



**Group of Canadian Research Universities**

Regroupement des universités de recherche du Canada

**U15 PRE-BUDGET SUBMISSION  
IN ADVANCE OF THE  
2022 FEDERAL BUDGET**

**JULY 27, 2021**

## RECOMMENDATIONS:

### 1: Invest in People

The Government of Canada should invest in the people necessary to create a world-class research workforce:

- a. *Graduate students and postdoctoral fellows*  
Expand the pipeline of highly qualified researchers by tripling the number of Canada Graduate Scholarships for Master's-level degrees and doubling the number for PhDs and postdocs.
- b. *Early- and mid-career researchers and underrepresented groups*  
Support the full range of highly talented researchers through grants for early career researchers, mid-career researchers, and underrepresented groups. This can best be achieved by increasing granting agency funding by 10% per year for the next 5 years, and 5% per year for the subsequent 5 years.
- c. *Canada's exceptional researchers*  
Meet the global competition for top talent by expanding and reorienting the Canada Excellence Research Chairs program, with half of new chairs aimed at attracting new talent, and half at retaining current talent.
- d. *Attract the best and brightest*  
International students are one of our most important streams of skilled immigration, and over the last year, Canada has become increasingly attractive for young people around the world. The government should set a goal of making Canada *the* first-choice destination for international students by adopting immigration policies that ensure we remain competitive.

### 2: Invest strategically in Canada's research ecosystem

The Government of Canada should invest strategically through a science-based industrial policy in research that will help ensure Canada's ecosystem remains globally competitive:

- a. Set a benchmark of achieving 2.5% of GDP invested in research within 5 years and achieved it through increased and balanced investment in both Higher Education and Business R&D.
- b. Building on the national quantum and AI strategies, drive innovation in advanced technologies by making targeted investments in initiatives at the intersection of commercial opportunity and research excellence; where there is a confluence of high growth multi-billion-dollar markets, existing research strength and a strong potential for Canadian companies to capture a significant share of resulting high-value activity.
- c. Realize greater return on public investments by increasing support for the full cost of research, enabling universities to manage our national research enterprise, produce and help secure Canadian IP through university/industry partnerships, and undertake more comprehensive commercialization initiatives that bring research knowledge to market.

### **3: Rebuilding campuses for tomorrow**

The Government of Canada should invest in high-priority university infrastructure projects that will drive innovation and economic growth, lower emissions, protect Canada’s knowledge assets, and increase accessibility for all Canadians:

- a. The Government should invest in campus infrastructure based on the core concepts of green, inclusive, and digitally enabled. These investments will help us meet our climate goals, increase accessibility, and improve our digital infrastructure. The investments should include support for upgrades and retrofits to existing facilities, new networking and communications technologies that increase accessibility for a broader range of students, and advanced computing and data management capacities needed by today’s research community.
- b. Address increasing national security concerns by investing in university security administration, cyber security, data protection systems and communications networks.

## Introduction

The pandemic-driven global crisis has revealed many truths within our societies, exposing long-standing weaknesses, inequities, inefficiencies, and injustices. However, the crisis also showed us the collective power of government, the private sector and world-class research institutions to change people's lives for the better. Over the last 18 months researchers across all disciplines have pulled together, with amazing results. We have seen the most effective and fastest developed vaccines in history, in addition to hundreds of other therapeutic treatments. All of this has served to highlight the crucial role of the research community in improving quality of life and confronting the world's most significant challenges.

As we begin to emerge from the pandemic, Canada faces increasing competition for the talent needed to drive high-growth, knowledge-intensive industries, address global challenges and build an equitable, inclusive society. Canada has many advantages in this competition, including a welcoming society and open immigration system, vibrant cities, proximity to the United States, and strong world-class research universities.

Countries around the world, however, are making massive investments in research and talent development at a scale never seen before. Canada will need to invest strategically in research, innovation, and skills development to ensure we continue to be economically competitive, able to equip Canadians for the jobs of the future and remain a destination of choice for highly talented people from around the world.

## Recommendation #1: Invest in People

A crucial building block for a successful knowledge economy is highly qualified people with advanced university degrees because they are tomorrow's generators of new knowledge and the drivers of innovation in companies and social enterprises across the country. Canada, however, is not competitive, ranking 28<sup>th</sup> in the OECD for master's and PhD attainment.

