The geopolitics of China’s rare earths: a glimpse of things to come in a resource-scarce world?

Rare earth minerals have become a strategic resource. Although they are unfamiliar to many, rare earths are essential in a range of common electronic applications and clean and green technologies. A mix of global and national interests intersect, and often conflict, around rare earths in ways that are likely to be seen with other resources as global power relationships shift and the world enters a new period of resource scarcity.

While the rare earth elements are relatively abundant in the earth’s crust, they can be considered a scarce resource for several reasons. First, global demand for them is rising fast, while legal production peaked in 2010 and has fallen dramatically since then. Furthermore, economically viable reserves of rare earth minerals (REMs) are concentrated in very few countries, so the decisions of individual exporters (and particularly China) can have a major impact on global flows. Finally, the extraction and processing of rare earths come with high costs — in energy and related greenhouse gas emissions; and in local environmental damage and related risks to human health — which inevitably limit the scope for increased production.

One interesting aspect of REMs is their role in climate change mitigation. While their extraction and production can add significantly to the greenhouse gas emissions and energy bills of the producer state, they are essential in clean and green technologies that are central to global climate mitigation efforts. Deploying these technologies also helps consumer states to meet their national mitigation targets and improve energy security.

Another fact that adds relevance to the case of rare earths from a geopolitical perspective is that by far the biggest producer and exporter is China. Industrialized countries have become heavily reliant on exports of commodities and goods from developing countries, where low wages, less stringent regulation, small domestic markets, and a greater willingness to bear the externalities of production in return for income have kept prices low. As emerging economic powerhouses like China develop and become less willing to bear these externalities, it is radically disrupting such relationships.

Finally, recent disputes over China’s REM-related policies have called into question whether the existing international governance mechanisms, particularly the World Trade Organization (WTO), are up to the job of mediating in such cases.

Reserves and production
The rare earths are 15 elements in the lanthanides group of the periodic table, along with scandium and yttrium. While deposits of rare earth minerals occur in many places, including China, Canada, the United States, India, Vietnam and Sweden, extraction is only economically viable (because of the quality of the minerals as well as factors such as wage levels and regulations on extraction) in very few. Also, while reserves are relatively abundant, known reserves with mineable concentrations are less common than for other minerals (US Geological Survey 2014).

According to the US Geological Survey, rare earths reserves amount to 140 million tonnes, of which China has 55 million tonnes, Brazil has 22 million tonnes and the United States has 13 million tonnes (US Geological Survey 2014).

China’s share of the world’s remaining REM reserves is uncertain; estimates range from 39% to 23% (US Geological Survey 2014; Information Office of the Chinese State Council 2012). However, there is more agreement among different data sets on shares of global REM production. Figure 1 shows the estimated legal, or known, annual global production of rare earths from 1990 to 2012, and the contributions of the major producers to those totals. Most notable is the massive growth of China’s role, from producing just over 27% of REMs in 1990 to a peak of 98% in 2008-2009. By 2012, China’s share had dropped to about 86%, while other producers, mainly the USA, Australia and India, accounted for around 13%. Some argue that China achieved dominance by undercutting other countries’ export prices, which was pos-
China's rare earths-related policies

That rare earths are a strategic resource for China is nothing new. 'While the Middle East has oil, China dominates rare earths', China's former leader Deng Xiaoping is reported to have said in 1992, at a time when China accounted for just over a third of global rare earth production. With the ‘open and reform’ policies set in place in the late 1970s, a combination of rich natural endowment of rare earth resource, cheap labour, and relatively low production costs enabled China to quickly dominate the world REM market. Between 1978 and 1989, China increased its rare earths production by 40% annually (Hurst 2010). China’s entry to the WTO in 2001 created even more favourable conditions for export, leading to record high rare earths export years between 2004 and 2010.

The increase in REM production in China had severe health and environmental consequences. REM production, including separation and purification, generates huge amounts of toxic waste, which must be safely managed to avoid environmental damage and risks to human health. In Baotou, Inner Mongolia, the heart of Chinese rare earth production, polluted wastewater has long been discharged effectively untreated (Hurst 2010). This has contaminated drinking water sources, farmland, and the surrounding ecosystems, elevating cancer rates, reducing agricultural productivity and causing public concern (Wuebbeke 2013). Partly for this reason, China launched a series of policies to regulate, and restrict the growth and impacts of, its rare earth industry, such as the Rare Earth Industry Development Plan (2009-2015) and Several Opinions of the State Council on Promoting the Sustained and Healthy Development of Rare Earth Industry (Wuebbeke 2013).

Another reason for the deliberate attempts to ‘cool’ the REM industry was China’s realization of its acute energy security challenges from the beginning of the 2000s. Energy efficiency and energy conservation became high national policy priorities, leading to a remarkable decoupling of economic growth from growth in energy consumption (Hallding et al. 2009). In the 11th Five-Year Plan (2006-2010), China for the first time set compulsory goals to cut the energy intensity of its economy – by 20% within five years. A range of policies was followed to discourage the rapid growth of energy- and resource-intensive sectors, including REM production (Information Office of the Chinese State Council 2012; Hallding et al. 2009).
By 2009, environmental and resource policy drivers had started to show impacts on the development of the REM industry in China, cutting production, tightening control on mining rights, and setting caps on total mining and production volumes (Information Office of the Chinese State Council 2012).

**International disputes and conflicting narratives**

Another aspect of these new policies was swingeing cuts in China’s REM export quotas, which triggered a set of trade disputes in the WTO and very public speculation about China’s real motives.

