Tracing metal footprints via global renewable power value chains

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The globally booming renewable power industry has stimulated an unprecedented interest in metals as key infrastructure components. Many economies with different endowments and levels of technology participate in various production stages and cultivate value in global renewable power industry production networks, known as global renewable power value chains (RPVCs), complicating the identification of metal supply for the subsequent low-carbon power generation and demand. Here, we use a value chain decomposition model to trace the metal footprints (MFs) and value-added of major global economiesâ€™ renewable power sectors. We found that the MFs of the global renewable power demand increased by 97% during 2005â€”2015. Developed economies occupy the high-end segments of RPVCs while allocating metal-intensive (but low value-added) production activities to developing economies. The fast-growing demand for renewable power in developed economies or developing economies with upper middle income, particularly China, is a major contributor to the embodied metal transfer increment within RPVCs, which is partly offset by the declining metal intensities in developing economies. Therefore, it is urgent to establish a metal-efficient and green supply chain for upstream suppliers as well as downstream renewable power installers for just transition in the power sector across the globe.