A second crucial building block is Canada's research and technology development workforce; the tens of thousands of individuals who work every day to develop the knowledge we need to address the challenges of technological transformation, a rapidly changing climate, evolving societal values and geo-political upheaval. To effectively meet these challenges, Canada must support the full range of highly talented researchers, across all career stages and demographics, and especially those groups who remain underrepresented. As a recent Council of Canadian Academies report concluded, cultivating a robust, resilient, and diverse scientific workforce is central to the development of a nation's research capacity and requires supporting researchers throughout their careers.<sup>1</sup> Our ability to attract top professors and international students is particularly important. Almost half of international graduate students become permanent residents within 10 years of their first arrival – a real brain gain for our country.

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<sup>1</sup> Council of Canadian Academies, *Powering Discovery: The Expert Panel on International Practices for Funding Natural Sciences and Engineering Research*, 2021.

Finally, in today’s increasingly competitive R&D environment, attracting and retaining the very best researchers who strive to make fundamental breakthroughs in areas such as health technologies and alternative energy will be critical to our future. Investing in outstanding researchers and their high-performance teams will help Canada compete on the world stage and capture a larger share of the jobs and growth that comes from research, and technology development.

However, between 2014 and 2018 the number of full-time researchers per million inhabitants in Canada declined by 4.8%. During the same period, the number of researchers in the USA increased by 4.9%, the UK by 8.9%, and Germany by a full 20.6%.

## Recommendation # 2: Invest Strategically in Canada’s Research Ecosystem

Between 2014 and 2018, 32 countries increased spending on R&D, boosting global research spending (in PPP\$ billions, constant 2005 prices) by 19.2%, outpacing the growth of the global economy (+14.8%). This translated into a rise in research intensity from 1.73% to 1.79% of GDP.

The global race for scientific achievement is accelerating as governments increasingly see concrete linkages between research and both economic growth and national competitiveness. Most are striking a balancing between fundamental and applied research, while focusing on the attraction and retention of top research talent.

### United States

President Biden’s proposal to Congress calls for an investment of \$9 billion to NIH, \$1.7 billion to NSF, \$6.5 B to ARPA-Health and \$1 B to ARPA-Climate and ARPA-Energy.



### United Kingdom

launched R&D Roadmap, with commitment to increase public funding to £22 billion per year by 2024. Focus on attracting both international students and top research talent.

**European Union**  
€97 billion for Horizon Europe over the next seven years.



### Germany

Continued investment in High-Tech Strategy, with a goal of reaching 3.5% of GDP in R&D annually.

Figure 1 The Global Competition

Canada was not one of these countries. Measured in constant 2005 prices, between 2008 and 2018, Canada’s gross expenditures on R&D declined from \$23 billion to \$22.9 billion. Public investments barely kept up with inflation while industrial research intensity declined from 0.78% to 0.63% of GDP.

The reality is that Canada is falling behind. Our national R&D expenditures as a percentage of GDP has been declining since 2001 and by 2018, we were ranked 18<sup>th</sup> among the 34 OECD member countries and sixth out of the G7 countries. The USA currently invests 2.9% of GDP in research. Canada is at 1.57%, significantly less than the OECD average. The number of researchers in Canada has declined over the last six years, the only G7 country to experience a decrease. Reflecting this, Canada’s place on the Global Innovation Index slid from 8<sup>th</sup> in 2011 to 17<sup>th</sup> in 2019.