Commentators both inside and outside China have interpreted China’s actions in geopolitical terms. On the one hand, international observers have accused China of acting as a ‘rogue economic superpower’, using its REM export quota for competitive advantage internationally (Krugman 2010; Hayes-Labruto et al. 2013). Inside China, a geopolitical framing of rare earth issues in terms of a ‘war’ in which China is defending itself against foreign attack is widespread among citizens and media (Wuebbeke 2013). Chinese academics suggest that China’s actions on rare earths are guided by a combination of domestic demand, environmental concerns, social upheaval, the need to curb illegal smuggling and mining activities, and the desire to abide by international trade regulations, rather than resource nationalism (Hao and Liu 2011). The Chinese government has argued that rare earth prices have been below their intrinsic values for a long time; they have not properly reflected the scarcity of rare earth reserves, and the damage done to society and environment has not been sufficiently compensated (Information Office of the Chinese State Council 2012).

In September 2010 the Chinese government temporarily blocked all rare earth shipments to Japan, following an incident in which a Chinese ship’s captain was detained by Japanese authorities. This chain of events further fuelled international suspicions that China was abusing its rare earth exports as a political weapon – something the government has denied (Hao and Liu 2011).

In March 2012, the USA, Japan and the EU formally requested dispute settlement consultations with China on its export restrictions on various rare earths, tungsten and molybdenum (World Trade Organization 2012). The complainants argued that China’s rare earth policies, including export duties, export quotas and related administrative requirements, constituted a distortion of free trade and discrimination against foreign businesses. China defended its export controls on the grounds of environmental concerns and broad national goals for sustainable development. Nevertheless, in March 2014 the WTO ruled that China was acting in breach of WTO rules. China is expected to appeal (Wang and Martina 2014).

While the WTO ruling was still pending in 2013, China continued to issue domestic rare earths policies, including new crackdowns on the illegal exploration, distribution of rare earth products, as well as new restrictions and caps on production. For example, in July 2012 the Ministry of Industry and Information Technology imposed technology, capacity and safety criteria for approval of new rare earths separation projects (Wuebbeke 2013), which replaced an earlier ban on approvals of new projects until 2015 imposed in 2010. At the same time, China’s rare earths industry is to be consolidated into three regional state-owned enterprises in order to control disorderly mineral exploitation, limit excessive mining, and strengthen environmental protection. Between 2011 and 2012, the rare earth industry and related enterprises were encouraged to spend over 4 billion RMB (US$653 million) on strengthening environmental protection through pollution control and technological upgrades (Information Office of the Chinese State Council 2012). Thus, there seems to be little prospect of China backtracking in response to the WTO ruling, or putting significantly more rare earths on the market the kinds of prices seen in the 1990s and early 2000s. The gap between global supply and demand will remain, and grow, unless other countries are prepared to greatly boost production.

Another unfortunate side-effect of China’s restrictions on rare earths has been the burgeoning of illegal mining and smuggling in the country. The amount of rare earths imported from China, according to foreign customs authorities, has been substantially higher than China’s legal exports in recent years (Information Office of the Chinese State Council 2012). Given the unregulated nature of illegal mining, it is likely to be even more harmful to health and local environments than the legal version, under-mining China’s mitigation attempts. With rising demand but lower export quotas, illegal mining and smuggling are likely to keep rising unless more efficient controls are put in place.

**Reflections**

From a geopolitical point of view, the case of REMs is typical of critical resource sharing. The limited supply of REMs puts net exporters in a strong negotiating position compared to net importers. As this imbalance has grown, states have become increasingly important actors in REM trade issues. China, as the pre-eminent exporter, is seeking to maximize economic gain for its industry and minimize costs (in this case, particularly, the harmful environmental and social impacts of production). Importers, meanwhile, are mainly interested in a secure, stable supply (de Ridder 2013). While both sides stand to benefit from trade cooperation, these conflicting interests can interact with and add to interstate tensions – particularly when states introduce interventionist policies – giving trade disagreements a geopolitical character.
The case of REMs is also typical in terms of changing national interests as the emerging economies ‘catch up’, not only economically but also environmentally. Developed economies have tended to rely on developing economies for commodities and products with significant environmental externalities. Once the developing countries are no longer so willing to bear these externalities, and have greater domestic demand for the commodities and products, the interests of importers are inevitably affected.

With the energy-intensity of their production, REMs illustrate the potential conflicts between national economic interests and global common goods – in this case climate. From the perspective of emissions, it is in the global interest for China to move as fast as possible to curb emissions from REM production. However, with REMs such a strategic resource for any country seeking to manufacture renewable energy and other high-end technologies, importers seem unwilling to accept any slowdown in production (or at least exports), whatever the reason. The REMs case is given a particularly interesting twist by the fact that they are so critical for the development of technologies that reduce energy-related greenhouse gas emissions.

Finally, the recent controversies over China’s REM production and trade have exposed the inadequacy of existing international governance mechanisms, particularly the WTO, to deal with the sustainability dimension of trade disputes. Currently, most such disputes are treated as purely trade issues, with rulings based on short-term economic priorities rather than long-term sustainability (Esty and Ivanova 2002). This framing does not satisfactorily capture the complex issues related to sharing scarce resources – economic and environmental, national and global, short and long term – which makes it difficult for policy-makers in resource-rich countries to manage both national interests and international commitments simultaneously. To fix this, innovation in international governance will be required, making it better able to balance multiple interests at multiple scales. While stronger acceptance of every country’s right to set its own sustainability standards for minerals extraction does little to ensure a steady market supply of rare earths, it is a necessity for critical resource sharing in a world of increasing scarcity.

References


This discussion brief was written by Yiying Zhang, Guoyi Han and Marie Jürisoo. It is based on Zhang’s 2013 Uppsala University master’s thesis (Zhang 2013).