UNIVERSITY OF ALBERTA
THE UNIVERSITY OF BRITISH COLUMBIA
UNIVERSITY OF CALGARY
DALHOUSIE UNIVERSITY
UNIVERSITÉ LAVAL
UNIVERSITY OF MANITOBA
MCGILL UNIVERSITY
MCMASTER UNIVERSITY
UNIVERSITÉ DE MONTRÉAL
UNIVERSITY OF OTTAWA
QUEEN'S UNIVERSITY
UNIVERSITY OF SASKATCHEWAN
UNIVERSITY OF TORONTO
UNIVERSITY OF WATERLOO
WESTERN UNIVERSITY

U15 Pre-Budget 2016 Submission

January 12, 2016
Revised

U15
Group of Canadian Research Universities
Regroupement des universités de recherche du Canada

About The U15

The U15, an organization representing 15 of Canada's leading research universities, plays a unique role in our society. U15 institutions generate and mobilize world-changing knowledge. We educate and inspire leaders, from our Nobel Prize-winners to our astronauts and prime ministers. We attract exceptional researchers, teachers and students, whose stellar accomplishments form the foundation of our nation's research and development capacity.

From quantum computing to oncology, and oceanography to the humanities, The U15's research strengths are as broad as its aims are high. U15 universities foster world-class scholarship that shapes and realizes our national and global public policy goals, informs strong industry partnerships, fuels social, cultural, economic and environmental innovation and advances Canada's international influence and effectiveness.

U15 institutions share a global orientation and seek out international partnerships with other top institutions. We belong to the Global Network of Research Intensive Universities and are a signatory to the Hefei Statement on the Ten Characteristics of Contemporary Research Universities.

EDUCATION	Educate **584,000** people annually	Attract **84,000** international students	Train **70%** of Canada's PhDs
RESEARCH	Perform **$8.5B** of research annually	Perform **79%** of sponsored research	Perform **83%** of business funded PSE research
IMPACT	Have **2,900** active technology licences	Receive **81%** of university patents	Create **90%** of university spin-off businesses

Introduction

The U15 Group of Canadian Research Universities is pleased to have the opportunity to make recommendations for Budget 2016. Acting on these recommendations will contribute to an innovation agenda for Canada and will strengthen our innovation economy through support for research excellence.

In our knowledge-based economy, many of Canada's competitive advantages are rooted in our strong network of research-intensive universities. Our research-intensive universities produce ground-breaking discoveries; develop top research and innovation leaders for all sectors of the economy; attract and retain leading global talent; and contribute expertise to a wide range of commercial and social endeavours. These contributions, enabled by fundamental research, are essential to developing sustainable, innovative approaches that address our most pressing issues, ranging from climate change to Indigenous relations to natural resource development and clean technologies.

Canada's ability to respond successfully to these issues requires a strong foundation of research excellence. At the federal level, the research granting councils (the Tri-Council), consisting of the Natural Sciences and Engineering Research Council (NSERC), the Social Sciences and Humanities Research Council (SSHRC) and the Canadian Institutes of Health Research (CIHR), along with the Canada Foundation for Innovation (CFI), provide essential foundations for Canadian research. Successive federal governments have recognized the valuable contributions of university research and have made a range of investments that have supported these foundations, resulting in Canada's position as a leading knowledge economy. To ensure that Canada remains globally competitive in research and innovation, we must build on these important investments, including the 2000 Canada Research Chairs program, the creation of the Canada First Research Excellence Fund (CFREF) and Budget 2015's $1.33-billion allocation to CFI.

