Achieving Better Balance:
Improving Canada's Innovation Performance with Balanced Initiatives

Submission
Review of Federal Support to Research and Development
Perspectives from a Provincial Research Organization
February 18, 2011

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Executive Summary

The Research and Productivity Council is New Brunswick's Provincial Research Organization (PRO). PROs are provincial crown corporations mandated to assist industry with their research and technology needs. Contrary to popular opinion, our experience illustrates that business is indeed interested in research, technology and innovation; however, they are challenged by the lack of incentives and support to pursue their interests.

Canada needs strong innovation performance to remain globally competitive and it is encouraging to see frequent, and passionate, discussion about innovation. However, much of this effort and energy has been directed at reviewing symptoms of Canada's technology-push strategy for innovation. After decades of failing innovation performance (see Figure 1), it is time to look past the pleas for more money, more time and even finger pointing to assign blame for Canada's lackluster innovation performance. It is time to revisit our strategy and resolve root-cause issues.

The following submission discusses improving Canada's innovation system and performance through balance: balance in supporting market-led (pull) research; balance in providing direct support for business expenditure on research and development (BERD); and finally, balance to include industry representation for innovation policy discussions and reviews.

REPORT CARD

Innovation

	1980s	1990s	2000s
Australia	D	D	D
Austria	D	D	D
Belgium	C	C	C
Canada	D	D	D
Denmark	C	C	C
Finland	D	C	C
France	C	C	C
Germany	C	C	C
Ireland	C	B	A
Italy	D	D	D
Japan	B	B	B
Netherlands	C	C	C
Norway	D	D	D
Sweden	C	B	B
Switzerland	A	A	A
U.K.	C	B	B
U.S.	B	B	B

Source: The Conference Board of Canada.

Figure 1: Grades for innovation performance; Canada has had a "D" for over 30 years.

Balance technology-push and market-led research

Efforts to improve Canada's well-documented failing innovation performance have focused on increasing fundamental research activities through the introduction and enhancement of numerous programs designed to facilitate technology-push. As noted in Eco-Innovation Policies in Canada[1], most Canadian initiatives fund research and development in a technology-push approach. Canada's Innovation Strategy introduced in 2002 further enhanced technology-push programs with tri-council funding and numerous other funding initiatives leading to record government budgets for research. These initiatives have helped to propel Canada to a leadership position in academic research[2]. However, our innovation performance continues to fail and we are no closer to our goal of a fifth-place ranking identified in our 2002 innovation strategy.

As evidenced by Canada's impressive ranking for academic research, our technology-push strategy (see Figure 1) has benefitted from the introduction or enhancement of numerous programs. Meanwhile, market-led research continues to rely on two basic programs: IRAP and SRED. Frustration with disappointing results despite significant research investments, has led to the modification of many technology-push programs to include a commercial vision and require endorsement or contribution from a commercialization partner. While it is generally useful for fundamental researchers to have a commercialization vision, these program adjustments should not be misinterpreted as funding for market-led research. The programs continue to be driven by academics often involving lengthy proposal and review cycles that are not well suited for the competitive business environment and often containing criteria, such as requirements for the composition of the project team, which may or may not be in the best interest of the initiative. Programs that support market-led research avoid these restrictions; as noted above, these are mainly IRAP and SRED.

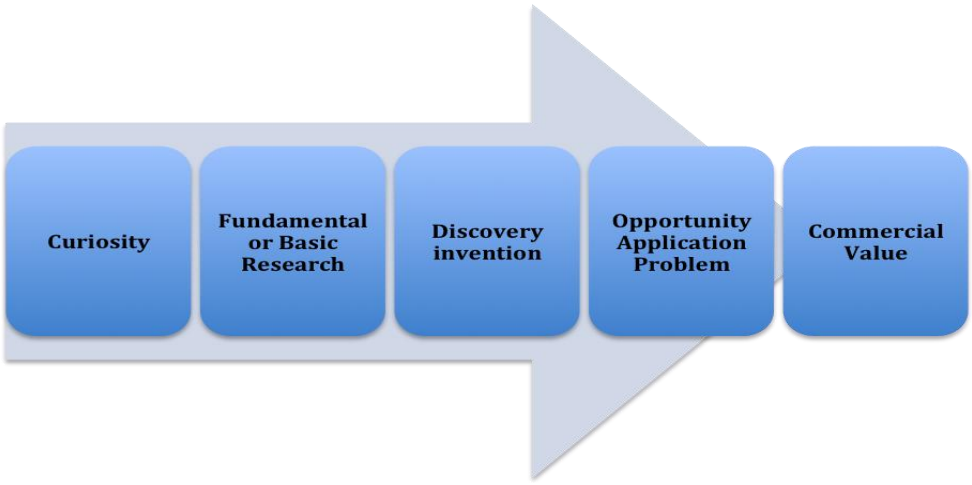

Figure 2: Classic Technology Push

[1] "Eco-Innovation Policies in Canada", *Environment Directorate*, OECD, 2008.

