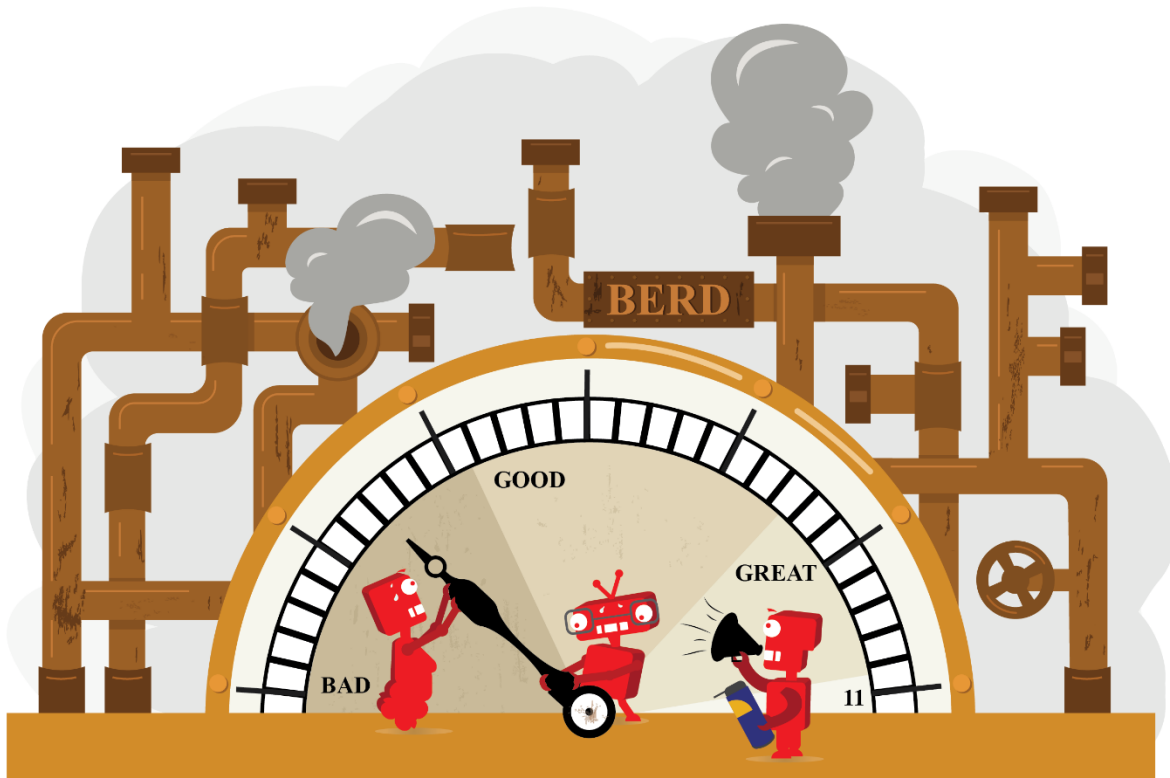


Canada's Technology Access Centres:
Amplifying impact through inclusive innovation



Written Submission for the Pre-Budget Consultations in Advance of the 2020
Budget

Submitted on behalf of Canada's Technology Access Centres by:

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Recommendations submitted for consideration for Budget 2020:

Recommendation 1:

That the government provide Tech-Access Canada with funding in the amount of **\$ 21 million over five years** to deliver programming related to the **Inclusive Innovation Initiative (i3)** delivered through Canada's Technology Access Centres.

Recommendation 2:

That the government expand SME participation in the R&D ecosystem with an investment of **\$40 million per year** in business innovation engagement services based in colleges, institutes and polytechnics, as recommended by the **College Applied Research Taskforce**.

For Canada to do its part to effectively combat climate change, there is a demonstrated need to enact mechanisms that contribute to a clean environment as well as a sustainable economy. Canadian firms need to embrace novel technologies that combat climate change, reduce greenhouse gas emissions, and protect the country's freshwater regions. These solutions need not be "new-to-world" and risk reinventing the wheel. With technology adoption assistance, Canadian firms are well positioned to import technologies from other jurisdictions and Canadianize them to develop uniquely Canadian applications. The current challenge, and that which has frustrated policy makers for decades is the nature of Canada's industrial makeup.

According to the federal government's most recent report, Canada has 1.1 million businesses and the average firm size is 8 employees. Canada also has fewer than 3,000 large enterprises, making up only 0.2% of all businesses, yet accounting for over 50% of all R&D spending. Comparatively, despite representing 98% of all firms, small businesses account for only 27% of total R&D spending. Canada has always been a country of small businesses, yet small business spending on R&D has declined consistently over the years despite the efforts of so many special committees, expert reviews, panels, and reports on Canada's lackluster innovation record.

