

August 15, 2008

**Polytechnics Canada submission to the House of Commons Standing Committee  
on Finance's 2008 Pre-Budget Consultations**

Executive Summary

The federal government has acknowledged in *Mobilizing Science and Technology to Canada's Advantage* that in order to remain competitive, the Canadian private sector must be encouraged to compete on the basis of innovative products, processes, services and technologies.

To achieve this Canada must maximize the amount and quality of applied research conducted in Canada, particularly by Canada's small and medium-sized businesses (SMEs). SMEs need speedier access to research and development that responds to their lack of research infrastructure and which is provided through a platform that acknowledges the inherent challenges that they face.

Canada's polytechnics represent an underutilized resource that could improve the capacity of SMEs to enhance and expand their commercialization activities. The seven members of Polytechnics Canada - BCIT, SAIT Polytechnic, Conestoga College, George Brown College, Humber College, Sheridan Institute and Seneca College – offer specialized applied research capacities that could be leveraged to provide collective solutions to Canada's research priority areas through a platform responsive to the needs of SMEs.

Polytechnics Canada, therefore, recommends that:

**Budget 2009 provide \$21 million for a three - year pilot project to create distributed research clusters, in three priority research areas, operating as Polytechnic Applied Research Networks (PARNs) focused on finding solutions to industry problems ranging from proof of concept projects, prototyping, field testing, and new and improved manufacturing processes.**

Each PARN would operate through centralized network coordination and decentralized delivery of applied research activities through the research offices at the polytechnics. A centralized portal tool would triage client need and match it to potential expertise at polytechnics throughout the network. The SME would be directed to the appropriate polytechnic research office(s) where the applied research and problem solving would be conducted.

The funding would be a dedicated pool of predetermined resources for research projects. The funds would be distributed to projects that meet predetermined criteria after project proposals were reviewed by an expert panel. This innovative approach would be used intentionally to fund research proposals that respond to the immediate needs of SMEs and accommodate rapid project development from conception to commercialization. Project timelines from the proposal concept stage to funding would range from 4 weeks to 12 months in duration.

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## Introduction

Polytechnics Canada welcomes this opportunity to provide input to the House of Commons Standing Committee on Finance's 2008 Pre-Budget consultations.

Polytechnics Canada is an alliance of seven large, internationally recognized post-secondary institutions committed to producing career-ready graduates which combine critical thinking with theoretical understanding and practical competence. The seven members are located in regions that drive the Canadian economy: The lower Fraser Valley, the Calgary/Tar Sands corridor, the Golden Horseshoe and the Kitchener/Guelph/Waterloo high-tech triangle.

Collectively, the seven members - BCIT, SAIT Polytechnic, Conestoga College, George Brown College, Humber College, Sheridan Institute and Seneca College – annually educate more than 400,000 highly-qualified people essential to Canada's economy by:

- providing career-focused and community responsive education developed in partnership with employers;
- committing to a wide range of credentials including bachelor degrees, diplomas, apprenticeships, certificates, post-graduate offerings, continuing education and corporate training, spanning many fields;
- offering pathways that allow students to build on their credentials; and recognizing previous learning; and
- combining theoretical and applied learning, relevant work experience, and the opportunity to participate in applied research and commercialization projects.

The applied research conducted at these institutions is driven by the need to solve industry identified problems. From the perspective of Polytechnics Canada, applied research means:

- Research activities based on industry needs aimed at specific commercial objectives. The industry driven activities include: proof of concept, prototyping, design, testing, product development, cost avoidance, incremental innovation, and other pre-commercialization activities, e.g., market assessments.
- Team-based multi-disciplinary projects (rather than one lead researcher)
- Researchers with industry experience: solving industry problems (related to design/development, process engineering/optimization, production, quality assurance, environmental and regulatory issues), commercialization, and licenses (rather than academic journal publishing records and PhDs)
- Hands-on student involvement at the undergraduate level (rather than the graduate and doctorate level) producing research-ready graduates for the Canadian private sector.
- Accelerated applied research project schedules from conceptualization to commercialization.

In the continuum of research, applied research is essential to implement and sustain discovery-oriented basic research. Because of this, applied research achieves two national productivity goals: the transfer of technical and technological knowledge needed

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in today's workplace and the resolution of industry problems leading to commercialization.

### Applied research and benefits to Canada

In order to maximize the amount and quality of applied research in Canada, the federal government should focus on the sub-sector of higher education that most closely has applied education in its mandate: Canada's polytechnic institutions.

With an innovative new model of applied research support, polytechnics could also provide the important research and innovation expertise that will ensure Canadian companies leverage their own ideas and create jobs at home.

According to Statistics Canada, the private sector performed \$14.7 billion of research and development in 2005. But most of that money is being invested by the largest companies. Fewer than 300 Canadian firms invest more than \$3 million in research and development each year, and 10 of those companies accounted for 24 per cent of private sector research.

Unlike large companies with in-house research and development resources, most of Canada's small and medium-sized enterprises (SMEs) lack access to research resources and services. These firms do not tend to have the critical mass to allow a production line to be taken offline in a bid to experiment with a process or product.

To grow and compete on the world stage, Canada's SMEs need speedier access to commercialization services that respond to their lack of research infrastructure and which is provided through a platform that acknowledges the inherent challenges that they face.

Canada's polytechnics offer a powerful untapped potential to rapidly transform limited financial support into new businesses. Five years ago, for example, Sheridan Institute leveraged \$1 million from the Municipality of Oakville to establish a business incubator for digital industries. That has led to the birth of a major animation firm known as Pipeline Studios.

