

Old energy security issues, new energy security issues: the upcoming geopolitics of the circular economy

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Overview

For several years now, several authors have pointed out the redefinition of geopolitics pending the energy transition, with particular attention given to the potential for largely increased shares of renewable electricity in energy production and consumption. Some posited links are straightforward: for instance, the geopolitical importance of reserves of fossil fuels may give way to an enhanced role for rare earth elements reserves, with distributional consequences across countries and regions. Other links are more indirect, such as the power dynamics involved in the construction and management of regional supergrids, intended to make demand response more effective.

In this paper, I argue that the growing popularity of circular economy principles alongside this energy transition adds a layer of complexity to these developments. In one potential complication, drastically increased demand for renewable energy technology will both deplete specific resources and increase their value, augmenting pressure to adopt circular economy principles. On the face of it, this is a welcomed development, as a broader transition toward these principles is needed to ensure sustainability in the century to come.

However, in implementing circular economy principles in this context, concerns related to security of supply may result in a multiplication of protectionist measures, potentially locking out some countries from access to materials and, ultimately, end services. In other words, the “circles” of circular economies in various sectors may be closed, not just in the resource management sense (by ensuring that re-use and recycling of materials is maximized within the economy); rather, political, economic and social rationales may lead to policies that put such a high value on reusing materials found in manufactured products that they in fact become equivalent to restricting access to the materials themselves, however plentiful they may be overall. These rationales, even if they do not go as far as creating shortages of essential materials for some populations, create uncertainty with regard to geopolitical developments, which can lead to either zero-sum games or cooperation, depending on the paths chosen by governments around the world.

Methods

This paper looks at this and other potential developments, using two sets of data: projections made by scenario modelling complemented by statistics on known reserves of some materials; and current and past idiosyncratic evidence that provides early hints of some of these developments – that is, “mini” case studies showing early efforts by countries with regard to key raw and recycled materials.

Results

The first set of data, in particular rare earth element reserves, their geographical distribution, and the different technologies required for an expansion of their production around the world, show indeed the potential for geopolitics to play an increasing role in the rolling out of circular economy principles in high technology sectors, including ICTs and renewable energy generation technologies, as well as electricity demand response management systems.

The mini case studies complement these structural global political economy elements by providing evidence of countries using policy design to ensure a long-term advantage: for instance, China's establishment of strategic reserves for rare earths, increasing worries elsewhere in the world given the country's dominance of global production, the discussions over various supergrid projects in Europe (e.g., the Baltic Energy Markets Interconnection Plan, DESERTEC, etc.), and various examples of new policies limiting the export of recycled materials.

Conclusions

The “politics” in geopolitics provides both for worry and promise, as none of the difficulties outlined make it impossible to design cooperation mechanisms. This paper's conclusion provides a list of aspects to use as a reflection for developing and fostering cooperation intended to thwart or at least temper the worst aspects of these developments for the near and longer-term future, and ensure that the broader ecological transition is inclusive and benefits all regions and populations.

References