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1. U.S COAL ASH LANDFILLS HOLD ENOUGH RARE EARTHS TO BOOST RESERVES EIGHTFOLD

U.S COAL ASH LANDFILLS HOLD ENOUGH RARE EARTHS TO BOOST RESERVES EIGHTFOLD

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Body

London: International Centre for Sustainable Carbon has issued the following press release:

The U.S remains heavily reliant on China ' s rare earths.

Researchers from The University of Texas at Austin have released estimates that U.S coal ash contains 11 million tons of rare earth elements. 70% of the coal ash produced from 1985 to 2021—totaling about 1.9 billion tons—is potentially recoverable.

Rare earths

Since the days of President Jimmy Carter and the 1970s oil crisis, the United States has relentlessly pursued the utopia of energy independence. One of Trump ' s many "Unleashing American Energy" directives requires the Secretary of the Interior to instruct the director of the USGS to "consider updating the survey ' s list of critical minerals, including for the potential of including uranium. " Unfortunately, the U.S remains heavily reliant on China ' s rare earths, with the Middle Kingdom supplying nearly three-quarters of its needs. China refines 89% of the world ' s neodymium and praseodymium, the key metals for EV magnets. To complicate matters, U.S REE imports from other countries including Estonia (6%), Japan (3%) and France (3%) are themselves heavily dependent on chemical substances and mineral concentrates produced in China. This leaves the United States particularly vulnerable to trade wars with a major rival, something Beijing is not shy to leverage: In 2023, China banned the export of technology to extract and separate rare earths in a bid to protect its rare earths industries.

Thankfully, the country is now closer to finding a solution to its REE conundrum. Researchers from The University of Texas at Austin have released estimates that U.S coal ash contains 11 million tons of rare earth elements, nearly eight times the country ' s known domestic reserves. Long considered an industrial waste, coal ash is the powdery byproduct left after burning coal for fuel. This is the first national assessment of coal ash as a resource.

“This really exemplifies the ‘trash to treasure ’ mantra,” said Bridget Scanlon, co-lead author of the study and a research professor at UT Austin ’ s ***Bureau of Economic Geology***. “We ’ re basically trying to close the cycle and use waste and recover resources in the waste, while at the same time reducing environmental impacts. ”

Unlike traditional mining, coal ash extraction comes with a key advantage since the burning process has already separated the minerals from their original ore, thus reducing the need for energy-intensive refining steps.

“There ’ s huge volumes of this stuff all over the country,” said Davin Bagdonas, a research scientist at the University of Wyoming. “And the upfront process of extracting the (mineral host) is already taken care of for us. ”

According to the research, not all coal ash is the same. Different regions of the country contain varying concentrations of rare earth elements, which determines how easily they can be extracted. For instance, coal ash from the Appalachian Basin has the highest concentration of REE, averaging 431 milligrams per kilogram while coal from the Powder River Basin has a lower concentration (264 mg/kg). However, only ~30% of coal ash from the Appalachian Basin can be extracted while coal ash from the Powder River Basin has a much higher extractability rate of 70%, making it a more viable option for large-scale recovery.

Quest For Critical Minerals

Rare-earth elements (REE) is a group of 17 relatively rare elements used in small amounts in the manufacture of consumer electronics including smartphones and PCs, electric vehicles, green technologies such as wind turbines, medical equipment and tools and even in military hardware. The glass industry is one of the largest consumers of REE: For instance, lanthanum makes up as much as 50% of cell phone cameras and other digital camera lenses. An average hybrid EV also uses about 10-15Kg of lanthanum in its batteries. Meanwhile, neodymium or samarium greatly increases the potency of magnets, allowing those components to shrink in size.

The importance of critical minerals to the United States is not lost on Trump. Last month, Ukrainian President Volodymyr Zelenskyy declined a proposal by Trump to acquire approximately 50% of Ukraine ’ s rare earth mineral rights. Valued at several trillion dollars, Ukraine ’ s mineral reserves include lithium, titanium and graphite that are essential for high-tech industries. The proposal was delivered by U.S Treasury Secretary Scott Bessent as part of a bid to compensate Washington for assistance to Kyiv. Trump had suggested that Ukraine owed the United States $500 billion worth of resources for its past military support.

However, Zelenskyy sought better terms, including U.S and European security guarantees. Trump ’ s proposal did not include provisions for future assistance, which Zelenskyy deems necessary. Zelenskyy ’ s team has developed an offer for a mineral partnership in exchange for security guarantees, which was announced earlier this month.

Meanwhile, Australia ’ s rare earths developer, Lynas Rare Earths, recently declared it has the rare earths the West needs and the skills to economically produce them.

“Our view, to get guaranteed supply in the West, is to buy products from Lynas because we have it. We have the resource, and we have the skills to process that resource cost efficiently,” Lynas CEO Amanda Lacaze said last month.

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