

Future Resource Competition in the Technology Space: China's Critical Materials

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Sustainable development hinges on the advancement and proliferation of technologies enabled by an increasing number of materials that have no substitutes and are subject to supply disruption. The markets for many of these critical materials are driven by China's production, consumption, overseas acquisition, and government policy. But, which of these materials are critical to China's technologic, and therefore economic, development? This analysis assigns a Chinese criticality score to more than sixty materials covered by the US Geological Survey's annual Minerals Yearbook. This score is the product of a China-specific measure of supply risk, the percentage of global production outside of China, and the percentage of material consumed in emerging technologies. For the twenty four materials that receive a score greater than zero, Chinese net import reliance is calculated from estimates of Chinese production and consumption – stock levels are assumed to remain constant. To provide additional context, the twenty four materials are compared to national stockpiling lists in the Pacific-Rim, existing criticality lists, and a Chinese list of materials crucial to core emerging industries. Of the materials identified as potentially critical to China; all were on at least one Pacific-Rim stockpile list, all but four were on existing criticality lists, and thirteen had Chinese net import reliance estimates greater than sixty percent. The results indicate that, although China dominates global production of many critical materials, it is vulnerable to supply disruptions of its own. China has initiated a strategy of overseas acquisition to secure access to many of these twenty four materials – seventeen of which the United States is more than sixty percent net import reliant. Future research ought to address the impact that price increase, and international competition for access, might have on sustainable development goals that rely on technologies enabled by China's critical materials.