



August 4, 2017

Hon. Wayne Easter, P.C., M.P.
Chair
House of Commons Standing Committee on Finance
FINA@parl.gc.ca

RE: The Opportunity in Cleantech Materials

Dear Mr. Easter,

Please consider the following as a request from the Ontario Cleantech Materials Group (“OCMG”) to appear before the House of Commons Standing Committee on Finance as part of the 2018 pre-budget consultation process.

The three main points the OCMG wants to share with the Committee are:

- Canada can leverage its natural resource wealth to participate in rapidly growing global cleantech supply chains.
- This can be achieved by producing the critical materials and by manufacturing the advanced, value-added products and components required via sustainable methods.
- The Government can support this sector by supporting pilot and demonstration projects, as well as process development work, to capitalize on the jobs and economic opportunities presented by the shift to a low carbon economy.

About The Ontario Cleantech Materials Group

The Ontario Cleantech Materials Group was sparked by the Ontario Ministry of Northern Development and Mines who hosted a Battery Supply Chain Roundtable in October 2016. This was followed by a Panel at the Mining Innovation Summit in Sudbury on “*Hot Commodities: New Materials and New Opportunities for a Low Carbon Economy*”.

The OCMG’s goal is to stimulate production of value-added cleantech materials and to leverage the Canadian strategic advantage in natural resource endowment and metallurgy into anchoring the domestic manufacturing of downstream cleantech components and end-products. This is being pursued by increasing awareness, engagement, partnerships and collaboration to establish advanced material production and innovation.

The OCMG membership spans the lithium-ion battery supply chain - advanced materials extraction, production and manufacturing, research and development, commercial laboratories, battery manufacturing and battery recycling companies. This full supply chain is supported by members from leading universities, associations and service providers. The OCMG is an open and collaborative network and effort, focused on advocating for the industry, and not individual companies or projects. Within the group, you have the players needed to create cleantech material supply chains right here in Canada.



Figure 1: Current OCMG Membership

The Opportunities for Canada in “Cleantech Materials”

Cleantech materials are and will continue to be critical inputs to the products that reduce and prevent adverse environmental outcomes and ultimately enable a low carbon economy.

As noted by Natural Resources Canada in their March 2017 Information Bulletin, “The country’s dynamic mineral exploration sector; supportive public policies; expertise in mining, processing, and mine financing; and a robust project pipeline provide a strong foundation on which to attract investment and expand output to supply all or most of the critical inputs needed by manufacturers of clean energy materials and products.”¹

Numerous materials, such as refined forms of graphite, lithium, rare earth elements, cobalt, scandium, vanadium and others, are absolutely fundamental to mass uptake of clean technologies including electric vehicles, wind & solar power, fuel cells, energy storage, light weighting materials and other clean technology applications.

Furthermore, for both environmental and economic reasons, manufacturing and recycling these products in the most efficient and environmentally friendly manner possible is a necessity and demanded by customers and consumers.

Growth in this sector can support numerous government policy objectives including:

- Job creation and economic development in advanced manufacturing - by commercializing innovative, efficient, and sustainable processes and putting advanced material projects in to production
- Create critical products for burgeoning global cleantech value chains and leverage additional advanced manufacturing activity (automotive, energy storage, aerospace, artificial intelligence, autonomous vehicles etc.)

¹ <http://www.nrcan.gc.ca/mining-materials/publications/19447>

- Current and future cleantech material projects offer immense economic opportunity for remote and Indigenous Communities
- By fostering collaboration, develop a highly skilled workforce that is a leader in technological development, innovation and leading-edge technology, as well as a strong competitor in global cleantech value chains

Emerging Lithium-ion Battery Sector Opportunities

The critical importance of the lithium-ion battery to a low carbon world is one immediate global value chain opportunity where Canada can immensely increase their international market share.

Lithium-ion battery technology has evolved, and continues to evolve, to become the preferred energy storage solution for electric vehicles, home and grid energy storage, and other emerging applications as the world transitions to a low carbon economy. Within this transition lies abundant opportunity for Canada to create battery supply chains that begin with the sources of the critical materials which can anchor and leverage downstream investment and activity and end with the recycling of these same batteries at their end of life.