When students are hired to support applied research projects alongside their instructors, they are applying the theory of a classroom into real-world challenges, and using the latest technology that a workplace can offer. Polytechnics are there to provide Canada's SMEs with the real solutions they need, when they need them.

### Current obstacles to applied research

Despite the strong track record of success in applied research at Canada's polytechnics, there are urgent needs which the seven institutions have in common. These relate to capacity development and infrastructure investment.

#### *Faculty release time*

Polytechnics need funding to provide release time to enable teaching staff to conduct applied research activities. Currently, provincial operating grants in some jurisdictions fund only teaching time -- which means that staff do not have enough extra time to meet the demands of the increasing number of applied research projects. As a result,

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research offices in polytechnics cannot respond fully to the increasing demands for industry driven research projects.

#### *Infrastructure*

To conduct world-class applied research activities, polytechnics need expanded buildings, labs, and equipment in addition to faculty and technical support staff to run these facilities. Building on their existing applied research infrastructure to provide timely access to both researchers and industry partners, polytechnics need funding to enhance equipment in existing facilities and funding to expand existing facilities.

#### *Equipment*

Although industry partners are often willing to contribute some equipment, infrastructure funding is required to install, configure and maintain equipment as well as to modify facilities to receive the contributed equipment. Reliable funding is also needed to fill in the gaps and purchase additional equipment not readily available through industry contributions but still critical to an applied research process.

#### *Turn-key funding*

Polytechnics also need access to funding that acknowledges the rapidly-evolving technology sector and the immediate problems identified by industry. Ideally, the funding would be open-ended (i.e. no competitions) and drawn down over the lifespan of the fund. This innovative approach would be used intentionally to fund research proposals that respond to the immediate needs of SMEs and accommodate rapid project development from conception to commercialization. We anticipate project timelines from the proposal development stage to funding being 6-12 months in duration. Successful projects would go from funding to delivery of commercialization in as little as 4 months. This is markedly different than timelines associated with the existing Granting Council framework, which can take over three years from the concept stage to funding.

#### Recommendation for the House of Commons Committee on Finance

The federal government has acknowledged in *Mobilizing Science and Technology to Canada's Advantage* that in order to remain competitive, the Canadian private sector must be encouraged to compete on the basis of innovative products, processes, services and technologies.

The Science and Technology framework seeks to stimulate commercialization and private sector investment in research and development. Polytechnics Canada realizes that *Mobilizing Science and Technology* is a living document that sets the direction for higher education funding for science and technology in Canada and will be evolving over many years. On behalf of our members, we hope the Government of Canada will support applied research to a greater degree and on a more sustained basis in order to strengthen Canadian private enterprise and commercialization so that we can increase Canadian productivity and global competitiveness.

**Polytechnics Canada, therefore, recommends that Budget 2009 provide \$21 million for a three-year pilot project creating distributed research clusters operating as Polytechnic Applied Research Networks (PARN) in three priority areas of research for Canada.**

Polytechnic Applied Research Networks would work very closely with Canada's SMEs to conduct targeted applied research in response to industry identified problems. These

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industry identified problems would be met with solutions ranging from proof of concept projects, prototyping, field testing, and new and improved manufacturing processes.

Each network would operate through centralized network coordination (hosted by one of the polytechnics) and decentralized delivery of applied research through the research offices at the polytechnics.

The funding would be a dedicated pool of predetermined resources for research projects. The funds would be distributed to projects that meet predetermined criteria after their project proposals were reviewed by an expert panel. This innovative approach would be used intentionally to fund research proposals that respond to the immediate needs of SMEs and accommodate rapid project development from conception to commercialization. The pilot project funding model would be an innovative approach that would go a long way to remove many of the previously highlighted barriers to expanding applied research in Canada.

In the pilot project, an SME in the identified sector would require applied research and development support to meet present or future market demand. A centralized portal's Situational Analysis tool would allow the PARN to triage client need and match it to potential expertise at polytechnics throughout the network. From this the PARN will obtain an understanding of the market conditions, R&D needs, and context for the needed work and expertise, which allows it to respond nimbly to the request by clustering expertise on problems on an as needed basis. The SME would be directed to the appropriate polytechnic research office where the applied research and problem solving can begin. Project timelines from the proposal concept stage to funding would range from 4 weeks to 12 months in duration. Funded projects are expected to be completed within 6-12 months.

Canadian SMEs' scarce financial resources and limited access to qualified personnel, equipment and facilities often contribute to a limited capacity to become more innovative. Current government support programs in place for R&D do not provide comprehensive access to facilities, research staff and students who are able to work on short-term projects as partners with the SME to help them overcome these limitations. SMEs do not have money on hand to use for traditional matching contributions required by government-funded research projects. Leveraging requirements are a barrier for SMEs, which are better suited to make in-kind contributions of their employees' time and to provide open access to their facilities.

The PARN model provides the as-needed project-based funding to assist SMEs with their problems. The SME's in-kind contributions benefit the polytechnic as researchers and students at the polytechnic are given relevant problem-solving and research experience with a local company using the latest technologies. The SME benefits by receiving access to research-ready polytechnic graduates, access to research infrastructure they do not have, and new or improved products, processes and prototypes.

Polytechnics Canada invites members of the Committee visit the applied research offices of Canada's polytechnics to get an appreciation of the applied research projects currently underway.

Polytechnics are there to provide Canada's SMEs with the real solutions they need, when they need them.

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