



Group of Canadian Research Universities

Regroupement des universités de recherche du Canada

Research, Innovation and Talent: Key elements to Canada's road to recovery

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

August 5, 2020

Recommendations

1. Increase resilience and competitiveness through research

Ensure Canada has the R&D intensity to be a resilient, competitive knowledge-based economy and society by returning our R&D investments to 2% of GDP by 2026.

2. Establish strong, high-growth emerging technology sectors

Ensure that Canada is a leader in the next wave of high-growth, disruptive technologies by making targeted, high-impact investments in a limited number of initiatives at the nexus of commercial opportunity and research excellence.

3. Increase Canada's fundamental research and training capacity

Ensure Canada has the research capacity and workforce to respond effectively to future crises and to capitalize on emerging opportunities.

4. Build a more adaptable, resilient workforce

Increase the skill level, adaptability and resilience of Canada's labour force by providing direct support to Canadian degree-granting institutions to develop short stackable/micro training modules aligned with labour market needs.

5. Reduce emissions and support cleantech innovation

Support clean technology innovation and create clean technology jobs while reducing Canada's GHG emissions through the creation of the Green Campus Infrastructure and Innovation Fund. The GCIIIF would support projects that increase the energy efficiency of university campuses and decrease their carbon footprint. The complementary Innovation Accelerator supplement would help fuel clean tech innovation and create the workforce needed for low carbon prosperity.

Introduction

As difficult as these last months have been, it has shown the incredible power of Canadians, when armed with the best possible information, to pull together to keep our neighbours safe. Our hope is that this pre-budget process can help Canadians again pull together to tackle another major challenge: emerging from the crisis stronger and more resilient than we went in.

As Canada begins to cautiously emerge from the COVID-19 pandemic, we face a complex set of challenges. The significant increase in public debt means we will need to accelerate economic growth while at the same time transitioning to a low carbon and more inclusive economy. Our aging workforce, our middling levels of advanced degree attainment and our weak productivity growth add additional complexity to the challenge. Although the challenge is daunting, spring 2020 has shown us what is possible when Canada mobilizes around a clear set of objectives.

Universities have been proud to contribute to our collective fight against COVID-19 and look forward to contributing to Canada emerging from this crisis stronger than we went in. To that end, this document proposes five areas where we believe universities, along with their partners in government and the private and not-for-profit sectors, could make a significant contribution to achieving this goal. The five areas are:

1. Increase resilience and competitiveness through research;
2. Establish strong, high-growth emerging technology sectors;
3. Increase Canada's fundamental research and research training capacity;
4. Build a more adaptable, resilient workforce;
5. Reduce emissions and support cleantech innovation.

1) Increase resilience and competitiveness through research

Objective

Ensure Canada has the R&D intensity necessary to be a resilient, competitive knowledge-based economy and society.

Background

- Canada's share of R&D spending has dropped from 2.0% of GDP in 2000 to around 1.55% in 2018. This puts us at 20th in the OECD.
- Without government action, research investment by businesses and non-profits is likely to decline further over the next couple of years because of the pandemic. This creates a significant risk for Canada's long-term competitiveness as a knowledge-based economy.
- In the wake of COVID-19, countries around the world are increasing their investments in research and innovation. The UK government plans to double spending on research over the next 5 years and boost total private and public spending on R&D to 2.4% of GDP¹.

Proposal

Set a national goal of returning the proportion of GDP invested in R&D to 2% in 5 years. This will require universities, businesses, non-profits and governments to all work together to increase both research investments and the ROI from those investments.

¹ <https://www.gov.uk/government/publications/budget-2020-documents/budget-2020>

2) Establish strong, high-growth emerging technology sectors

Objective

Establish strong, fast-growing technology sectors by leveraging Canada's PSE research capabilities.

Background

- Innovation has been a long-standing challenge for Canada, as evidenced by our ranking in the Global Innovation Index (GII); Canada went from 8th in 2011 to 17th in 2019. During the same period, the United Kingdom moved from 10th to 5th, the Netherlands from 9th to 4th, and Germany from 12th to 9th.
- Leading American legislators are pushing a \$100 billion investment over 5 years into cutting-edge technologies like artificial intelligence, quantum computing, robotics and telecommunications². Germany is investing €500 million in support of university-business research partnerships because of the pandemic.
- Canada's Growth Council, the Boston Consulting Group, and the World Economic Forum have identified a variety of research-intensive fields³ that can create significant economic opportunity in many industrial sectors.
- Seizing these nascent, high-potential opportunities requires business/university/government partnerships that accelerate the mobilization of academic research.

Proposal

Canada invest in the next wave of high-growth, disruptive technologies by making targeted, high-impact investments in a limited number of initiatives at the nexus of commercial opportunity and research excellence, where:

- The potential global markets are predicted to grow quickly and be worth billions of dollars per year;
- Canada has truly world-leading research and our businesses have the potential to capitalize on the increased investment;
- Canada has the ability to capture a significant share of resulting high-value activity; and
- These efforts can enable Canada to attract and anchor the knowledge-intensive activities of globally mobile companies.

In partnership between universities, government and the private sector, these investments would support:

- pre-commercial research,
- training highly qualified personnel,
- entrepreneurship training programs,
- technology scouting,

² <https://www.defensenews.com/congress/2019/11/05/schumer-proposes-100b-tech-moon-shot-versus-china/>

³ AI, biotech, robotics, advanced materials, quantum computing, etc. Each of these technologies has the potential to support a variety of sectors such as agriculture, automotive, energy, environment, healthcare, etc.

- concierge-type services for businesses,
- etc.

