

Confronting the Climate Emergency:
Unlocking the Full Potential of a Canada's Vast, Diverse
University Ecosystem

Written Submission to the Standing Committee on Finance
For the Pre-Budget Consultations
In Advance of the 2020 Budget

By the Université du Québec

July 22, 2019

Recommendation 1

Promote a more balanced distribution of public research funding to support a strong, diverse science ecosystem.

Recommendation 2

Support the development of science culture and evidence-based decision making and public policy making.

Recommendation 3

Integrate the funding announced for the National Research Council of Canada (NRC) and the federal laboratories with post-secondary institutions in all regions of Canada.

Recommendation 4

Create a national research fellowship program with fair access for undergraduate students from universities across Canada.

The Université du Québec network commends the government for its commitment to addressing the issue of climate change. Our societies are facing a fundamental challenge that demands bold action to transform our lifestyles and consumption habits, which are economic drivers in and of themselves.

This is a significant challenge for parts of Canada where the local economy is based on natural resource extraction. The effects of accelerated climate warming are especially pronounced in the Far North, as well as in coastal and maritime regions.¹

The urgency of the situation leaves no room for error. Canada needs to leverage all of its expertise, including its research professors, its students and the highly qualified personnel (HQP) employed by Canadian businesses.

Universities can play a key role in this society-wide response, provided the right conditions are in place to better support them in taking action. We have four recommendations to make in that regard.

Recommendation 1

Promote a more balanced distribution of public research funding to support a strong, diverse science ecosystem.

Half of Canada's university researchers and students are at small or medium-sized universities, often outside large urban centres. These universities are major players in the communities that are most vulnerable to climate change. Many of the industries in these communities are carbon emitters that will have to undergo a radical transformation for a greener economy.

The research carried out in these regions is vital for achieving that goal. Researchers are able to document the local effects of global warming from the environmental, social, infrastructure, etc. standpoints and devise locally adapted solutions. Their research helps inspire and train the next generation of HQP.

Their research is also a powerful driver of change, because it is often carried out in partnership with companies and municipalities that want to take part in developing solutions to the sustainability challenges they are facing. UQAM's and INRS's applied research on countering urban heat islands, ENAP's research on urban resilience, UQTR's research on alternative energy sources and UQAR's research on combatting shoreline erosion are compelling examples of how universities are helping communities tackle climate change.

¹ As noted in Canada's Changing Climate Report and a recent Court of Appeal for Ontario ruling on the carbon tax. Sources: https://www.rncan.gc.ca/sites/www.nrcan.gc.ca/files/energy/Climate-change/pdf/CCCR_FULLREPORT-EN-FINAL.pdf and <https://www.cbc.ca/news/canada/toronto/carbon-tax-court-case-day-2-1.5099211>

Because of their proximity to and historical roots in their communities, these universities play a key role in efforts to develop sustainable solutions to climate change. However, their potential is still underutilized.

Part of the reason is that it is very hard for these universities to access research funding. Public investments in scientific research are concentrated in about 15 Canadian universities. Though they account for only half of Canada's teaching staff,² these 15 universities received two-thirds of the funding awarded by the three councils, the Canada Foundation for Innovation (CFI) and the Canada Research Chairs.³ This data compilation does not include funding awarded under other programs (e.g. Canada First), which would have widened the gap even further.

Significant work is being done with and within the granting agencies to raise their awareness of this situation, and this work must actively continue if we are to maintain or enhance our vital research capacity across Canada. For instance, the Canadian Institutes of Health Research (CIHR) decided to sunset the Foundation Grant program after an analysis revealed a bias in the distribution of grants (bias based on gender, age, institution size and applicant's pillar of research). The Université du Québec commends CIHR for its courage and hopes that this insight will be applied to all programs.

As the Advisory Panel for the Review of Federal Support for Fundamental Science noted in its report, a diverse science ecosystem is key to ensuring a successful future for Canada. It is also important to overhaul the existing funding system to create greater balance, fostering better alignment between funding rates for small or medium-sized universities or those located in the regions and the proportion of Canada's teaching staff that they represent.

Recommendation 2

Support the development of science culture and evidence-based decision making and public policy making.

The Université du Québec network applauds the Government of Canada's decision to appoint a Chief Science Advisor (CSA). Her mandate and annual report demonstrate a structured approach that should add considerable value to the Canadian governance model. With climate change creating major public policy challenges for the Canadian government, the Chief Science Advisor's efforts to establish a national science advisory system are worth supporting. Similarly, to guarantee the systematic use of evidence to inform all decision making in this field, the Chief Science Advisor's initiative to rapidly appoint properly resourced advisors to each of the government's 202 departments and agencies is essential.