Trying to transplant successful innovation and environmental technology adoption policies from other countries ignores Canada's history and industrial makeup. An economy of 98% small firms scattered across the second largest country in the world, with few scaling into medium-sized firms, and virtually no homegrown multinational anchor firms, shows that we are drastically different from our competitors, and therefore require different, uniquely Canadian solutions to support the environment we all share.

Canada has a highly-educated population and incredibly talented innovators and entrepreneurs from all backgrounds spread across all regions and all industries. Small firms often do not know that an entire network of objective innovation intermediaries exists to help them solve their innovation challenge through the adoption of novel technologies: **Canada's Technology Access Centres**.

A uniquely Canadian innovation that we should all be proud of, and the recent subject of an OECD case study, Technology Access Centres are specialized applied R&D centres affiliated with Canadian colleges or cégeps. Demand-driven TACs help Canadian businesses – especially small businesses – advance their products, processes and services by:

- conducting applied research and development projects focused on company problems;
- offering specialized technical services and objective advice; and
- providing training related to new types of equipment and processes.

Every year, the TACs provide clients and partners from across Canada with access to:

- expertise and experience of over 1,500 business innovation and applied R&D experts;
- over 3 million square feet of innovation and applied research space; and
- over \$300 million worth of highly-specialized equipment and facilities.

Canada's TACs are designed to be a safe-space for firms to de-risk the adoption of novel technologies, and they provide an accessible model that helps entrepreneurs and innovators exploit new opportunities for profit, bring new innovations to market, and realize their dreams in a one-stop-shop. Their industry-friendly Intellectual Property policies put the IP in the hands of industry to commercially exploit, a tremendous benefit for small firms hoping to stay nimble and expand.

TACs actively assist over 3,000 companies each year and members have seen an increasing number of the requests from firms wishing not only to adopt new technologies to become more innovative and productive on a micro level, but also positively impact Canada's environment on a macro level.

For example, in the Prairies, Ceres Solutions, a small, innovative and environmentally-focused company located in Olds, Alberta had the idea of growing mushrooms with brewer's spent grain to use as livestock feed. They had a small benchtop proof of concept, but needed a controlled environment in which to test the theory and develop a scalable process. They approached the Technology Access Centre for Livestock Production (TACLP) based at Olds College and collaborated to test this theory and found they were able to grow nutrient-rich mushrooms with spent brewer's grains, providing more protein to livestock at a reduced cost. This innovation improves feed efficiency while lowering methane emissions from livestock. At scale with millions of head of cattle, this innovation will benefit Canada by adding value to brewers' spent grains, while sustainably improving the feed efficiency of livestock and significantly lowering their methane and GHG emissions.

In Saint-Jérôme, Quebec, a small electric vehicle manufacturer, Lion Electric Company, had a vision to manufacture and market next-generation full-size electric school buses. Replacing a diesel school bus with an electric model reduces green house gas emissions by 23 tonnes per year. They approached the Innovative Vehicle Institute, a Technology Access Centre affiliated with Cégep de Saint-Jérôme, and collaborated on the design of a very large rechargeable energy storage system adapted to Quebec's climate. Lion Electric has since manufactured and sold dozens of full-size electric school buses, and has expanded their product line to commercial buses and trucks. At scale, this innovation will benefit Canada by reducing millions of tonnes of GHG emissions across the country by replacing diesel school buses with electric versions. The benefits grow exponentially when the technology moves to other commercial trucks and vehicles.

As word limits constrain us, the two preceding stories are merely a sample of how small firms had a vision, but couldn't do it alone. We have many more examples of projects that are a win for the company, a win for the environment, and at scale, will be a win for Canada. Like their affiliated colleges and cégeps, TACs are institutions of inclusion by design, assisting diverse communities. Like colleges, TACs are client agnostic and personify inclusive innovation, eager to work with any innovator or entrepreneur who knocks on their door with an innovation challenge.

Tech-Access Canada and the TACs are guided by the philosophy that “anyone can innovate”, and “innovation is for everyone”.

Unfortunately, many federal R&D support programs have tightened eligibility criteria to screen out smaller, or newer, firms. Our members have noticed that this undeservedly impacts firms led by members of traditionally under-represented groups, keeping them on the sidelines of innovation. Our commitment is to provide access to innovation support services for all Canadians.