The federal government can strengthen Canada's innovation ecosystem by investing strategically in these foundations. In Budget 2016, The U15 proposes that the Government of Canada:

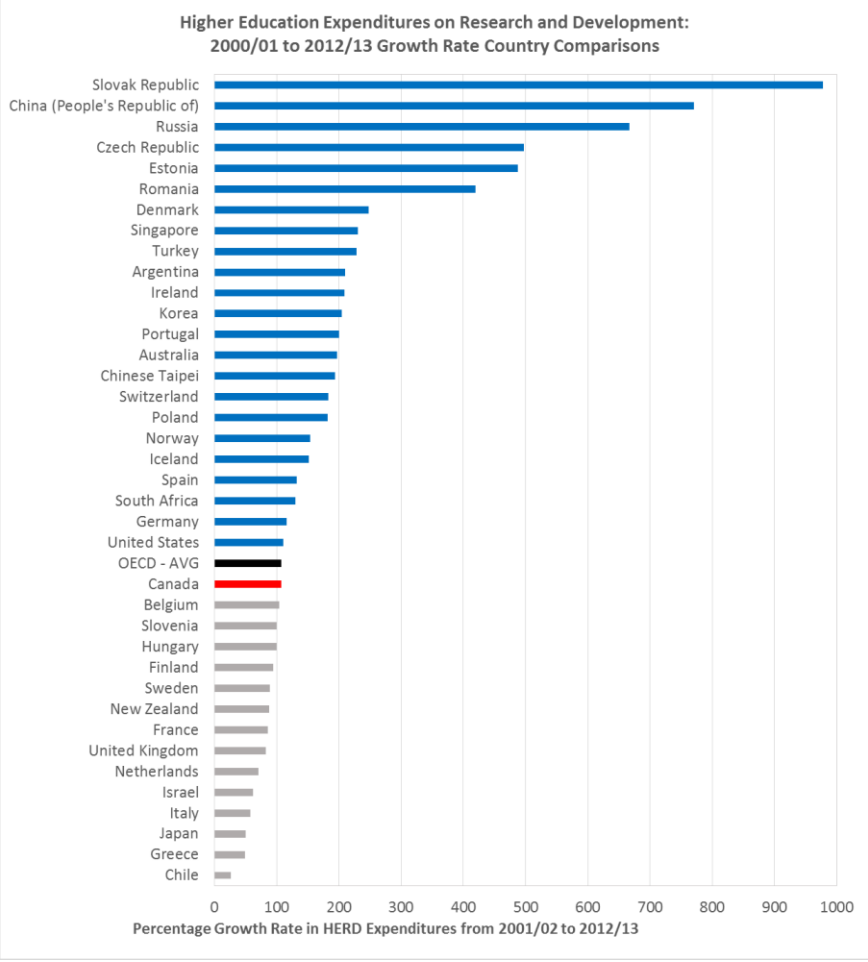
- Increase Tri-Council funding to inflation-adjusted 2007-08 levels over the next four years; and
- Launch an Innovative Campus Infrastructure Program (ICIP) to finance campus research infrastructure projects that fall outside the scope of CFI.

We provide further details on each of these proposals on the following pages.

Proposal 1: New, Unfettered Support for the Tri-Council

In our complex world, science and research have become indispensable to every facet of our economy and our society. By investing in university research, Canada's Tri-Council[1] plays a foundational role in Canada's innovation ecosystem, helping to ensure that our country continues to prosper economically and socially. Tri-Council programs such as the Canada Research Chairs, the Canada Excellence Research Chairs, the Canada First Research Excellence Fund and other supports help make Canada a world leader in cutting-edge research excellence and an incubator of world-class research talent. Discoveries resulting from these investments are transforming diverse endeavours, including advanced manufacturing, finance, agriculture, governance, and the creative arts. In addition to the domestic benefits of research excellence, scholarship and discovery are essential parts of our efforts to address global challenges, ranging from Indigenous relations to climate change to the implications of demographic shifts.

Strategic Tri-Council investments help to attract and retain world-class researchers, who in turn train creative, curious students to look to the future and to ask and answer big questions. These leading-edge researchers, along with facilities the Canada Foundation for Innovation and the Research Support Fund finance, have created a platform for innovation that is central to Canada's knowledge-based economy and society. Canada's businesses, governments and non-profit organizations rely on this platform to produce highly qualified personnel, to conduct more than $2.8B in contract research each year, and to push the frontiers of knowledge through discovery-driven research. However, this platform requires sustained investments if it