² <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3710010801>

³ Source: CAUBO, 2015-2016 data compiled by the Université du Québec

Recommendation 3

Integrate the funding announced for the National Research Council of Canada (NRC) and the federal laboratories with post-secondary institutions in all regions of Canada.

The Minister of Science wants the National Research Council of Canada to “transform how it does research.”⁴ Meanwhile, post-secondary institutions are struggling to hire research professors due to severe budget limitations. The \$2.8B reinvestment announced for 2018-2023 to upgrade the national network of federal research laboratories offers favourable conditions for reconciling those two needs.

There are three key elements that would promote synergy between the governmental and university research teams and maximize the impact of the investments on the science ecosystem, especially outside metropolitan areas:

- Staff mobility programs could facilitate connections between researchers by, for example, enabling universities to recruit federal NRC and laboratory researchers as associate professors for specific projects, thus enhancing their research, teaching and training capacity;
- Research partnerships would give the federal government access to research professors at universities located in the immediate vicinity of its laboratories who could contribute complementary expertise to federal research efforts;
- By making the laboratories accessible to graduate students and their supervisors, they would get an educational setting incorporating state-of-the-art infrastructure and opportunities to integrate scientific activities that respond to Canadian priorities and that are also relevant to their immediate environment.

These connections would help universities efficiently train a high-quality future workforce for federal laboratories, which are suffering from a shortage of qualified researchers. Furthermore, all Canadian regions with government research infrastructure would increase their capacity to propose solutions for tackling the challenges of climate change and transitioning to a greener economy.

⁴ http://www.ic.gc.ca/eic/site/131.nsf/eng/h_00000.html

Recommendation 4

Create a national research fellowship program with fair access for undergraduate students from universities across Canada.

In order to transition to a green economy, Canada needs a critical mass of competent people who will have to innovate to find solutions to complex problems by drawing on the latest knowledge. These skills are acquired through student-centred science education that maintains a balance between research and teaching. Universities are instrumental in providing that education.

This is a major undertaking, given that Canada is already lagging badly. With 34% of Canadians aged 25 to 34 having a university degree, Canada is far behind the leading OECD member countries (46%).

To increase Canada's competitiveness, there is an urgent need to empower students starting at the undergraduate level. Offering fellowships to introduce undergraduate students to the research world is a concrete and effective way to get young Canadians interested in pursuing science at university or in the industry.

Our recommendation includes:

- Expanding the *Undergraduate Student Research Awards* program and the *Experience Awards* (in industry) program that are currently offered by NSERC to include students in the fields covered by CIHR and IDRC.
- Broadening eligibility for Mitacs *Accelerate* internships to undergraduate students, the only category currently excluded from the program.
- It is estimated that expanding these opportunities to undergraduate students would require an additional \$92M in funding to be allocated to the existing programs.

To maximize the potential of this proposal, this opportunity should be extended to students across Canada, with the program funding distributed in proportion to the student population.

The Université du Québec network

As a fount of scientific discovery and a training ground for tomorrow's experts, the Université du Québec network is already involved in the economy of the future.

The network's 10 institutions play a key role in stimulating the transition and developing partnerships based on intersectoral measures. The 10 institutions are the Université du Québec à Montréal (UQAM), the Université du Québec à Trois-Rivières (UQTR), the Université du Québec à Chicoutimi (UQAC), the Université du Québec à Rimouski (UQAR), the Université du Québec en Outaouais (UQO), the Université du Québec en Abitibi-Témiscamingue (UQAT), the Institut national de la recherche scientifique (INRS), the École nationale d'administration publique (ENAP), the École de technologie supérieure (ÉTS) and the Télé-université (TÉLUQ).

Together, they are already making major contributions:

- Significant contribution to training highly qualified workers across Quebec, given that one-third of students in the regions would not have been able to go to university if their institution had not existed,⁵ that a large proportion of students are the first in their family to attend university, and that the majority of graduates choose to stay in the region where they studied. One in three university students in Quebec is enrolled at a Université du Québec network institution.
- Leading-edge research and training capacity in close to 50 cities across Quebec, thanks to 2,800 professors in all fields who have developed expertise in new niches that have taken on strategic importance.
- Numerous partnerships with diverse organizations (businesses, NGOs, public entities), fostering the creation of knowledge on issues that are crucial to our collective future and the accelerated dissemination of that knowledge to practice communities.
- More than \$5.7B in direct benefits for our economies, through operating expenses, students and visitors (\$2.3B), and increased productivity due to enhanced training for university-educated workers (\$2.7NB) and to research and knowledge transfer (\$0.7B).

The four recommendations are aimed at building this essential collective capacity in order to ensure a successful future for all parts of Canada.

⁵ 2016 ICOPE survey