The OCMG believes it is in the Canada's interest to actively pursue and support the cleantech materials sector in participating in this emerging industry. However, we are competing against other jurisdictions with similar plans to leverage their resources thus time is of the essence.

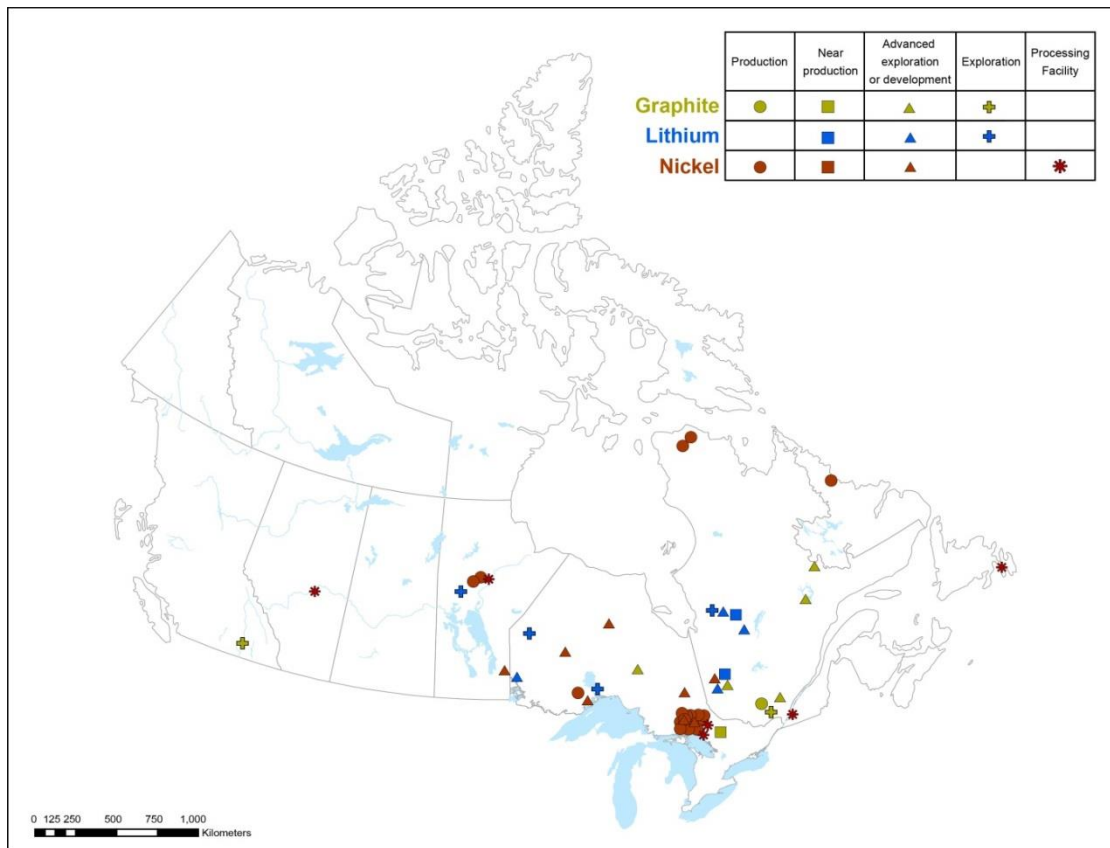
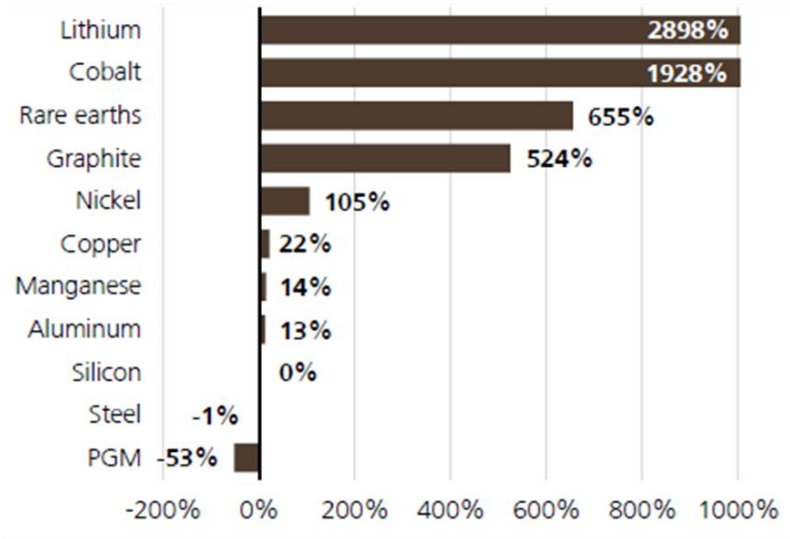


