

## **Technology Needs and Progress in Diversifying the Supply of Critical Materials for Clean Energy**

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Technologies enabling clean, carbon-free production and utilization of energy include wind power, energy-efficient lighting, electric vehicles, photovoltaic solar panels, batteries, and nuclear power. All of these technologies are undergoing active development to meet increasingly challenging goals of energy efficiency, environmental stewardship, and cost-effectiveness. Not surprisingly, advancements call for the use of very special materials that may be scarce or in uncertain supply. Thus, key technology needs start with assuring an adequate supply chain of required materials. Since 2013, the Critical Materials Institute (CMI) funded by the US Department of Energy has been developing technologies aimed at reducing the supply risk for five rare earths and several near-critical elements. This presentation will examine technology gaps within the changing landscape of the supply chains for such critical materials and the corresponding strategy within CMI for addressing those gaps. After over four years of effort, some significant strides have been made, and notable accomplishments will be presented. Results fall in three thrust areas: expanding supply by solving problems in metal recovery from primary sources, making separations and conversion processes more competitive, and driving the economics by finding new uses for co-products.

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