

## Critical Materials Market Dynamics

May 20, 2024

US Department of Energy  
Office of Manufacturing and Energy Supply Chains  
1000 Independence Avenue SE  
Washington, DC 20585

### **RE: Response to Request for Information on Critical Materials Market Dynamics**

The Battery Materials & Technology Coalition (BMTC) appreciates the opportunity to provide information that will help the Department of Energy (DOE) formulate strategies to support and stabilize critical materials markets. It is crucial that the United States establish critical material supply chains that are resistant to geopolitical disruptions and reduce dependence on foreign nations that engage in hostile market practices, such as China. Reliable markets can be developed and stabilized with the federal government's support. We encourage DOE and the Biden Administration to focus on cross-agency strategies that create a holistic and impactful network of regulations, policies, and programs. By doing so, the economies of the United States and our allies will be more resilient, flexible, and better protected from the national security risks associated with reliance on non-allied nations that dominate critical material supply chains.

#### **Background on BMTC**

BMTC is a coalition of companies that mine, extract, process, manufacture, and recycle battery materials, and develop battery cathode, anode, cell, pack technologies in North America. The coalition is comprised of 17 member companies across Canada and the US, including facilities and operations in 27 states and current employment numbers of over 8,700 individuals, with projections for over 23,500 individuals to be employed by 2030. Our coalition is united behind a shared interest in growing a resilient and sustainable North American battery supply chain that ensures industry and government work together to seize the opportunity to secure the supply chains that power our way of life.

#### **Market Volatility in the Battery Supply Chain**

Many of the critical materials used in lithium-ion batteries are vulnerable to volatile price fluctuations. Graphite, lithium, nickel, manganese, cobalt, and silicon are all vital to the battery industry and have high-risk supply chains. Although these are included to varying degrees in critical mineral and material lists developed by the Biden Administration, including those managed by the Departments of Interior, Energy, and Defense, there is inconsistency across versions, use, and interpretation. We encourage the Administration to consider the markets for all these materials as part of DOE's review of critical material market dynamics.

There is one overarching reason the markets for these minerals have experienced volatility: China's manipulative market practices. China dominates the global supply chain for

critical minerals and abuses its production capability by creating more supply than demand. This oversupply allows China to maliciously influence global markets by flooding them with cheap, highly subsidized minerals, driving down prices in a concerted effort to smother foreign competitors.

Fueled by state-driven industrial policies, low or no wage protections, lack of environmental stewardship, and subsidized production, recent data shows China's overcapacity in the battery industry has quadrupled demand. The glut of Chinese battery materials has roiled markets and significantly impacted prices. China's ability to overproduce goods is made possible due to massive subsidies and other financial incentives provided to companies by the Chinese government. Cost of production for Chinese-owned entities is significantly lower due to Chinese banks - which are effectively controlled by the Chinese government - subsidizing projects with relatively "free" money. These projects are not limited to those operated on Chinese soil, as China's calculated strategy to control critical minerals markets often brings other countries into the fold. China deploys a "go-out" strategy, where it secures critical mineral mines in a country, and subsequently uses a "bring back" strategy to control the processing of those materials in China. There is an abundance of data that proves China's manipulation of critical minerals and materials markets, some examples of which are included below.

**Graphite** - Between 2021 and 2023, due to overproduction, China's supply of graphite-based anode material surpassed global demand. This has caused global graphite prices to decrease sharply. In 2023, a year after reaching its peak in 2022, the price of anode material produced from natural graphite fell 18% and is projected to fall a total of 27% by 2026. The price of anode material produced from synthetic graphite decreased even more – by 24% in 2023, with a projected total decrease of 38% by 2026.<sup>1</sup> Additionally, in October 2023, China enacted a protective trade measure to curb graphite exports. The Chinese Commerce Ministry announced it would require export permits for several graphite products, which was "conducive to ensuring the security and stability of the global supply chain and industrial chain, and conducive to better safeguarding national security and interests."<sup>2</sup> This step can only be interpreted as a tool to squeeze graphite supply with the goal of wielding geopolitical influence in a global market that is completely dependent upon China.

**Lithium** - Eighteen months ago, China publicly stated that lithium prices should be lowered, and in 2023, lithium prices plummeted by 81%<sup>3</sup>, forcing companies around the world to layoff workforce, shed assets, and reconsider future output. This was achieved in part by overmining lepidolite, which is a low-grade lithium ore that the mining industry generally does not extract due to cheaper alternatives. It costs \$25 per kilogram to mine and process lepidolite into lithium carbonate (the main component in iron-based battery

---

<sup>1</sup> Oxford Economics. [Enabling North American Graphite Growth](#). February 2024.

<sup>2</sup> Reuters. [China, world's top graphite producer, tightens exports of key battery material](#). October 2023.

<sup>3</sup> Reuters. [Piedmont Lithium lays off 27% of workforce amid weak prices](#). February 2024.

cathodes), while other abundant rocks such as spodumene can be converted to lithium carbonate for as cheap as \$5 per kilogram.<sup>4</sup> It is estimated that China ended 2023 with a massive surplus of iron-based cathodes – enough for 2.5 million EVs – further lowering lithium demand.