In the same way that Canada’s 47 TACs are designed to be safe spaces for de-risking innovation, the TACs’ network - Tech-Access Canada - is a safe space for policy innovation and experimentation. Established in 2015, Tech-Access Canada is the formal, national network of NSERC-designated TACs. Tech-Access Canada administers a variety of initiatives including the Interactive Visits for SMEs program; the Jumpball Initiative; and Best Practice Workshops using the TACs as a dedicated team of service providers.

In that spirit, on behalf of Canada’s TACs, Tech-Access Canada is seeking an investment of \$21 million over five years from the Government of Canada, to be committed in Budget 2020, for the launch of programs in support of the Inclusive Innovation Initiative. Tech-Access Canada, together with the 47 Technology Access Centres across Canada, will leverage this investment facilitating technology adoption to solve the innovation challenges of over 1,000 companies; leverage more than \$30 million of business investment in R&D from small and medium-sized firms; and provide at least 500 paid Innovation Apprenticeships.

The Inclusive Innovation Initiative is comprised of three core elements and a brief overview follows (Supporting documentation is available from Tech-Access Canada):

1. TRLevation Projects:

Inevitably, innovators will hit a roadblock on their way to market and need assistance getting their innovation to the next Technology Readiness Level (TRL). TRLs are a measure to evaluate the maturity of an evolving innovation from Level 1: an idea on a napkin, to Level 9: a commercialized product on store shelves. For innovators who are not too proud to ask for help, TRLevation Projects will allow them to collaborate with a TAC to get around the roadblock. These small-scale applied R&D projects will have rapid approval and roll-out timelines to move at the speed of innovation. Being inclusive and open to everyone, the TAC validation and advancement facilitates follow-on R&D projects with the TAC or other innovation ecosystem partners better suited to get the innovation to TRL 9. We anticipate assisting innovative SMEs with at least 300 TRLevation Projects over the five years.

2. TAC Expertise Exchange:

The Expertise Exchange makes smart use of our Made-in-Canada TAC innovation talent and creates a formal mechanism to rapidly deploy the TACs' experts to a peer TAC in need of short-term assistance, reducing overlap and duplication of efforts, and getting innovations to market quicker. Support would enable TAC researchers to travel to another TAC to share their specific expertise as part of a team solving an industry partner's challenge. This is knowledge transfer in the most literal sense, benefitting regional economic development at a level that would take the TACs years to replicate organically. We anticipate deploying innovative TAC talent on at least 200 Expertise Exchanges to assist fellow TACs on their applied research projects over the five years.

3. Innovation Apprenticeships:

The Innovation Apprenticeships initiative will be modeled on the centuries old, very successful apprenticeship training model from the skilled trades, but fine tuned to encourage the mastering of the requisite competencies to be a mid-TRL innovator. The objectives of the Innovation Apprenticeships are two-fold: First, providing paid work experiences for young Canadians to acquire enhanced employability skills and advanced innovation skills, through a six-month term of mentoring and coaching from Technology Access Centre core research staff, as well as a six-month internship with a small Canadian firm. Second, developing, in parallel with representatives from the TACs, a formal apprenticeship-style program for tracking the acquisition of innovation skills and competencies with the goal of creating a new pool of mid-TRL innovation talent for innovative companies and organizations across the country. We anticipate providing Innovation Apprentices with at least 500 paid internship opportunities to acquire and refine innovation skills at TACs and innovative small firms.

While the overarching objective of i3 is to remove barriers for accessing innovation support services for Canadian entrepreneurs and innovators, the underlying motivation is to increase the production of mid-TRL innovation talent for regional talent pools. Increasing the number of interactions between innovators and TACs increases the number of potential projects, which increases the demand for innovation talent to deliver the projects at the TACs, as well as shepherd the results to market through the commercialization efforts of the firms.

Tech-Access Canada will administer the Inclusive Innovation Initiative using our secure, proprietary, TACPITS project-tracking platform, making project administration efficient and cost-effective, and standardizing the collection of performance metrics. We are also confident i3 will act as a catalyst to amplify the positive impacts of other government supported R&D and innovation assistance programs.

While still an emerging and inconsistent enterprise, college applied research has tremendous untapped potential across the country. There is a pressing need to develop and support consistent pan-Canadian college applied research capacity.

Tech-Access Canada and Canada's 47 TACs also fully endorse the **College Applied Research Taskforce's** Budget 2020 recommendation to expand SME participation in the R&D ecosystem by investing \$40M/year in business innovation engagement services based in colleges, institutes and polytechnics will enable colleges to bring new enterprises from every community and sector of the economy into the national R&D ecosystem for the benefit of all Canadians.

Thank you for your consideration.