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Canada's resource industries & the knowledge-based economy: Proven global innovation

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Ever since science policy moved from the periphery to the centre of Canadian economic policy, conventional wisdom has it that we need to transform from a resource economy to a knowledge-based economy. Now science policy is termed innovation policy, and growing evidence on true innovation suggests that it is not a transition that is required, but rather, a need to build on our comparative global advantage in resource industries to create a true innovation-based economy.

For example, in the oil sands sector, a dramatic development, in the form of Canada's Oil Sands Innovation Alliance (COSIA) is providing such compelling evidence. New made-in-Canada models of collaboration are defining the global standard on how innovation works best, resulting in a growing awareness that resource development is not the opposite of, or even an impediment to, the knowledge economy. Quite the contrary. Natural resources development provides a country like Canada with a critical stimulus necessary for true innovation and an important underpinning to knowledge-based economic growth across all sectors.

About four years ago, stemming from a desire to accelerate their pace of environmental improvement, oil sands producers established a collaborative consortium designed to leverage technical resources and expertise in key environmental areas. They also agreed that through this consortium, they would share the risk of investing in the research and testing aimed at developing leading edge environmental technology capabilities.

Thus, COSIA came into being in 2012. Although some oil sands producers had been cooperating since the late 1970s, the creative approach that COSIA took to acquire the needed technologies and transform the sector into a component of the knowledge economy is what is truly innovative.

One COSIA innovative element is its Associate Membership Program, whereby organizations (e.g., large multinationals like General Electric, universities, government agencies like Natural Resources Canada or Alberta Innovates, or technological 'hubs', such as British Columbia Innovation Council or Climate Change and Emissions Management Corporation, among others) would sign on to source technological capabilities within their networks that align with the oil sands producers' priority technical gaps and challenges.

These gaps are themselves associated with key areas of leading-edge technologies developed for purposes other than oil sands development. High-tech sensors, nanomaterials, sophisticated algorithms and other forms of advanced intelligence systems are finding their way at a faster pace into this key Canadian industrial sector in a flurry of 'technological diffusion' that has little precedence in Canadian corporate history.

SOURCING ISRAELI TECHNOLOGIES

One example of this creative approach is the sourcing of advanced technologies from Israel, renowned

internationally as a country consistently at the crest of the wave of every generation of new transformative, or 'disruptive' technologies.

In June 2014, COSIA unanimously accepted a new Associate Member, the Canada Israel Industrial Research and Development Foundation. CIIRDF is itself an innovative structure, with a mandate to support Canada-Israel cooperation in technological development.

As a COSIA Associate Member, the mission of CIIRDF was to evaluate the dozens of technological gaps of the COSIA members across four environmental priority areas (water, land, greenhouse gases and tailings) and identify Israeli capabilities specifically suited for further co-development with COSIA member companies.

In February 2015, CIIRDF arranged for a site visit to Israel by COSIA engineers in which over 100 Israeli scientists, engineers and entrepreneurs were involved in evaluating the applicability of Israeli technologies to the gaps. Since Israel has no oil industry and only a nascent, and offshore, natural gas sector, all of these technologies emanated from other sectors, including defence, security, bio-medical and cleantech.

By the Fall of 2015, Israel had become one of the largest single sources of new technological 'offers' for consideration by COSIA members, with over 25 new technologies under review.

This approach is being repeated this year with the promise of similar results. The resulting "research harvest" exposes Canada to technologies that would have cost hundreds of millions of dollars to develop on its own. And because oil sands companies are collaborating with other sectors like forestry and mining, technologies sourced in Israel can find their way into many sectors.

For Israel, the CIIRDF membership in COSIA provides innovative and direct access to the oil sands value chain and eventual market, thus extending the economic return on its breakthrough technologies developed in other sectors.

For Canada, this global sourcing of oil sands priority technology needs provides technological capabilities in advanced multi-disciplines. And, the COSIA members and their value chain are now interconnected with a global leader in technological innovation and through this, becoming one of the most knowledge-driven sectors of the Canadian economy. It's clear evidence that Canada's oil sands industry is truly resourceful and provides valuable learnings for innovation policy and practise.

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