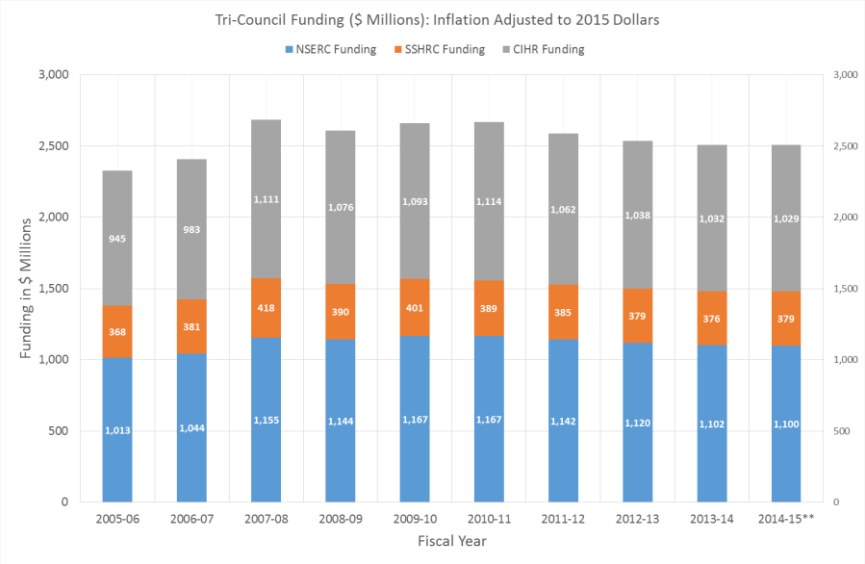


[1] The Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council and Social Sciences and Humanities Research Council

is to continue to deliver these benefits and compete with other nations for top talent. As other OECD countries increase their investments in innovation, Canada's ranking on higher education expenditure on R&D as a share of GDP has fallen. In 2013, Canada ranked eighth, down from its third-place ranking in 2006.[2]

Issue

Since 2007-08, inflation has, in real terms, eroded federal funding to the Tri-Council. Adjusted for inflation[3], the Tri-Council's 2014-2015 funding is about $176 million less than its 2007-2008 funding. Based on current allocations, in 2015-16 that gap is expected to increase to about $210 million.



Further exacerbating this erosion in funding is the fact that much of the federal funding to the Tri-Councils over the last decade has been targeted to specific programs or priorities. As a result, there are unmet needs at various stages of the research pipeline (e.g. international collaboration, funding for early-career researchers and interdisciplinary projects).

Although Tri-Council funding supports university-based research projects, there is limited federal support for maintaining the labs and equipment and paying the managers and administrators needed to complete those research projects. Most Tri-Council research grants do not cover these indirect costs of research. The Research Support Fund does provide some funding, but the program's current funding level and formula leaves institutions to cover significant costs associated with federal research grants. New investments in the Tri-Council must take steps to close this gap.

Recommendation

To ensure that Canada's research excellence platform continues to support our innovation ecosystem, The U15 Group of Canadian Research Universities recommends that the federal government:

- Commit to increasing Tri-Council and Research Support Fund funding to their inflation-adjusted 2007-2008 levels over four years:

[2] Science, Technology and Innovation Council, "Canada's Innovation Challenges and Opportunities" 2015.

[3] Because CPI was not available for fiscal 2015-16, inflation calculated based on October CPI for each year.

    - For example, restoring funding to inflation-adjusted 2007-08 levels in 2015-16 would require an increase of about $210 million for the Tri-Council[4] and $15 million for the RSF;
    - These new investments should be unfettered, to allow each agency to focus investments on programs or areas with particularly acute needs (e.g. early career researchers, international collaborations.);
    - These new investments should be annualized.
- In addition to inflationary adjustments, increase funding for the Research Support Fund by an amount equal to at least 25 percent of any new Tri-Council investments, to mitigate the indirect costs associated with the new grants; and
- Index Tri-Council and RSF funding to ensure that inflation does not erode the funding in the future.

