

US Needs 10X More Rare Earth Metals To Hit Electric Vehicle Goals And China Controls It All - So We Need To Move To Hydrogen Cars

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The United States needs ten times the amount of rare earth metals it currently has to meet President Biden's ambitious 2030 EV goals, according to one CEO in the business. And it needs 20 to 25 times more to meet the burgeoning needs of the green economy — and the military — as we increase investment in wind power, electric vehicles, and even cell phones to the year 2050.

President Biden has outlined a [goal](#) that 50% of cars sold in 2030 will be zero-emission electric vehicles.

But there's a problem.

To meet even part of that goal with domestic supply of rare earths seems almost impossible. And foreign sources are

increasingly problematic.

 Permanent magnet motor disassembled close-up

Detail of copper winding, stack and shaft of a electric permeant magnet motor for home appliances. ... [+]

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“You’ve got two light rare earths: neodymium and praseodymium and you’ve got two heavies, which is dysprosium and terbium,” USA Rare Earth CEO Pini Althaus [told me recently on the TechFirst podcast](#). “And they are used in EV drivetrains ... cell phones ... the F-35 striker jet has about a ton of rare earth magnets ... wind turbines have a significant amount.”

In other words, it’s not just the green economy at stake.

It’s a big chunk of the entire economy ... and national security.

There’s been essentially one magnet plant in the United States, Althaus says, located in North Carolina. It has production capacity of about 2,400 tons of permanent magnets each year, which was about 20% of the needed supply as of 2019. (Note: accelerating to a green economy would require an even greater supply.) USA Rare Earths [bought](#) that plant in April, 2020, and plans to have it “fully operational by the second half of 2022.”

USA Rare Earths is also developing a new mine in Hudspeth County, Texas, called the Round Top Heavy Rare Earth, Lithium, and Critical Minerals Project.

The mine isn’t yet in production, but the company has received \$50 million in series C funding to kick off mining. It’s currently

scheduled to come online in 2023 for not just rare earths but also lithium, gallium, hafnium, zirconium, and other key resources for electronics, magnets, and batteries.

 Oliver Llaneza Hesse

An open pit mine (not Round Top).

Getty Images

Theoretically, Round Top will produce no less than 15 of the 17 different rare earth elements.

But even if the Texas mine exceeds all predictions, it won't be enough.

"If you look at the materials that we have for permanent magnets or for lithium, it still accounts for sort of a percentage of the overall supply chain requirements in the United States," Althaus says. "We would need another four or five Round Tops to go up to start looking at having sort of what we would call independence or a lack of complete reliance on China."

At the moment, no rare earths for magnets are being produced and processed in the United States.

In an era of heightened tensions and economic competition, that's a national security and wellbeing issue even if it doesn't become a military issue.

What the lack of domestic production means right now is dependence on China, plus friendly countries like Canada and Australia. To Althaus, that's dangerous.

“There has been talk about a reliance on Canada and Australia, and this is a very foolhardy way to approach this for a couple of reasons,” he says. “One, Australian and Canadian project owners, they’re not required to sell into the U.S. supply chain. They don’t have CFIUS regulations. They could sell to anyone — they can sell the materials to China. In fact, some Australian companies have offtake agreements with China in place already, which means those materials will not come into the U.S.”

None of this is unknown to the U.S. government.

In 2020 the Senate Republican Policy Committee released a [policy paper](#) stating that while the U.S. was the world leader in rare earths production from the 1960s to the 1980s, it essentially flatlined to the point that in 2016, the U.S. imported all of the rare earths it needed.

There are a few domestic attempts to kickstart local production at an old rare earths mine in Mountain Pass, California. That’s worked, to a degree, but all raw material still needs to be shipped to China for processing before being returned to be inserted into production lines.

Or, more likely, built into products in China.

In August, lawmakers [introduced](#) a bipartisan bill to boost domestic rare earths production.

And as of September of 2021, the U.S. Department of Commerce has [announced](#) an investigation to determine the effects on U.S. national security. A report is due to President Biden by June 18, 2022, though ideally it will be much sooner.

“The Department of Commerce is committed to securing our supply chains to protect our national security, economic security, and technological leadership,” U.S. Secretary of Commerce Gina M. Raimondo said in a statement. “Consistent with President Biden’s directive to strengthen our supply chains and encourage investments to shore up our domestic production, the Department initiated a Section 232 investigation on imports of NdFeB permanent magnets to determine whether U.S. reliance on imports for this critical product is a threat to our national security.”

Wild guess here: the answer is yes.

Unfortunately, U.S. companies looking to assist don’t have the government help and coordination that some other countries enjoy. They will essentially do consortium buys for all local industrial needs, aggregating demand and getting better access to supply like a giant national Costco bulk purchase.

“U.S. government doesn’t have an apparatus similar to that of China or even Japan, where they’re buying materials or entering into agreements on behalf of whether it’s the automotive sector, consumer electronics companies,” says Althaus. “They’re not going to be buying materials for a GM or Ford or anyone else ... Japan has taken a very important and robust approach to this, which is working ... to fund companies like Lynas, secure the offtake for their materials, and then they’re bringing those materials, whether it’s for defense, whether it’s for consumer electronics, other sectors ... they’re working on behalf of the overall economy that will require these materials.”

The U.S. doesn’t necessarily need to cover 100% of its own needs for rare earth metals, Althaus says, even if that might be nice.

Even 50-60% would help ensure that the global supply is not weaponized by China — which did [cut off supply](#) to Japan for 40 days in 2010 in an international spat over territorial waters.

Today, even China is a net importer of rare earths: part of the reason for the countries expansive Belt and Road initiative.

Solving this, however, won't be easy.

“Rare earth deposits, they don't just get turned on by the flick of a switch,” Althaus told me. “They evolve, sometimes a decade or two of drilling, having the right economics, being able to develop those projects.”

“So a lot needs to get done for us to have any sort of independence from China if we're going to get to the goals that we're trying to achieve.”