Canada's Innovation Agenda
Building on our Natural Resources Advantage
The 14th Annual RE$EARCH MONEY Conference
National Arts Centre, Ottawa | 31 March - 1 April 2015
Day 1 - 31 March 2015

Keynote

Canada's S&T/Innovation Policy: To be or not to be?

David Watters, CEO, Global Advantage

Referring to his title and the allusion to Hamlet's reflection on dealing with life's challenges, Watters began by suggesting that Canada is on the wrong path to building a well performing innovation system. Nor does he foresee any kind of top-down solution to this problem coming from government. Instead, the only way forward will be a ground-up strategy based on individual decision-makers.

Watters defined innovation in four distinct ways, according to the OECD Oslo Manual, as a product, process, marketing method or organizational method that is new or significantly improved in some way. Activities related to innovation take place in a business or within an innovation system, which he went on to describe. These activities have ancient roots, as demonstrated by artifacts thousands of years old, which speak to changes in tool design or information recording that represented significant changes in the way people worked and lived.

In this context, an innovation ecosystem consists of public and private institutions that support various aspects of this activity. The result could be new knowledge or technology, which is subsequently disseminated within businesses that bring this change to global markets. The key stakeholders in this system are therefore government, private firms, academic institutions, and customers.

Looking specifically at Canada's innovation ecosystem, Watters outlined five participants: federal government, provincial government, universities and colleges, the private sector, and global markets. These are linked through various programs providing support for R&D, but he regarded colleges and universities as the "jewel" in the system. "They permit the translation of terrific talent into the system," he said, referring to some 500,000 graduates a year who emerge from these places. He added that this new talent overshadows the intellectual property that is turned out by the same institutions.

With regard to how these activities reach out to global markets, Watters insisted that the vital question is whether employment is being created within Canada. "If you're not creating employment in Canada, I would debate how effective an innovation system you have."

Innovation matters, he argued, because it can improve business productivity, which through better processes, organization or marketing can improve our competitiveness, standard of living, and quality of life. However, Watters maintained that Canada's innovation ecosystem is weak, obtaining low rating in domestic and international rankings and early critical comments from significant observers such as the Prime Minister and the Deputy Minister of Industry Canada.

Watters then introduced his printed graphical illustration of Canada's innovation ecosystem, which he would ultimately like to post on-line as a wiki in order to hone it

further. One end of the structure included the federal government and its granting councils, as well as the provincial government and their pertinent departments. Another part of the organization was made up of 48 National Centres of Excellence, which serve as a bridge between the academic sector and the private sector. Finally, this representation offers the economic, social, and environmental outcomes from the system. This document also outlines six major funding sources for R&D in Canada, as distinct from the destinations for that funding, where the R&D work is being done.

"We've got a $30 billion research and development system, we have about a $32 billion university system, we've got $10 billion every year being put into this system by the federal government — if we're not satisfied with the outcomes that we're getting, then it's really up to us to decide how we could change this over time."

Watters presented a graph that clearly portrayed the country's declining R&D expenditures, as reflected in a drop of the proportion of that expenditure relative to GDP (GERD/GDP) from 2.01% in 2004 to 1.57% in 2014, even as the OECD average for GERD/GDP was increasing to 2.4%. "There is a very significant gap there in our performance. The question we have to ask is: is this the path we want to be on? Maybe it's acceptable to us and maybe it isn't, and if it isn't what do we want to do in terms of changing it?"

Other countries have in fact changed their approach, as illustrated by a more subtle graphic representation of scientists and engineers in the population in relation to GERD. "If you were to add a dynamic to this you would see many countries actually increasing their capability as Canada is decreasing its capability." This raises secondary questions about whether we will have the talented individuals necessary to understand and implement innovations that could benefit our way of life. Watters' innovation map also includes a report card ranking the country's performance in key areas.

Looking more closely at specific government data, he considered information from Natural Resources Canada on the performance of the forestry and metals and minerals sectors. "I found remarkable the economic impact and the amount of innovation that is going on in each one of these sectors and their importance to Canada."

Meanwhile, he noted the high ratio of indirect versus direct support for R&D, with some $3.6 billion available in tax breaks as opposed to just $356 million going toward dozens of programs for private sector innovation. He added that it has been some 25 years since the country undertook a formal review of the policy that drives this ratio. The list of federal programs that represent direct R&D investments can be arranged like the periodic table of the elements, each with its own distinctive characteristics.

Another contrast Watters noted was between the amount of federal R&D support that annually goes to universities (about $3.2 billion) and to colleges (about $71 million). In

light of the overall underfunding of the system, he suggested that evening up this ratio might be a good point of discussion. He also broke down provincial support for R&D and illustrated provincial levels for BERD, which showed Ontario underperforming in comparison with Quebec. This contrast pointed to a larger shortcoming he found in Canada's R&D policy.

"We don't understand the private sector very well from the point of view of public policy making," said Watters, who offered the example of a respected Industry Canada survey that excludes any firm with fewer than 20 people on staff. "That is 87% of all firms in Canada. You're doing a survey and drawing conclusions on the basis of a population of only 12.7% of the firms out there. I'm not sure that's going to help you in terms of many aspect of your policy making."

Similarly, he noted, when the Council of Canadian Academies studied industrial research and development, they did not survey the private sector. "I just find that strange. I would have thought that you would try and find out from the private sector how you are innovating, how much time to spend on it, what resources you put into it, and so on."

Watters examined the prominent role of SMEs, which make up 99.9% of all firms in the country, which only has 1,568 large enterprises. Interestingly, in the 2013 Globe and Mail survey of the top 1,000 companies in Canada, fully 524 were in the natural resources and energy sector. In contract, just 23 were in advanced manufacturing and 33 were in information and communications technology. Similarly, the revenue for companies in natural resources and energy likewise dwarfed that of other sectors.

In answer to the question of why Canada's innovation ecosystem is performing poorly, Watters blamed a lack of clear targets for this system (such as increasing employment or exports) and the decline of funding toward the essential activities of the system. In addition to an inadequate understanding of how the private sector is structured, he also cited the excessive focus on R&D, which is just a narrow portion of the broad range of activities that make up innovation. Finally, he noted a lack of federal-provincial coordination in matters of innovation and an absence of support for firms that try to move into international markets.

As for improving this ecosystem, Watters would like to start with a target, even something as arbitrary as creating 500,000 new jobs, which happens to be the same as the number or new graduates each year. This target could be achieved by exporting new, innovative products to global markets, which will be enabled by collaborative networks dedicated to promoting innovation and taking advantage of the entrepreneurial ambitions of graduates. Learning to manage those networks is therefore a primary challenge, which starts with each of us.

“I think we need to focus a little less on technology and more on how to structure and align effective collaboration systems,” he said, offering up the iconic example of Mennonite neighbours who readily build barns for one another in short order.

Watters was asked a key question by Gary Bunio, General Manager of Technology Development for Suncor. “We talk tremendously about innovation at the front and the back end of the conversation. In the middle we talk about R&D, and that language is very different. So what’s missing in this conversation that allows this to be?”

Watters replied that other members of the OECD have been addressing this distinction, studying knowledge based capital and other aspects of innovation that transcend the role of R&D.

Jeffrey Crelinsten added that the reason R&D garners so much attention is the same reason someone looks under a street lamp post for keys that were lost elsewhere — the light is better there. “Because we can measure R&D we talk about it and people are struggling with how you measure this other stuff. I’m convinced there are ways to measure it and the OECD, for one, is working on that.”