

**Company:** Big Blue Technologies, Inc

**Project Title:** Reshoring Magnesium Metal for Critical Energy Applications

### PUBLIC SUMMARY

Magnesium is one of the most critical minerals. Big Blue Technologies (BBT) is scaling up process technology to make magnesium metal in alignment with recent executive orders by President Trump:

- 14154 – Unleashing American Energy (January 20, 2025)
- 14156 – Declaring a National Energy Emergency (January 20, 2025)
- Immediate Measures to Increase Mineral Production (March 20, 2025)
- Ensuring National Security and Economic Resilience Through Section 232 Actions of Processed Critical Minerals and Derivative Products (April 15, 2025)

Magnesium metal has a strong industrial demand and is critical for the US Department of Energy (Fig. 1) and Department of Defense to produce lightweight vehicle components, aluminum alloys, and military incendiaries. There are no domestic primary producers; over 90% of global supply is controlled by China and Russia. Despite an abundance of magnesium ore, including in WY, and a 108% import tariff on Chinese metal, none of the existing commercial smelting technologies are economically viable in the US.

Big Blue Technologies has developed a new smelting technology to produce magnesium metal from ore. This technology used an aluminothermic method to produce pure magnesium metal and utilized the residue (slag) as a valuable calcium aluminate cement for a zero-waste process. The fully electrified and automated process ensure clean and safe operation. This technology is the only process to be competitive with China on a global scale.

Building on its existing pilot facility, BBT will create a vertically integrated mining and smelting operation to bolster a clean and economic production infrastructure. During this project BBT will build a full-scale Mg metal smelter at 100 ton/year. During the project period, **Wyoming will have the largest operating primary production facility in North America for magnesium metal.**

The team will increase the capacity of their ore-to-ingot process which includes pre-processing (shredders, mills, briquetters), smelting (modular 100 ton/year), and casting (melting furnaces, ingot casting line). Additionally, BBT will assess the viability of carbon capture and sequestration (CCS) from pure CO<sub>2</sub> generated during calcination of Wyoming dolomite.

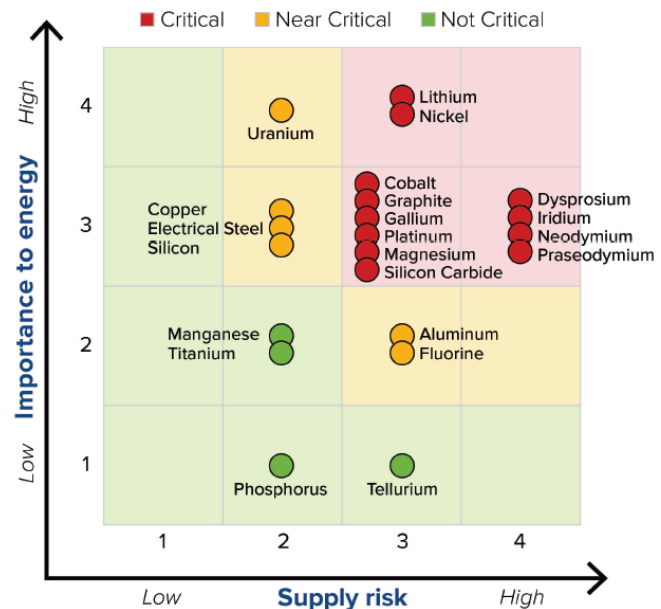


Figure 1: US Department of Energy's medium-term (2025-2035) criticality matrix.