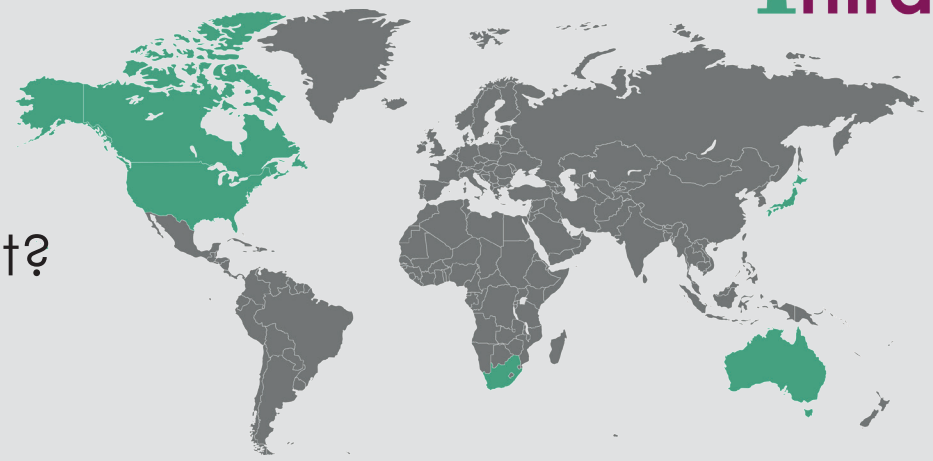
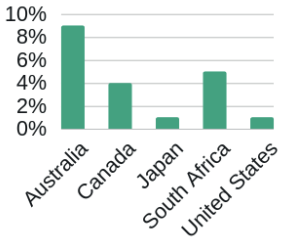
RESEARCH & INNOVATION

International best practice: who is doing what?



Globally speaking, we see that **countries that have a strong manufacturing industry try to limit the impact of potential supply shortages**. **Japan** is an excellent example of this approach. The country has defined policies on how to avoid shortages (e.g. through funding international mineral exploration) and they have defined R&D policies that are supposed to reduce dependencies on materials (especially Rare Earths) in the long-run (e.g. through recycling, substitution of critical materials).

Australia's situation is somewhat similar to **Canada**'s, as both countries seek to maintain investment in the mining industry, while promoting sustainable development practices in mining. Both are vast countries, in which the federal states (or provinces/territories) play a strong role. They often operate mines in remote locations and have developed a capable mining equipment, technology and service sector. Both countries need to prepare for a number of challenges (lowering production costs, lack of skilled workers, decreasing ore grade, to name a few), which force them to re-think the current mining policies and, among others, to reinforce research and innovation.



Relevance of mining related to the overall GDP in the regions.

The **U.S.** is a country with significant minerals endowments and a strong processing industry, however, the relative share of the mining industry is smaller than in Canada, Australia and South Africa. With the exception of the DOE's policies to secure the provision of critical and strategic materials, the U.S. pursues a less explicit raw materials strategy. The major agencies involved in minerals and materials (DOI, DOE, DOD) sponsor R&D projects, but there are no comprehensive research & innovation programmes especially designed for the mining sectors. Much of the R&I in minerals is driven by industry.

South Africa represents a resource abundant country, but has a very different historical background and this has impacted R&I. Its main objective is to reduce unemployment, inequality and poverty through developing the minerals value chain, especially by having more minerals processed before they are exported. During its long history of mining, the country has developed a competitive level of know-how and a remarkable industry of suppliers of mining equipment and services. Innovation-wise, though, the country has seemingly come to a standstill. There is little industry engagement with research and a significant decline of personnel and (publicly funded) mining research programmes.

REGION	INNOVATION INPUT SUB-INDEX (VALUE & RANK/144 (5))	
Australia	64.8	10 (3)
Canada	65.1	09 (2)
Japan	63.8	12 (4)
South Africa	45.2	54 (5)
United States	67.3	05 (1)

Innovation input sub-index of the regions. Source: Dutta, et al., 2015

Additional information as well as the evaluation of the maturity of Research & Innovation activities can be found in the ***transactional report on Research & Innovation***.