**Nickel** - Indonesian nickel producers, many owned or controlled by China as part of its “go-out” strategy, continue to dump into the market even as prices plunged 45% in the last year. In 2023, global nickel surplus reached 220,000 tons, almost entirely due to Indonesia’s oversupply. Indonesia now produces more than half of the world’s nickel and has become so confident in its ability to control the global market that its government recently stated prices will not rise beyond \$18,000 per ton on the London Metal Exchange (LME).<sup>5</sup> This intentional domination of the market has forced other producers to shutter operations, most notably in Australia.

**Manganese** - China produces over 90% of the world’s manganese-based products, including stainless steel additives and battery-grade materials. Three years ago, in a move to consolidate its global processing capability, dozens of Chinese manganese processors joined a state-backed “manganese innovation alliance” to exert control over supply and coordinate prices and stockpiling. The alliance has abused its overwhelming market share by manipulating supply and prices of manganese sulfate, a critical component of battery cathodes, as well as electrolytic manganese, which is a steel-strengthening additive.<sup>6</sup>

**Next-Gen Battery Materials** - In addition, next-generation battery materials are critical to the development of lithium-ion batteries, as they help reduce costs and increase reliance and performance. One such material is silicon, which is tightly linked to graphite and the anode market. The government should consider silicon and similar materials when appraising the battery industry and trade policy, such as tariffs. Many industry stakeholders believe the domestic industry’s long-term weapon in competing with China is innovation - more specifically, the ability to disrupt markets with new technologies. By supporting next-generation battery materials, the US can outcompete China through superior technology, with a particular focus on creating EV batteries that meet consumer demands for increased range, faster charging, and lower costs.

It cannot be overstated the negative effect the anti-competitive practices outlined above have on various market participants. It impacts the whole battery supply chain, including investors, equipment manufacturers, local governments, construction companies, and more. Domestic producers attempting to establish projects often must navigate cost-cutting measures even before revenue is established to remain financially viable. Even if they can begin operations, producers face demands from potential customers to be price

---

<sup>4</sup> The Electric. [Amid a Lithium Industry Bloodbath, Albemarle Lays off 300 Employees](#). January 2024.

<sup>5</sup> Bloomberg. [Indonesia Says Its Nickel Supply Will Keep Global Prices Low](#). February 2024.

<sup>6</sup> The Wall Street Journal. [China Hones Control Over Manganese, A Rising Star in Battery Metals](#). May 2021.

competitive with Chinese materials, which are artificially cheap as the result of massive subsidies.

### **The Offtake and Investment Problem**

While Congress and the Biden Administration have injected billions of dollars into stimulating the battery supply chain, further commitment from the government and private sector is needed to catalyze the exponential growth necessary to create and sustain a robust battery supply chain. However, battery industry companies are facing extreme difficulty in securing private investment from downstream customers and the financial sector.

The chief problem facing the battery supply chain is a “chicken-and-egg” circumstance in which companies are expected to secure long-term bankable (i.e., financeable) offtake agreements as well as significant private investments, both of which often require the other to move forward. China’s ability to flood global markets with cheap, highly subsidized critical minerals and materials makes it difficult for any project to secure fully financeable offtake agreements with OEMs, which include both auto and battery manufacturers. Therefore, without the ability to demonstrate greater certainty around future revenue, critical mineral and material companies are at a disadvantage when attempting to secure investments. This lack of investment deprives the projects of the adequate financing needed to bolster domestic production capacity to the scale needed to become cost competitive with China and create an independent battery supply chain.

The process to negotiate offtake agreements is often lengthy, largely due to the intense technology qualification process required by OEMs. Many domestic producers find it economically challenging to remain viable during that timeline due to the cash burn suffered throughout. A variety of other discouraging factors also compound during that timeline, including OEMs’ inclination to continue to work with existing supply chain partners. These factors cloud both the customer’s confidence that new supply chain entrants can succeed in scaling up and, equally critically, potential investor’s confidence that the business model is viable and can provide an appropriate risk-adjusted return on their investment. In addition, there is the conundrum of how to compete with China as markets continue to shift year by year. As one graphite producer recently posited, “How can an OEM commit to graphite that will only be available three years from now, when they won’t know if it can compete with the price of Chinese graphite in three years?”

Auto OEMs have been boxed into making these difficult offtake decisions because of China’s ability to overproduce EVs and sell them globally for much cheaper compared to domestic options. This forces domestic auto OEMs to explore every option available to reduce production costs to lower price tags for consumers. This inevitably leads to reducing expenditures on battery production, which is by far the most expensive component of an EV. In turn, this results in auto OEMs seeking the cheapest materials needed to manufacture the battery – all of which come from China. Therefore, auto OEMs

are also trapped in China's strategic net of manipulative market practices, further placing domestic critical mineral and material supply chains in peril.

In addition, battery supply chain companies must successfully weather the "dead period" between starting a project and becoming fully operational, which, depending on the sector, can take anywhere from 2-3 years (processing) to 6 years-plus (mining). This period includes permitting, construction, commissioning, upstream supply chains, product qualification, and product delivery. In addition to the timeline to construct a facility, certain long-lead manufacturing equipment can often take 2 years to receive and prepare for use, which significantly extends the amount of time before a company can commence operations, lengthening the window of opportunity for outside variables to impact the negotiations surrounding an offtake agreement.

