



Canada's Rare Earth Deposits Can Offer A Substantial Competitive Advantage

Policy Brief

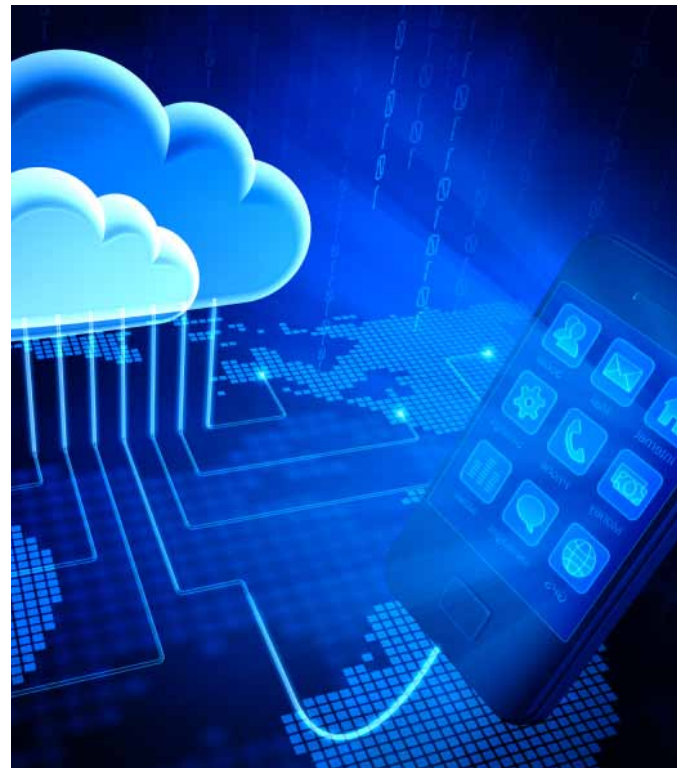
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Introduction

On March 13, 2012, the United States, the European Union and Japan filed a complaint at the World Trade Organization (WTO) against China over its restrictions on exports of rare earth elements, also referred to as rare earth metals.

China controls 97.3 per cent of the world's production of rare earths,¹ leaving importing countries vulnerable to supply disruptions.

Few of us have heard of these metals. With names like lanthanum, promethium and praseodymium, they sound more like city-states in Ancient Greece. Although often needed in small quantities, these metals are essential to the production of many technologically sophisticated products that are important to the daily lives of consumers. They are also in high demand by the defence and renewable energy industries.



¹ U.S. Department of the Interior. "Mineral Commodity Summaries, 2008-2011." U.S. Geological Survey. 2011. India accounts for the other 2.0 per cent of mine production, Brazil 0.4 per cent and Malaysia 0.3 per cent.

The Canadian Chamber is committed to fostering a strong, competitive and profitable economic environment that benefits all Canadians. This paper is one of a series of independent research reports covering key public policy issues facing Canada today.

We hope this analysis will raise public understanding and help decision-makers make informed choices. The papers are not designed to recommend specific policy solutions, but to stimulate public discussion and debate about the nation's challenges.

The rare earth opportunity for Canada

Canada has 1.1 billion pounds of rare earths locked in black shale deposits (the Alberta Black Shale Project) worth an estimated \$206 billion that were previously not recoverable unless large amounts of cyanide and arsenic were used to liquefy the ores – a process that is considered dangerous and illegal in many parts of the world. Now, a new, more cost-effective and environmentally friendly technology that uses water, air and microbes (a technique known as bioheap leaching) can be used to release the rare earth from the black shale deposits.²⁵ The new technology has a limited track record – only one mine (operated by Finland’s Talvivaara Mining Company Plc.) is producing metals through bioheap leaching. Toronto-based DNI Metals, a junior mining company, has said it needs \$1 billion to get the project going.²⁶

Several other Canadian mines show great potential.