Proposal 2: Innovative Campus Infrastructure Program

The research facilities at Canada's universities are a critical component of our innovation ecosystem. These facilities, and the talented people who learn and work in them, develop new products and services, new drugs and promising treatments, and new ways of understanding the world. They help create a prosperous economy, a thriving and creative society, and new solutions to global challenges. Ensuring that Canada has well-maintained, quality facilities is an essential part of building a high-performing research and innovation ecosystem.

Modern research and innovation facilities improve Canada's ability to attract and retain top domestic and international talent. Our researchers need a variety of facilities, ranging from state-of-the-art labs to collaborative spaces.

Example campus infrastructure needs

Increased energy efficiency:

- Adopting alternative energy systems (including solar panels, and geothermal heating systems)
- Improved laboratory ventilation
- Building to LEED standards on campus

Improved health and safety:

- Upgrading security and emergency systems (including alarm and intercom systems)
- Making buildings more accessible (e.g. installing ramps, elevators, accessible washrooms
- Enhancing hazardous materials disposal systems

Issue

At present, many of Canada's research- and innovation-related campus facilities and infrastructure require immediate renewal. As a 2014 study of campus facilities pointed out: "Major building components are known to reach the end of their useful life after 25 years, while high risk reliability issues become apparent after 50 years. Within the next five years,

[4] This amount is the difference between the inflation-adjusted 2007-2008 funding levels and the funding allocated to the Tri-Council in the 2015-2016's Main and Supplementary (A & B) Estimates. Supplementary Estimates C were not available at time of writing.

unless there is substantial reinvestment, more than 60% of the space studied will have reached 25 years without renewal, while the amount of space over 50 years will increase to over 25%."[5] Potential areas of investment include building new energy-efficient facilities, expanding successful facilities such as start-up incubators, and retrofitting existing facilities to improve energy efficiency and to upgrade health and safety components. These projects can generate significant long-term benefits. For example, investments made through the 2009 Knowledge Infrastructure Program are estimated to have saved more than $23 million per year in energy-related operating costs at universities and colleges.

Knowledge Infrastructure Program
$2 billion invested in 538 projects across Canada using the following principles:

- Flexible: wide range of eligible projects
- Timely: identified needs and proposals with clear two-year time frames
- Accountable: projects received funding according to a schedule based on meeting specific deadlines
- Third-party review: Accounting firms conducted site visits, audits and reviews

Auditor General lauded the program for its "speedy implementation," and its capacity to "stimulate the economy within a two-year time frame."

As the federal government finalizes plans for infrastructure investment, the higher education sector is a logical partner. Many institutions have already identified priority projects that could begin quickly, providing rapid stimulus to the Canadian economy. In addition to the jobs and broad economic stimulus that investing in infrastructure delivers, improving Canada's university research and innovation infrastructure reaps significant dividends by developing top talent, generating new ideas and mobilizing knowledge for Canada's benefit.

Recommendation

To help fuel Canada's research and innovation ecosystem, The U15 recommends that the federal government:

1. Launch the "Innovative Campus Infrastructure Program" (ICIP). The ICIP would:

    a. Emulate the proven Knowledge Infrastructure Program (see sidebar) which the Auditor General and Industry Canada's Departmental Evaluation Committee have lauded as timely and effective;

    b. Align with the government's science, technology and innovation agenda, through its management by the Department of Innovation, Science and Economic Development; and

    c. Invest in on-campus infrastructure that falls outside CFI's mandate.

[5] Canadian Association of University Business Officers. Deferred Maintenance at Canadian Universities: An Update, 2014

Conclusion

We appreciate the opportunity to advance these recommendations about ways to strengthen Canada's economic and social fabric. Our nation's ability to deliver economic growth, improve our relationship with Indigenous peoples, address climate change, produce clean energy, and foster innovation in Canada's natural resources industries requires a robust and vibrant innovation ecosystem. The proposed investments in direct research funding and infrastructure are essential to developing a robust research environment that capitalizes on the contributions of fundamental research. These investments are essential to developing, attracting and retaining the top talent, building the strong research clusters, and fostering the culture of innovation that Canada needs to prosper now and for generations to come.

We would welcome the opportunity to discuss in greater detail the ways in which research-intensive universities strengthen our innovation economy.