### **The Role of the Department of Energy**

Considering the massive amount of capital that must be injected into the supply chain to make it competitive, policies should focus on catalyzing private sector funding and protecting the projects the government is already investing in. For this reason, we don't believe the government should necessarily pursue policies that result in the government purchasing and stockpiling a mineral, material, or technology, but instead should focus on creating price certainty between supplier and purchaser. Price volatility and cheap foreign critical minerals and materials are blocking US and allied markets from building projects, and implementing solutions to reduce risks associated with price issues should be a priority, particularly in the midstream (e.g. processing) sector. Tools must also be implemented to encourage price transparency, or even an alternative market price for critical minerals and materials. For instance, the federal government could use funds to backstop offtake agreements between the burgeoning North American supply chain and OEMs. Such a backstop could create a win-win, since offtake certainty will lead to greater investor confidence and help alleviate the "chicken-and-egg" investment problem.

DOE must also take steps to protect the long-term viability of projects it has invested in. Funding to facilitate early project development – while incredibly important - is focused mostly on capital expenditures (CapEx), so other tools must be deployed to help projects survive over their lifetime via their operational expenditures (OpEx). The reality is that one grant or loan that provides funding for the CapEx necessary to set up a facility will not make a project competitive. In addition, investors have signaled they are wary to invest in companies predominantly supported by the government. Success of a project will be determined long after the construction of the facility, when it is able to produce reliable volume at a competitive price over an extended period. Tools to help reduce operational expenditures, like tax credits and trade mechanisms, can help ensure the long-term health of a project. For example, the importance of the 45X Production Tax Credit towards helping with project OpEx cannot be overstated. The critical minerals portion of the credit is particularly important because it does not have a sunset, giving the industry long-term support and certainty. We encourage Congress and the Administration to implement more tools like 45X that can support the industry on OpEx and price competitiveness.

For new entrants to the battery supply chain and for established companies alike, access to global market information is critical. DOE must assume a much larger role in providing reliable, accurate information to stakeholders in the battery supply chain. The federal government, with its inherent authority and expertise, such as in the Energy Information Administration (EIA), should be the foremost source for the data and analytics that help shape consequential business decisions. DOE should consider collaborating with other entities to deliver real-time information about battery supply chain pricing, markets, and the factors influencing them. This could include not only federal entities such as EIA and Department of Commerce, but other bodies such as the London Metals Exchange (LME) and Chicago Mercantile Exchange (CME), which are well-positioned to help establish transparent critical mineral and material markets in the US. As an example, Commerce is already monitoring steel and aluminum industries to address the threat of China's overproduction. Stronger monitoring and a process to collect, analyze, and disseminate data on critical minerals and component production, demand, and market trends is needed and welcomed.

Finally, strong domestic content requirements will boost demand-side support within existing grant and loan authorities and other partnerships. If crafted correctly, strong content requirements can be successful in driving both domestic supply and demand. For example, the foreign entity of concern (FEOC) provision within the Inflation Reduction Act's (IRA) Section 30D Clean Vehicle Tax Credit is designed to block entities from China, Russia, Iran and North Korea from gaining access to the tax credit, but includes loopholes that allow certain materials to be sourced from these entities, amounting to a difficult-to-understand rule set. The content requirements and FEOC provision in 30D has caused confusion and is a windfall to foreign competitors, which undermines the industry's growth in the US and allied nations to the detriment of US national security and economic competitiveness. Future domestic content rules must also implement solutions that address China's ability to maneuver and manipulate projects to comply with the guidance. This includes laundering minerals and materials by propping up markets in FEOC-friendly countries and using techniques such as synthetic CO<sub>2</sub> tracking and piecemeal reporting to achieve compliance.

There are other mechanisms DOE can employ to help ensure price stability in critical mineral and material markets. For example, virtual offtake alternatives should also be explored, as they could provide a lifeline of immediate term revenue for companies to start up, scale up, and stay afloat until they're able to secure long-term offtake agreements. Contracts for difference would essentially establish a price floor that would prevent materials from being undercut by Chinese competition. In addition, direct procurement mechanisms, in which DOE acts as a commissary, could be a useful method to ensure project stability, particularly for the energy storage system (ESS) supply chain.

**Conclusion**

BMTC would like to thank DOE and the Biden Administration for their ongoing efforts to implement strategies that support and stabilize critical materials markets, and for fostering an important dialogue throughout the process. Like many other industries, the domestic battery industry is in a vulnerable position. Its future depends on the ability to establish robust markets that allow the United States and its allies to no longer rely on China and other non-allied countries for critical materials. BMTC stands ready to work alongside DOE to fortify the nation's critical materials markets to advance the domestic battery industry, bolster the US economy, and reduce dependence on foreign adversaries.

Should you have any questions about this response, feel free to reach out to Ben Steinberg at [bsteinberg@vennstrategies.com](mailto:bsteinberg@vennstrategies.com).