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Innovation is the way out of China's chokehold on critical minerals

Editoriale

The United States cannot compete with China when it comes to the mining and processing of new critical minerals at scale. Yet American entrepreneurs are developing innovative hacks to help U.S. companies loosen China's stranglehold on the industry.

That's the key takeaway from [a new report](#) by the Council on Foreign Relations, which provides a hopeful review of some successes by companies tackling the problem.

The need for such innovation was made painfully clear last fall after Beijing sharply expanded its export controls on critical minerals, which are essential to a range of technologies. That forced President Donald Trump [to back off threatened tariffs](#) and underscored American vulnerability to Chinese blackmail.

American companies are racing to whittle away at that dependency. For instance, research originating at the University of Minnesota led to the development of high-performance magnets with iron nitride, circumventing the need for magnets made of rare-earth metals that China largely controls. That then led to the formation of Niron Magnetics, a commercial company now [constructing a manufacturing plant](#) in Minnesota.

Meanwhile, companies such as Lilac Solutions and Element3 are experimenting with technology that could nab lithium from fracking wastewater. That could be a game changer, since the byproduct of the natural gas boom has [high levels of the metal](#), which is in high demand to power electric vehicles and to store electricity.

Then there's Alta Resource Technologies, which is [building out a new source](#) of critical minerals for the U.S. The bioengineering company has designed specialized proteins that can snatch rare earth elements from the millions of tons of electronic waste

that Americans produce each year. That would be a huge improvement over current recycling techniques, which are time consuming and only economically viable abroad. Recycling strategies could fulfill [an estimated](#) 30 to 40 percent of all rare earth mineral demand in the U.S., Europe and China by 2050. That same innovation could also be applied to mining waste such as coal ash, which typically contains residual metals. Other companies are [developing similar chemical processes](#) to extract rare earths from mining waste, reducing pollution while also yielding economic benefits.

There's no guarantee these enterprises succeed. National labs and research grants are crucial, and many firms will fail anyway. But these startups are a reminder that, with the right incentives and sense of urgency, the West can innovate its way out of problems that seem insurmountable.