POLYTECHNICSCANADA

Supporting Canada's green economy through small business innovation

Pre-budget submission to the
House of Commons Standing Committee on Finance

August 2, 2019

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Recommendation:

Invest $40 million/year in Canada's network of college-based innovation intermediaries to double the number of small- and medium-sized enterprises engaged in innovation activity, boosting Canada's green economy in the process.

Background

Canada is at an environmental crossroad. Known for its natural beauty, the country has been slow to transition to a low-carbon economy despite huge opportunities to improve systems associated with transportation, production processes, energy efficiency and agriculture, among others. Leadership in these areas stands to make Canada a preferred destination for tourism, immigration and business investment, but will also reap economic pay-offs as other countries seek to replicate successes. While pricing carbon may be a part of the solution, it is clear that additional measures will be necessary. One important partner will be Canada's small- and medium-sized enterprises (SMEs).

In December 2017, the Canadian economy was made up of 1.18 million businesses. Of these, 1.15 million (97.9 per cent) had less than 99 employees and the vast majority were even smaller: 73.4 per cent employed less than 10 people. SMEs are a major force in the Canadian economy – a force that must be central to solving Canada's biggest challenges. While SMEs face barriers to experimentation, their active commitment to doing so is essential to growth, productivity and widespread action on climate change.

To better exploit the talent resident in Canada's SMEs, Polytechnics Canada recommends the federal government invest in the infrastructure to support and encourage small-business innovation. Ensuring SMEs are positioned to develop new

Canada's polytechnics are working with partners across the country and across sectors to create and commercialize technology and products.

Sustainable Transportation & Infrastructure

RED RIVER COLLEGE

Red River College's Vehicle Technology and Energy Centre is facilitating the development and growth of new sustainable vehicle technologies. Specific areas of focus include the use of renewable fuels, improving fuel efficiency, and evaluating and demonstrating emerging technologies, with an emphasis on extreme weather conditions. Red River College recently partnered with the Government of Manitoba, Mitsubishi Heavy Industries, Manitoba Hydro and New Flyer Industries to improve the electrification of public transit, building a prototype electric transit bus.

products, improve processes and adopt new technologies offers considerable scope to improve energy efficiency and reduce greenhouse gas (GHG) emissions. This is where Canada's polytechnics come into the picture.

Polytechnic institutions are where small businesses come to innovate. In partnership with some of our most forward-thinking businesses and non-profits, Canada's polytechnics are focusing on renewable and clean energy, green construction, sustainable agriculture, the efficient production and transportation of goods, and more. Polytechnics are not only co-developing the tools, techniques and technologies that will make the transition to a low-carbon economy possible, but are ensuring these technologies get to market for wider adoption. Further, by engaging students in applied research projects, polytechnics are developing the diverse talent pool necessary to support a low-carbon future.

We encourage the federal government to invest $40 million/year in Canada's network of college-based innovation intermediaries, doubling the number of SMEs engaged in research activity and boosting Canada's green economy in the process.

Applied Research at Canada's Polytechnics

Both private and public sector partners come to polytechnics for productivity-boosting services and supports, including proof of concept, prototype development, technology adoption, design, field/lab testing and simulation, product development and

BCIT™ BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

The applied research team at the British Columbia Institute of Technology is leading research, development and demonstration initiatives aimed at enabling the wider the adoption of electric vehicles. Their Smart Microgrid and Energy OASIS programs support innovation in renewable energy and electric vehicle infrastructure. BCIT is also host to this year's EcoCity World Summit in Vancouver.

FANSHAWE

The Centre for Sustainable Energy and Environments at Fanshawe College was created to undertake applied research related to renewable energy technologies, including energy management, energy-efficient building design and retrofitting, transportation and sustainable communities, all in partnership with industry.

enhancement, and manufacturing process design. In 2018, members of Polytechnics Canada conducted innovation activity with 3,000 partners, produced 1,400 prototypes and involved 13,200 students on these projects. Involving students in real-world innovation activity builds both confidence and skills in our talent pipeline. This will continue to be critical to meeting and sustaining Canada's environmental goals.

Recommendation

To double the number of Canadian companies engaged in innovation activities (such as adopting new low-carbon technologies, making process improvements that lower GHG emissions, commercializing new products and building export capacity for those products), the federal government should invest $40 million/year in Canada's network of college-based innovation intermediaries.

Current funding mechanisms limit the degree to which polytechnics can proactively reach out to the small business community and, as a result, many SMEs don't know about the services and supports available to them. Because institutions rely on project-specific research grants, innovation capacity is at risk of under-utilization and knowledgeable research staff can be lured away between projects. Limiting support to program/project-specific funds inhibits an institution's ability to act as an ever-ready innovation hub.

Cleaner & Greener Energy

SAIT Southern Alberta Institute of Technology

SAIT's Centre for Energy Research and Clean Unconventional Technology Solutions brings reliable high-efficiency energy solutions together with unconventional and alternative energy. The Centre has 3 laboratories with space to test demonstration systems and catalyze partnerships with industry, regulators, communities of practice and others.