- Avalon Rare Metals Inc.’s Nechalacho Rare Earth Element Project, located at Thor Lake in the Mackenzie Mining District of the Northwest Territories, has exceptional wealth of heavy rare earth elements. It contains some of the largest deposits of light and heavy rare earth elements outside of China. Avalon estimates a possible start date of 2015 for full capacity production.
- Great Western Minerals Group Ltd.’s Hoidas Lake Project, located in northern Saskatchewan, has one of the highest
- proportions of neodymium present in any known rare earth deposit. This makes it strategically important to the permanent magnet industry. The company is working on designing an optimal concentration/leaching process with the goal of starting production in 2015–16. Great Western Minerals is also exploring the heavy rare earth-enriched Red Wine Property northeast of Churchill Falls, Labrador; the Benjamin River Property near Bathurst, New Brunswick; and the Douglas River area of Saskatchewan.
- In July 2011, Midland Exploration Inc. started exploration with state-backed Japan Oil, Gas and Metals National Corp. (JOGMEC) on its Quebec rare earth project, Ytterby. The Japanese Ministry of Economy, Trade, and Industry is investing in projects worldwide to receive access to stable supplies of rare earth elements.
- Pele Mountain Resources is focused on the sustainable development of its Eco Ridge Mine Uranium and Rare Earth Elements Project, located in Elliot Lake, Ontario. The government of Ontario has recently granted two renewable 21-year mining leases for Eco Ridge, giving Pele the exclusive right to mine in the leased areas.
- Matamec Explorations Inc. is currently exploring its Zeus property, located in the Temiscamingue region of Quebec. Toyota Tsusho Corp. has signed a non-binding

²⁵ Absolute Wealth Contributor. “Rare Earth Mineral Stocks.” February 23, 2012. Also, Commodities Reporter. “Massive Mine in Canada.” September 20, 2011.

²⁶ Gordon, Julie. “DNI Metals enlists ore-munching bacteria to extract base metals—PDAC.” *REE-Investor*. March 5, 2012.

memorandum of understanding with Matamec to fast-track the development of the Kipawa deposit to secure a supply of heavy rare earths, which are used in the production of Toyota's hybrid and electric vehicles.

- Quest Rare Earth Mineral Ltd. is currently advancing several rare earth projects in the Strange Lake and Misery Lake areas of northeastern Quebec. The mineral deposits are exposed at surface and are amenable to a low-cost open pit mine with the potential to provide a long-term, stable supply of separated and refined heavy rare earths.
- Cache Exploration Inc. is exploring the Welsford rare earth properties in New Brunswick and the Cross Hills and Louil Hills rare earth properties in Newfoundland.

- Kirrin Resources Inc. operates rare earth exploration projects in Newfoundland and Labrador and in Quebec.
- Rare earth potential has been confirmed on Forum Uranium Corp.'s North Thelon Project in Nunavut.

Other Canadian-based rare earth explorers and miners are developing mines in Canada and around the world. Nova Scotia-based Ucore Rare Metals Inc. is exploring a project on Bokan Mountain on Prince of Wales Island in Alaska. Toronto-based Stans Energy Corp. is progressing heavy rare earth properties in areas of the former Soviet Union, and Great Western Minerals Group is focused on putting the Steenkampskraal mine in South Africa into production.

Conclusion

"Everyone has started to search for rare earth elements...The Japanese are desperately searching all over. Europe has a new strategic plan to secure rare earth elements too. It all started with concerns over China's monopoly, triggering a race to find new deposits and mine them,"²⁷ said Michel Jebrak, a mineral resources specialist at the University of Quebec in Montreal.

Canada has been blessed with great geology. Many Canadian mining companies are actively exploring for and delineating rich, rare earth deposits in a number of geographic regions across the country.

"Rather than being the unassuming neighbour of the United States the hunger of the world's economy for resources may mean that Canada will increasingly have political leverage and influence."²⁸

²⁷ Pouliot, Gaétan. "Canadá entra en la carrera por tierras raras, claves para la alta tecnología." *Agence France-Presse (AFP)*. December 19, 2011.

²⁸ Blachford, Kevin. "The Canadian Pivot to China?" *The Montréal Review*. March 2012.

For further information, please contact:

Tina Kremmidas, Chief Economist | tkremmidas@chamber.ca | 416.868.6415 ext 222