problems. By supporting the establishment of a liquid benchmark market for lithium, the Federal Government could help fulfill several important policy goals:

1. Boost production;
2. Support competition;
3. Build more resilient supply chains; and
4. Reduce price volatility.

Benchmarks Make Coordination Easier

Economic activity – especially new economic activity – does not always happen spontaneously, and when it does, it is rarely its most effective form. Instead, the complex modern industrial economy is characterized by communication between different firms, many of whom are tightly woven together in a mesh of crisscrossing supply chains.

These firms often communicate with one another over the prices of necessary precursors and intermediate products, but the form of communication matters. Private bespoke contracts are not transparent to the broader market, and can vary dramatically from firm to firm, depending on an extremely wide range of factors.

The introduction of a benchmark grade that can be credibly hedged against and delivered will drive the nascent lithium market into well-lit arenas, where policymakers and climate stakeholders can easily see how the upstream supply chain for battery storage, EVs, and dozens of other electrified products adapts to changing conditions. These benchmarks also give a natural “entry point” for the government to later intervene with a view towards shaping the market.

What would such a lithium market look like? Ideally, like the oil market did after the introduction of standardized benchmark contracts like Brent and West Texas Intermediate (WTI).

A Case Study In Deep Market Development: Oil

Oil wasn't always a deep market. Up until the 1970s, the market was dominated by the “Seven Sisters,” who exerted tremendous power in pricing. Following a wave of nationalization, the major exporting countries became the market makers. A further challenge emerged as a market characterized by vertical integration transformed into a market with state-owned companies responsible for a lot of production, but international companies still primarily responsible for refining. This posed a major threat as oil had become critically important to nearly all production of goods and services, so price shocks could propagate quickly and disruptively.

Partially in response to the price shocks of the 1970s, the US developed spot and futures benchmark contracts, including the WTI contract, which provided a mechanism for hedging oil exposure and price standardization. That mechanism was backed by actual physical stores of the commodity in Cushing, Oklahoma. This allowed both producers and consumers of oil to hedge against the barrels held on-site at Cushing when determining their capital structure for production. Furthermore, these benchmarks helped solve the coordination problems.

Although it took time for the spot and futures markets for WTI (and other benchmarks like Brent) to deepen, by the mid-1980s, nearly one-third of all oil-sales were made in the spot market, and by the late 1980s, nearly all internationally traded oil was linked to benchmark prices.

The effect of these benchmarks to reduce exposure to price volatility throughout the supply chain was best described by Daniel Yergin in his groundbreaking history of oil, *The Prize*:

“When a commodity is largely sold in spot markets, with prices that are very volatile and uncertain, buyers and sellers tend to try to find a mechanism to minimize their risk. That is what gave rise to futures markets, which allow a buyer to acquire the right to buy the commodity at some month in the future at a specific, known price. He is able to lock in his purchase price; he knows his risk. Similarly, a producer can sell his production forward, even before it is produced or, in the case of agricultural products, harvested. He, too, locks in his price. Both buyer and seller are hedgers. Their objective is to minimize their risk and reduce their exposure to volatility. “Liquidity” is provided by speculators, who hope to make a profit by getting themselves on the right side of swings in supply and demand—and market psychology...”

From here, we can understand the role that benchmarks play in securing the supply chain and expanding the capacity frontier for production—by reducing exposure to price risk. Price volatility has a harmful impact on the decision to invest, particularly on the smaller producers most responsible for marginal additional production. Therefore, by reducing exposure to price volatility, participants across the supply chain can invest with more ease, knowing they have at least some certainty about future demand and revenue.

An Ounce of Prevention for the Lithium Market

Lithium is unlikely to be as ubiquitous as oil, but there are key similarities. It is a key input to a range of desirable industrial production. Like oil in the 1970s, foreign countries (China in particular) play a dominant role in the market. And like oil in the 1970s, we can forecast extreme rising demand over the medium term.

Although forecasted demand should bring producers online, coordination problems and price volatility could dramatically limit the efficiency and pace of investment across the lithium supply chain. It would be prudent for the Federal Government to help develop a WTI-like contract before the kinds of disruptions that characterized the oil market of the 70s and 80s hit lithium. **As always in policy, an ounce of prevention is worth a decade of cures.**

China’s dominance in the lithium supply chain has left a fragile market structure,

leaving major producers reliant on Chinese production and vulnerable to the vicissitudes of Chinese domestic markets and politics. This fragile structure impacts contracting, price discovery, and financing for mining operations.

With respect to contracting- although there are market benchmarks, their usefulness to US market participants is limited. Accordingly, most contracts are entirely bespoke - thereby involving substantial amounts of idiosyncratic and counterparty risk. And for those contracts that are indexed to a benchmark- most are Chinese benchmarks. Therefore, idiosyncratic factors driving prices in mainland China can have a global impact, even if those factors are wholly irrelevant to the contract's participants.

This China-centric market design can have real impacts on the global price and availability of lithium, scrambling contracts for fragile climate tech firms and risky mining ventures alike. Take the example of the late 2010s: lithium demand, and prices along with it, crashed as China scaled back EV subsidies, leading to a wave of bankruptcies, restructurings, and consolidations. The impact on global lithium supply is still being felt: the supply undershoot that followed the crash is still affecting the price and availability of lithium for EVs and LDES storage.

All this makes the existing situation ineffective from a market risk hedging perspective: the index is too highly correlated to domestic Chinese market dynamics to be an effective hedge for many players. Similarly, securing physical delivery is currently difficult logistically and could become difficult geopolitically. To enable the fastest decarbonization and climate transition possible, we need an alternative benchmark to ensure that the relevant industries and market participants have access to a liquid and well-behaved market capable of physical delivery at processing-infrastructure-relevant locations.

Conclusion

Our goal here is simpler than the high-volume instantaneous balance of the global oil market. Instead, we are looking to balance the needs of vulnerable lithium mining and refining operations with the needs of still-risky climate tech and manufacturing. Transparent, well-governed, and production-relevant markets are key to speeding decarbonization.

Although oil is a much larger market, a liquid, well-governed financial market for lithium could play an integral role in decarbonizing our energy supply chain, supporting competition, boosting production, building a resilient supply chain, and reducing price volatility.

The Federal Government – in order to deliver on its decarbonization commitments – has an obligation to support the development of industries necessary to the success of the project. Establishing an arms-length spot-and-futures market for lithium attached to physical storage reserves is a critical next step in bringing our climate response from the launchpad to cruising altitude. Our next piece will further explore in further depth the government's role and policy goals.