

Researchers suggest the climate crisis requires international minerals agreement

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Saleem Ali pictured in the Bayan Obo mining region within the Inner Mongolia region of China in 2017 in front of a massive ore nugget of rare earth minerals which is being celebrated here with the following words: "Welcome to the Rare Earths Community." Credit: University of Delaware

As the United States and other countries around the world begin to transition to utilizing green technologies on a larger scale, it will be necessary to have access to the minerals needed to build the infrastructure for those green technologies.

Growing international tensions and geopolitical events, however, especially among the United States, China and Russia, have led [countries](#) to re-examine their mining and processing capabilities. For a country like China, which is dominant when it comes to mining and processing minerals, this may not have much of a negative impact as their mineral supplies continue to grow. For a country like the U.S., however, and any other country which is currently short on metal supply, decoupling from the largest mineral supplier in the world could spell disaster for the transition to [green energy](#).

An interdisciplinary group of researchers from academia and industry has written an article in the journal *Environmental Science and Technology* addressing this problem and proposing a possible solution, including an integrated mineral supply agreement between nations.

The lead author for the paper was Saleem Ali, the Blue and Gold Distinguished Professor of Energy and the Environment at the University of Delaware and chair of the Department of Geography and Spatial Sciences, who also holds a secondary appointment in the Joseph R. Biden, Jr. School of Public Policy and Administration. Julie Klinger, assistant professor in the Department of Geography and Spatial Sciences, was a co-author on the paper. In 2017, she published a book on the global geography of rare earth prospecting and mining called "Rare Earth Frontiers."

Sophia Kalantzakos, Global Distinguished Professor in Environmental Studies and Public Policy at New York University, is the paper's corresponding author.

Green energy infrastructure

Ali said that for the U.S. to meet emission reduction targets outlined in the Paris Climate Agreement, there must be a massive amount of renewable energy infrastructure built.

Solar power, wind energy, and electric car batteries, just to name a few, have several metals necessary for their creation. However, according to Ali, there is not a good plan in place about how the U.S. is going to resource the metals necessary to scale-up those [green technologies](#).

"The environmentalist community is well intentioned, but they are a bit misguided when they think that we can just recycle metals and reuse them," said Ali, who is also the co-director of the Delaware Energy Institute. "Ultimately, we want to recycle, but we don't have enough metal stocks to recycle. Even for electric car batteries, for example, recent data from the European Union shows that we will not have enough recycling stock for batteries going on even into 2030 and 2050. These metals will have to be mined in order to eventually have enough recycled battery stock."

Mineral supply security

Mining and processing those metals, such as lithium, cobalt and nickel, will be difficult for the U.S. to achieve on its own.

China, however, is a dominant force in the world when it comes to processing and mining these metals. While the current political climate is calling for the U.S. and European economies to distance themselves from China in order to reinvigorate domestic manufacturing capacity or build regional capabilities to cut emissions from transoceanic trade, this could spell disaster for the green energy transition.

Rather than simply shun those countries, Ali said that as climate change is a planetary threat, and there are institutions in place like the International Renewable Energy Agency that was established precisely for the world to plan for a green transition, the countries in the G20 should negotiate an agreement on mineral supply security.

"Regardless of our differences with China and Russia, we should focus on making sure there is some agreement on mineral supply security to meet the obligations of the green energy transition," said Ali.

Historically, these metals have been used for the military-industrial complex and thus posed a national security issue. This paper, however, makes clear that the metals should only be used for green technologies and that the challenge of decarbonization should be addressed in a global manner so that all countries, regardless of political differences, should cooperate.

Ali pointed to the World Trade Organization as an example of how countries, despite their differences, can negotiate together and cooperate for the good of the world.

"The article lays out some of the recommendations for establishing such a global mineral supply agreement where countries would say, 'Look, regardless of our differences, if the metals are going to be used for green technologies, we will assure supply,'" said Ali.

In part, Ali said this is only reasonable as minerals are geologically determined. It just so happens that China and Russia are huge countries that have a lot of naturally endowed minerals and are thus able to capitalize on their geologic fortune.

He also said that another consequence of every country hunkering down and excluding others from access to the minerals would lead to

ecological consequences, as countries would be forced to start extractive industries in places where it might not be environmentally friendly to do so.

"You don't want to set up a mine in a vulnerable ecosystem in the U.S. just because we want to be mineral secure," said Ali. "You want to do it where it's ecologically efficient. That's the other important part of this agreement: if we hunker down into resource nationalism completely, we will potentially end up harming the environment in the long run because we will end up creating mines where it's not ecologically efficient."

This does not mean, however, that the U.S. should ignore its allies. The paper makes clear that "near-shoring," or working with countries like Australia and Canada that are friendly to the U.S., should absolutely continue in order to diversify the U.S.'s mineral supply.

"We are not saying that shouldn't be done, but a global [mineral](#) supply agreement would diversify and create more resilience for the green energy transition. That's what we have argued for," said Ali.

In addition, Ali said that if the U.S. is serious about achieving its green energy transition, it needs to be more realistic about its goals.

Setting unrealistic targets for decarbonization in a short period of time, such as by the year 2030, is another problem as the necessary green energy generation, transmission and storage infrastructure is not in place to achieve such a lofty goal.

"As much as we appreciate the thought of it, it cannot be done while at the same time saying, "We are decoupling from China," and that is a serious problem," said Ali. "We need to try to arrange better ties with securing these supplies through a global agreement with China and other countries where it is more practical to extract."

More information: Saleem H. Ali et al, Closing the Infrastructure Gap for Decarbonization: The Case for an Integrated Mineral Supply Agreement, *Environmental Science & Technology* (2022). [DOI: 10.1021/acs.est.2c05413](https://doi.org/10.1021/acs.est.2c05413)

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