

interim, federal agencies will continue to work to alleviate supply chain vulnerabilities. In addition to research pursued by ARPA-E, the DLA's strategic stockpile charter includes a provision for R&D into domestic sources for all of its sought-after materials.

Scientific societies, including the Materials Research Society (MRS), have long advocated on behalf of concerted national policies that alleviate the precarious supply of essential materials. Damon Dozier, Director of Government Affairs for MRS, says, "The importance of the materials supply chain cannot be overstated, especially when it comes to REEs. MRS has worked with Congress and key policymakers in recent years to help our nation acquire and protect

these resources, and we will continue to do so in the future."

As outlined in a 2019 US Department of Commerce (DOC) report entitled *A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals*, the state of the supply chain of critical materials and REEs in the United States remains vulnerable. The country's cache of natural resources simply cannot provide a domestic source equal to the country's growing needs for consumer electronics, electric automobiles, high-tech weaponry, and life-saving instruments. Recent DOC, USGS, and DOE reports on critical minerals and rare earths all highlight the fact that the United States has a single REE mining and reprocessing facility—in Mountain Pass, Calif.—which had been mostly mothballed

since 2002 due to economic and environmental constraints. In order to minimize risks of future supply chain disruptions, the DOE 2020 "Critical Materials Rare Earths Supply Chain" white paper points to future R&D of materials alternatives, recycling approaches, and manufacturing methods in order to wean the United States off its dependence on non-US-sourced REEs and other scarce materials. In the meantime, however, a system of well-maintained, well-managed stockpiles of critical materials and products, coupled with nimble operations that rapidly adapt to evolving crises, remains the US Government's best—and only—line of defense against pandemic-induced shutdowns and similar breakdowns of its supply chains.

Boris Dyatkin

EC announces actions to increase security and sustainability of Europe's raw materials supply

Currently, the coronavirus crisis is leading many parts of the world to look critically at how they organize their supply chains, especially where public safety or strategic sectors are concerned. In September, the European Commission (EC) released its "Action Plan on Critical Raw Materials," the "2020 List of Critical Raw Materials," and a foresight study on critical raw materials for strategic technologies and sectors from the 2030 and 2050 perspectives. The Action Plan looks at the current and future challenges and proposes actions to reduce Europe's dependency on third countries, diversifying supply from both primary and secondary sources, and improving resource efficiency and circularity while promoting responsible sourcing worldwide.

The actions will foster the EU transition toward a green and digital economy, and at the same time, bolster Europe's resilience and open strategic autonomy in key technologies needed for such transition. The List of Critical Raw Materials has been updated to reflect the changed economic importance and supply challenges based on their industrial application. It contains 30 critical raw materials.

Lithium, which is essential for a shift to e-mobility, has been added to the list for the first time.

Maroš Šefčovič, Vice-President for Interinstitutional Relations and Foresight, says, "A secure and sustainable supply of raw materials is a prerequisite for a resilient economy. For e-car batteries and energy storage alone, Europe will, for instance, need up to 18 times more lithium by 2030 and up to 60 times more by 2050."

The Action Plan on Critical Raw Materials is aimed at:

- developing resilient value chains for EU industrial ecosystems;
- reducing dependency on primary critical raw materials through circular use of resources, sustainable products, and innovation;
- strengthening domestic sourcing of raw materials in the EU; and
- diversifying sourcing from third countries and removing distortions to international trade, fully respecting the EU's international obligations.

To achieve these objectives, the EC plans to establish a European Raw Materials Alliance. By bringing together all relevant stakeholders, the alliance will

primarily focus on the most pressing needs, namely to increase EU resilience in the rare-earth and magnet value chains, as this is vital to most EU industrial ecosystems, such as renewable energy, defense, and space. Later, the alliance could expand to address other critical raw material and base metal needs over time.

Thierry Breton, Commissioner for Internal Market, says, "By diversifying the supply from third countries and developing the EU's own capacity for extraction, processing, recycling, refining, and separation of rare earths, we can become more resilient and sustainable."

To make better use of domestic resources, the EC will work with member states and regions to identify mining and processing projects in the EU that can be operational by 2025. In line with the European Green Deal, other actions will address the circularity and sustainability of the raw materials value chain. The EC will also develop strategic international partnerships to secure the supply of critical raw materials not found in Europe. Pilot partnerships with Canada, interested countries in Africa, and across Europe will start as of 2021. In these and other fora of international cooperation, the EC will promote sustainable and responsible mining practices and transparency. □