NAIT

The Northern Alberta Institute of Technology's Centre for Oil Sands Sustainability is a state-of-the-art research lab staffed by scientists, engineers and technicians. Researchers bridge the gap between existing environmental research and relevant solutions, taking ideas from bench to scale-up. The Centre addresses challenges related to tailings treatment, water management, greenhouse gas emissions and more.

A predictable, multi-year investment in innovation capacity will transform the value proposition of college and polytechnic applied research activity, ensuring the network stands ready. We anticipate this investment will also double the number of small businesses and non-governmental organizations engaged in innovation activity within 3 years. More businesses engaged means more are exposed to a new generation of talent through the work-integrated learning opportunities inherent in polytechnic applied research.

Improved access to innovation support will also complement existing business innovation investments intended to help Canadian firms, including programs such as the Industrial Research Assistance Program (IRAP), Strategic Innovation Fund (SIF) and the Innovation Superclusters Initiative. Similarly, this investment will complement multi-year growth in the College and Community Innovation Program, stimulating additional results such as:

- Streamlined analysis and triaging of business needs
- A national service standard for supporting business innovation and productivity
- Dynamic, client-centric services, including outreach to firms currently unaware of existing supports
- Increased national and international collaborations, promoting global best practices to combat climate change

Green Construction

ALGONQUIN COLLEGE

Algonquin's Construction Research Centre provides the construction industry with tools designed to support evidence-based decision-making and process efficiency. Sensors and software measure how well a structure performs to improve plans and designs, and increase energy efficiency.

GEORGE BROWN COLLEGE

The Green Building Centre at George Brown College connects industry to applied research with a focus on the construction, engineering and IT sectors. Facilities include the Advanced Prototyping Lab, the Building Materials, Science and Automation Labs, the Building Information Modelling Studio, and the Business Accelerator and Entrepreneurship space.

Monitoring Impact

Polytechnics Canada and its association and college partners are committed to measuring the impacts of this investment on a sector-wide basis. Measures could include:

- Progress to double the number of new partners and collaborations within 3 years
- Number of faculty and researchers employed or participating in innovation activities
- Increased investments in equipment and/or research infrastructure
- Number of new products, processes and innovative practices adopted
- Increased opportunities for talent development and experiential learning
- Increased private sector investment in R&D
- Value as assessed by client organizations and partners, including:
  - Increased firm revenue or decreased operating costs
  - At least 75% of clients report improved innovation capacity
  - Subsequent partnership requests

Sustainable Agriculture

KPU KWANTLEN POLYTECHNIC UNIVERSITY

KPU's Institute for Sustainable Food Systems is an applied research unit that investigates and supports regional food systems as key components of sustainable communities. Related programming provides information and support for farmers, communities, business, policy makers and others, with community collaboration central to the approach.

SASKATCHEWAN POLYTECHNIC

Saskatchewan Polytechnic's BioScience Applied Research Centre is home to a team of instructors and research personnel whose strengths include agricultural bioscience, analytical chemistry and molecular biology.

Sustainable Production

The Magna Centre for Supply Chain Excellence at Conestoga College works with partners to address Canada's productivity challenge and the urgent need for supply chain specialists. These skilled individuals address current and emerging business needs by applying integrative supply chain system thinking.

Sheridan's Centre for Advanced Manufacturing Design Technologies has a leading role in connecting industry, curriculum and applied research. The Centre links companies of all sizes to advanced manufacturing expertise and equipment, allowing them to explore tools with the help of faculty and students.

Located at Humber's North Campus, the Barrett Centre of Technology Innovation builds on expertise in areas such as automation, robotics, systems integration, user experience testing, applied research and work-integrated learning. Barrett CTI is also home to Humber's Advanced Manufacturing Skills Consortium, a group of 8 leading industry partners working with the college to train students and employees.

As mechatronics become critical to implementing automated processes, professionals with specialized training are required. Seneca has partnered with Siemens to develop the first Mechatronics Simulation and Demonstration Centre in Ontario, enabling applications ranging from automation and robotics to industrial maintenance and electro-mechanical technologies.

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About Us

Polytechnics Canada is the voice of leading research-intensive, publicly funded polytechnics, colleges and institutes of technology. Our mission is policy advocacy for federal action in innovation and skills. Polytechnics Canada members play a critical role in enhancing Canada's productivity. Through their facilities and networks, our members provide meaningful solutions to industry problems and accelerate knowledge transfer. Graduates are job-ready and armed with the skills employers need across sectors.

Close ties to industry make the polytechnic talent pipeline dynamic and responsive to the challenges of developing the future workforce. Polytechnics work with industry to build programs and design curricula, to conduct applied research that helps firms scale and get products to market. They offer students work-integrated learning opportunities and position graduates for careers. Beyond the traditional student, polytechnics embrace those at mid-career who find themselves displaced from the labour market or simply need short-term retooling to refine and modernize their skillsets.

At Polytechnics Canada, we are proud promoters of the polytechnic education model – applied, hands-on and technical; industry-focused and industry-driven.

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NAIT
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CONESTOGA Connect Life and Learning
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Seneca
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SASKATCHEWAN POLYTECHNIC
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