[2] "Science and Engineering Indicators", OECD, 2008.

The investments in technology-push initiatives have generated a rich library of knowledge, discoveries and inventions; however, as evidenced by our performance, the flaw in this strategy is to assume that increased knowledge and discovery will automatically increase innovation. In his book, "The Elegant Solution, Toyota's Formula for Mastering Innovation", Mathew May reports that since 2000, the United States Patent and Trademark Office approves an average of 182,585 patents annually[3]. However, only 365, or 0.2%, of these go on to become useful innovations. The point is, it is unreasonable to expect a high rate of commercialization from fundamental research and unfair to expect businesses to readily acquire and commercialize solutions for technology they may have never sought. There are successes but there should be little surprise that there will be a low commercialization rate; we now have an abundance of data to support it.

As policy makers, frustrated with multi-billion dollar investments and sparse results, question why results are not better, they are being presented with two common explanations. First, they are being told that innovation takes time and money. To get more results, you need to provide more time and more money. The second defense is to blame business for not being receptive to innovation, not investing in research, and not taking interest in the wealth of discoveries and knowledge that has been generated from years of investments in basic research. [4] This is not a subtle attack, as evidenced by Jeffery Simpson's summary of the Canadian Council of Academies' (CCA) report on productivity: "… the Council of Canadian Academies report points the finger of blame squarely at Canadian business." [5] One can understand the passion for defending the hard-fought increases for academic research funding but the temptation for assigning blame is evidence of the mounting frustration for lackluster innovation performance.

As Canada enters a fourth decade of failing innovation performance, it is fair to suggest there are fundamental flaws in innovation policy that more money and more time are simply not going to fix. To correct Canada's innovation performance, a change in strategy is needed. We cannot continue to stimulate supply of knowledge and discovery without stimulating demand. The natural incentive for demand is profit but some additional incentive is needed to increase BERD in a resource-rich country.

Fundamental research is an important element of our innovation infrastructure. However, we do need better balance including effective programs to stimulate market-led research (see Figure 3). There is evidence that business responds when these incentives are available; for example, the recent doubling of IRAP's chronically underfunded budget saw business continue to fully exhaust available IRAP funds by the end of the first quarter. This directly contradicts the suggestions that business is not interested in research and development. Programs that enhance market-led research will lead to more commercialization and will also have positive impact on the demand for the discoveries and inventions we have been producing.

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[3] Mathew E. May, The Elegant Solution, *Free Press*, New York, 2007, p. 51.

[4] "Council Says Canadian Business Weak in R&D", CBC News, May 5, 2009, http://www.cbc.ca/technology/story/2009/05/05/tech-090505-research-funding-report.html

[5] Jeffery Simpson, "Needed Urgently: more creativity from the business class", *Globe and Mail*, May 25, 2009, http://www.theglobeandmail.com/news/opinions/urgent-more-creativity-from-business/article1152455/

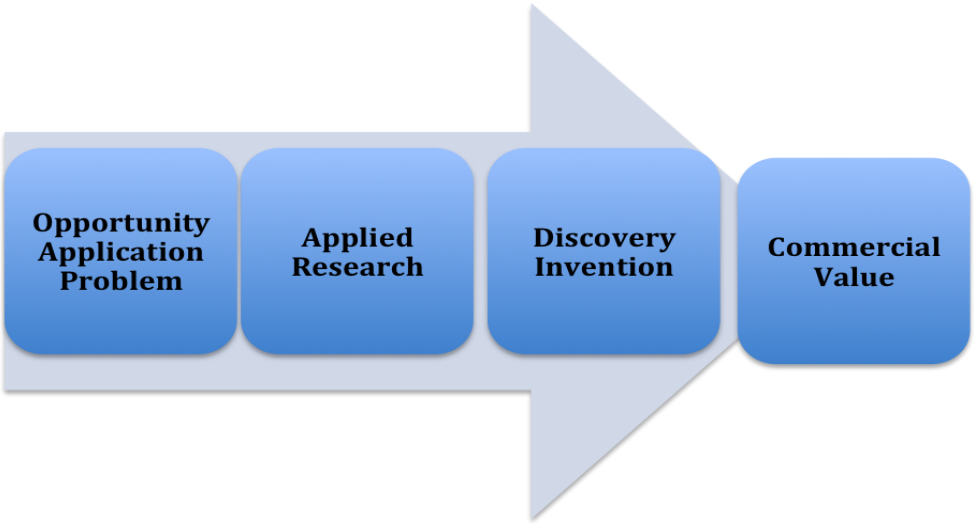

Figure 3: Market-Pull Research

Balance of Direct and Indirect Incentives

Canada's two major programs for funding BERD are IRAP and SRED. IRAP is a direct funding type program and an incentive for business to pursue innovation. However, at a $100 million (temporarily $200 million) annual budget, it is dwarfed in size by the multibillion-dollar SRED program.