Figure 2: Mines, Processing Facilities, and Exploration Projects Associated With Inputs for Advanced Batteries



Source: UBS estimates

Figure 3: Incremental commodity demand in a 100% EV world (% of today's global production)

Challenges Facing the Cleantech Material Industry

There are fundamental differences between traditional base metals mining and producing advanced materials needed for cleantech supply chains in that the challenge and risk to entering the market is in process technology as opposed to in finding a world class deposit, as is the case in the base and precious metal sectors.

Cleantech material producers share challenges proving process technologies and reaching commercialization - i.e. overcoming the “commercialization gap” - as the process technologies are innovative and unproven at production level scale. Furthermore, the applications for cleantech materials are relatively new and so demand new unique and innovative processes and specifications.

Cleantech materials companies must produce specialty engineered and refined chemical products tailored to the specific, and generally stringent, requirements of the end user. The business is more akin to an advanced manufacturing business than a typical mining business, in that the risks are associated with designing an efficient extraction process to achieve the desired product quality rather than risks associated with resource quality. These businesses are in essence an advanced manufacturing chemical business that also operates a mine site or buys from others the needed material feed.

Part of this challenge is end users want samples, sometimes large volumes, of the final product for evaluation before they can commit to supply contracts. This requires building a sizeable pilot/demonstration plant, a costly and risky route for which capital is difficult to obtain from traditional equity market sources and where one private partner is generally unwilling to take on the entire cost and the accompanying risks on their own. There is a role for government to address this challenge, which is not without precedent. In Quebec, *Ressources Québec* has been active in this supportive role with a recent example being support for *Nemaska Lithium's* demonstration plant in Shawinigan, QC, which has put the company in a strong position (offtake

agreements already in place for a large percentage of planned production) to capitalize on the fast-expanding global demand for lithium.

Many OCMG members are advanced material/chemical companies, not “mining” companies - the majority of the risks, innovation, jobs, investment are in the downstream steps.

Investing in Canada’s Cleantech Materials Sector

Canada is facing competition and needs to act if we are to take advantage of this landmark opportunity to become a major competitor in these developing global cleantech value chains.

The committee has asked, “What measures would help businesses to undertake research, innovation and commercialization, purchase advanced technology and equipment, invest in the training and development of their employees, participate in global value chains and increase their international market share?” With these questions in mind the OCMG would suggest:

1. Support commercialization projects in the cleantech materials sector via policy instruments and programs (i.e. Strategic Innovation Fund, NRCan programs etc.) focused on cleantech supply chain development, innovation and resource efficiency.
2. Amend the existing flow-through share program to better support cleantech material process innovation, development and ultimately commercialization.

The outcome of this would be to allow cleantech material companies (and downstream process innovators) to raise the capital necessary to pursue the innovation and process development that leads to the scaling up and commercializing of the resultant technologies and ultimately the capturing of international market share in rapidly growing global cleantech value chains.

Yours sincerely,

Brian St. Louis
Coordinator
Ontario Cleantech Materials Group