These investments would be designed to strengthen the links between universities and businesses by deploying strategically focused on-the-ground resources. Universities are particularly well positioned to work with industry in the proactive search for new, transformative technologies (i.e., *technology scouting*). This would allow universities to leverage open innovation to help businesses bring products and services to global markets in a timely manner.

All proposals would need to demonstrate private sector support/involvement and complementarity with existing programs or initiatives. Where appropriate these strategies could focus on helping a locally important industry adapt to and/or adopt disruptive technologies.

3) Increase Canada's fundamental research and research training capacity

Objective

Ensure Canada has the research capacity and workforce to respond effectively to future crises and to capitalize on emerging opportunities.

Background

- Crises underscore the importance of having existing research capacity that is both broad and deep. The ability of the research community to quickly mobilize to help is predicated on having a strong, multi-disciplinary foundation. Without this foundation, our search for vaccines and treatments would take much longer and decisions about public health measures, income supports, mental health impacts and other aspects of our response would have been less informed and less effective.
- The same is true of our ability to pursue emerging commercial opportunities. Once theoretical research areas like artificial intelligence (AI) turn into commercial opportunities, Canada's ability to seize opportunities is dependent on having a solid research capacity in these areas. A country's research capacity is determined by the proportion of its people with world-class research training. Unfortunately, the proportion of Canada's population with a master's or PhD degree is very low - Canada ranks 26th in the OECD.
- Having a world-class research training environment that can help Canada close this gap requires both funding for university research and supports for graduate students.

Proposal

Expand Canada's **fundamental research and research training** capacity by:

- Increasing federal investments in Canada's Tri-Councils (NSERC, SSHRC and CIHR) by 30% over the next 4 years,
- Tripling the number of Canada Graduate Scholarships available for master's and doubling the number available for PhD students. We further recommend that their value be increased by 25%.

These investments will better position Canada to respond to the climate emergency as well as whatever other unforeseen crises emerge. It will also position Canada to capitalize on commercial opportunities (such as those identified in Section 2).

As the granting councils implement these new investments, special efforts must be made to ensure that they address the unique needs of equity-seeking and underrepresented groups.

4) Building a more adaptable, resilient workforce

Objective

Increase the skill level, adaptability and resilience of Canada's labour force through an agile micro-credentialing system.

Background

- Millions of Canadians lost their jobs and millions more saw a significant reduction in hours worked as a result of COVID-19.
- Statistics Canada noted that the job losses disproportionality affected women, young people, and "vulnerable workers".
- Beyond the immediate crisis, the changes associated with Canada's transition to a low carbon economy and with technological disruption make it critical that Canada develop a more agile system to support skilling, upskilling and reskilling.

Proposal

Enhance the Canada Training Benefit program by increasing the annual training credit and by providing direct support to Canadian degree-granting institutions to develop short stackable/micro training modules aligned with labour market needs. While focused on developing labour market competencies, these learning and training modules would also be designed to lead to reputable professional credentials, such as professional master's or professional certificates.

EDI should be an important consideration in the design of this initiative. The program should address the specific needs of women and members of equity-seeking groups.

5) Reducing emissions and supporting cleantech innovation

Objective

Support clean technology innovation and create clean technology jobs while reducing Canada's GHG emissions.

Background

- Canada's universities consist of an extensive network of labs, classrooms, residences and offices. Some of the buildings are new, high-efficiency buildings. Many of these new buildings are the result of recent federal infrastructure investments.
- Currently there is an estimated \$5B worth of shovel-ready campus infrastructure projects with significant energy efficiency/green campus elements.
- These needs range from the expansion and upgrade of bioenergy facilities to retrofitting/replacing old buildings and residences to enhanced energy conservation and recovery.

Proposal

To capitalize on this opportunity and directly reduce Canada's environmental footprint, we recommend that Budget 2021 create the **Green Campus Infrastructure and Innovation Fund (GCIIF)**. This \$2B Fund would support projects that increase the efficiency of university campuses and decrease their carbon footprint.

To help accelerate Canadian low carbon and clean tech innovations, the Green Campus Infrastructure Fund would be complemented by the Innovation Accelerator supplement proposed in the U15's [CanRISE](#)⁴ proposal.



Reduced emissions and increased resiliency by upgrading campus infrastructure

The Innovation Accelerator supplement would encourage institutions to be a lead customer for a new product or service from a Canadian SME. Having a university as a lead customer would help Canadian clean tech and green economy innovators establish credibility with potential investors and customers.



Accelerated growth of Canadian clean-tech SMEs as a result of having innovations validated by a reputable lead customer



Equip students with hands-on experience working with cutting-edge clean-tech solutions and enabling early adoption

The supplement would also encourage vendors to involve students in the implementation and testing of innovations. Involving students and

⁴ https://u15ca-my.sharepoint.com/:b:/g/personal/gilles_patry_u15_ca/EZrQpM_IG05ImivEd3vLJtkBBWj6TkXV4_wqZ2CSHFBsg?e=m0VFO7

researchers in the deployment and testing would help build our country's next generation of clean-tech workers by giving students significant hands-on experience in the deployment of new technologies.

This approach would complement the rest of the innovation-centric [CanRISE](#) proposal developed by the U15 prior to the COVID-19 pandemic.

Conclusion

As our country begins emerging from what we all hope is the worst of the COVID-19 Pandemic, we will face many challenges and opportunities for which we do not currently have all of the answers. By investing in research and strategic ways to mobilize it, we can set our country up for continued success. The proposals in this document aim to do just that. Research, innovation and talent are key elements to Canada's road to recovery.