SRED, being a tax credit, is more of a reward program than an incentive program. Recent criticism of the SRED program has resulted in fierce defense of the program. This is understandable as it is really the only major program for business and one would expect industry to defend it. However, a strong defense should not be misinterpreted as an endorsement of effectiveness. The SRED program needs a comprehensive effectiveness review under the premise that adjustments or replacement would be with an alternate program of direct support for business-led research.

OECD considers tax credits as indirect support. Figure 4 presents a chart showing direct and indirect government support for BERD. Canada's balance of direct and indirect support heavily favours indirect, as one would expect given the significant budget for SRED. When looking at a top innovation performer, such as the United States, there is significantly more direct support for BERD. Regardless of any potential changes in SRED, Canada must move to balance the direct and indirect incentives for BERD.

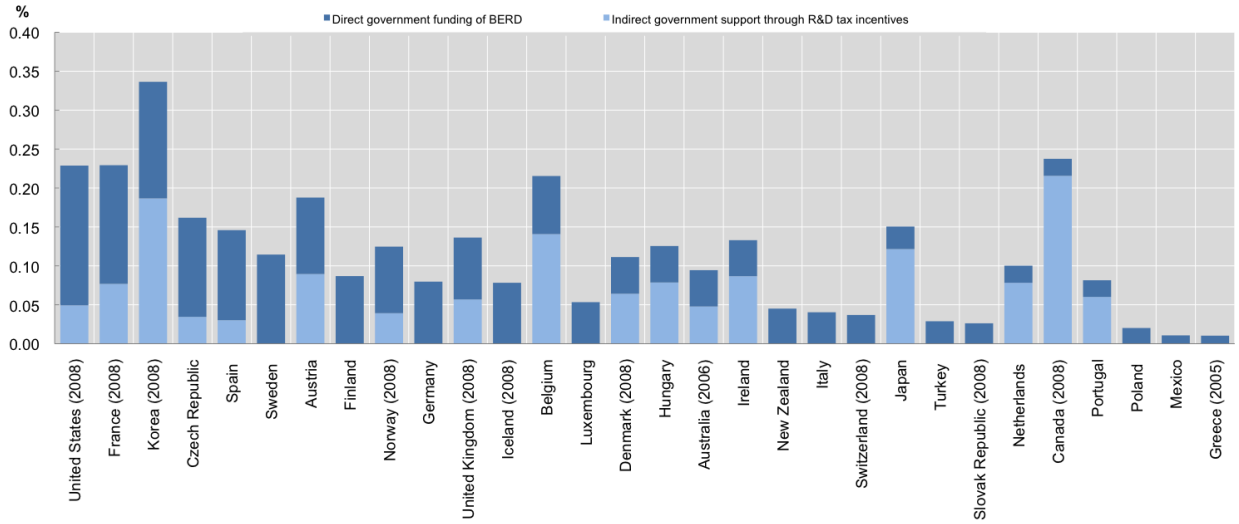

Figure 4: Direct and Indirect Government Funding of BERD

Balance of Representation in Reviews and Policy Making

Canada's failing innovation performance has provoked numerous reviews of research programs and consultation with experts on innovation. While many of these reviews conclude that Canada's innovation woes are caused by industry (through inadequate investment in research or lack of interest in discoveries), industry is not well represented on such reviews, panels and commissions. Perhaps the failure to have industry representation for innovation reviews perpetuates Canada's unbalanced innovation strategy that has remained focused on technology push despite decades of failing results.

There is widespread acknowledgement that industry has an important function in the innovation process. It would be most appropriate to have industry representation on the review panels. For example, representation from the Canadian Manufacturers and Exporters would seem essential for any valid review of Canada's innovation performance.

Conclusion

Canada has an opportunity to solve root-cause problems of our innovation performance through balancing current initiatives by:

1) increased focus on market-led (pull) research
2) increasing the amount of direct support for BERD
3) including industry representation for innovation policy development and review.