Scarcity of new energy minerals will trigger trade wars

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It's not hard to argue in favor of alternatives to fossil fuels these days, but one popular argument – domestic energy security – may be standing on very shaky legs. A lot of rare metals are needed to make photovoltaic panels, rare earth magnets for wind generators, fuel cells and high-capacity batteries for hybrid and electric vehicles. But most industrialized nations, including the United States, are almost entirely dependent on foreign sources for those metals. The only way this is going to change is if there is more domestic exploration and mining.

"There's a misunderstanding in the public about moving to alternative energy and moving from mining, which can't be done," said James Burnell of the Colorado Geological Survey. Burnell will be speaking about the resource demands of alternative energy technologies on 2 Nov. at the annual meeting of the Geological Society of America in Denver.

There is a long list of scarce metals needed for alternative energy and transportation. Metals like gallium, indium, selenium, tellurium, and high purity silicon are needed to make photovoltaic panels. To make batteries there's zinc, vanadium, lithium and rare earth elements as well as platinum group minerals for fuel cell-powered vehicles. One of the biggest players in the scarce metals game is China, and they are starting to play hard ball, says Burnell.

China is preparing to build 330 giga-watts worth of wind generators. That will require about 59,000 tons of neodymium to make high-strength magnets -- more than that country's annual output of neodymium. China

supplies the world with a lot of those rare earth elements, like neodymium, and will have little or none to export if it moves ahead with its wind power plans.

"So the source for the West is problematical," said Burnell. Trade wars are on the horizon, he predicted. Yet policy makers and the public seem only superficially aware of the problem.

"It is obvious that Japan was upset by the practical pause of rare earth export by China in late September," said Yasushi Watanabe of the Institute for Geo-Resources and Environment in Tsukuba, Japan. On Nov. 1 at the same Geological Society of America meeting Watanabe will be presenting his work on the geology of these critical elements and where they can be found.

New sources of these critical metals are needed, said Watanabe, as well as new methods for extracting the rare elements from different kinds of rocks.

"Extraction methods of metals from new minerals and materials are not well established," said Watanabe. "We need to develop new (refining) and smelting methods for new type ores."

We also need to find those ores and start exploiting them, said Burnell. That means more mining. It's the only way we can stay competitive in the new energy future.

More information: gsa.confex.com/gsa/2010AM/fina … /abstract_178652.htm
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