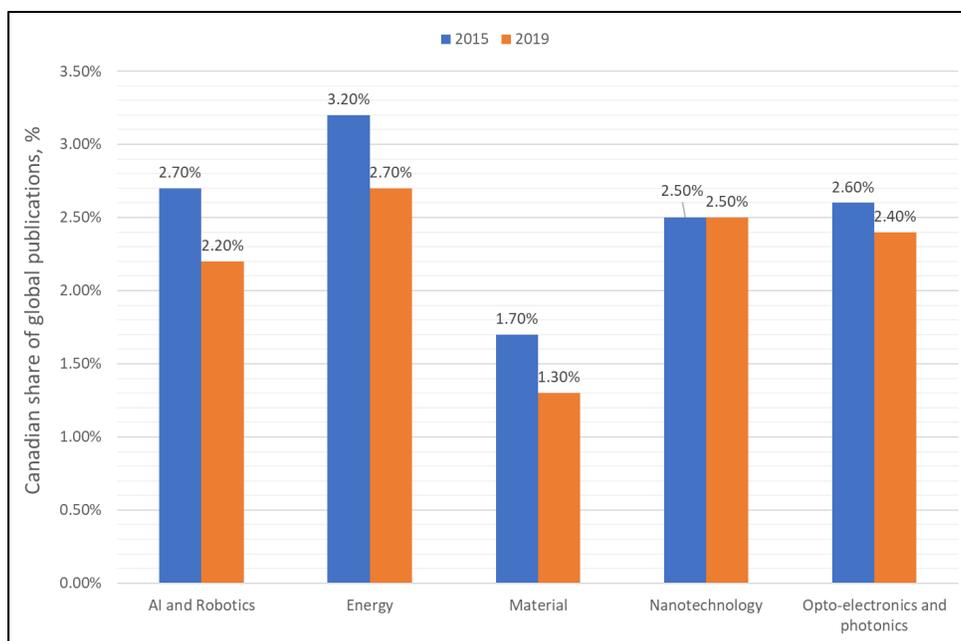


Figure 2 Canada's share of publications in strategic technologies (UNESCO Science Report 2021)

The Government recognizes these trends and acted by investing in bio-manufacturing, genomics, laboratory upgrades, quantum computing and artificial intelligence. These investments will strengthen university research and the private sector firms with whom they partner. Increasingly, these partnerships drive successful Canadian R&D intensive industries, turning some of our cities and regions into globally competitive innovation hubs. We encourage the Government to adopt a science-based industrial strategy that builds on research strengths and fosters university/industry partnerships and collaborations.

Canada's sustained prosperity and economic growth rely on our capacity to transform discoveries into commercial successes. Although our laboratories conduct excellent cutting-edge research and are important actors in the innovation chain, successfully bringing innovations to market is a complex process requiring active support, effective management and strong collaboration between the private sector, universities, and governments.

Universities are best placed to scout promising innovations on their own campuses, and provide researchers with connections to accelerators and incubators, industrial partners, entrepreneurs, and potential investors. Even though Canadian universities are committed to creating greater innovation capacity through collaboration and knowledge mobilization, the reality is that they have very limited resources to do so.

In addition to individual research grants, a world-class research environment requires support for the institutional activities necessary to manage, safeguard, and mobilize research knowledge.

For universities, these activities, among many others, *are* the full costs of research.

Universities appreciate the support provided through the Research Support Fund (RSF), but because of the funding formula, research-intensive universities are particularly affected by the persistent RSF funding gap. The average funding rate for all U15 institutions is 20.5%, with a low of 20.0%. The equivalent funding rate for the public universities of the Association of American Universities is 52.8%.

This funding gap seriously compromises the quality of research and learning environments and hinders our ability to attract world-class researchers and students, retain future leaders, invest in research commercialization and partner with industry.

### Recommendation #3: Rebuilding Campuses for Tomorrow

The U15 encourages the Government of Canada to help rebuild Canada's universities by adopting a long-term vision for infrastructure that centres on three core concepts: green, inclusive, and digitally enabled.

In the university space, the goal is to build a national network of institutions that enable social and economic transformation while providing the next generation of Canadians with inspiration, opportunity and deep understanding of the forces shaping our world.

Canadian universities, across the country, are engaged in efforts to green their campuses. Greater investment, however, is necessary to accelerate the modernization of aging buildings, the retrofitting of existing infrastructure, the reduction of energy consumption, and contribute more significantly to Canada's green recovery objectives.

University infrastructure with a focus on accessibility can also affirm the Government's commitment to inclusion. As learners of all ages displaced by the pandemic look to universities for training opportunities, action is needed to make campuses accessible with modernized infrastructure. In the digital space, a high-quality online experience must be adapted to enable those with learning disabilities. The goal is to ensure that our physical campuses are not an obstacle for those Canadians who want a high-quality university education.

To support reconciliation with Indigenous peoples in Canada, universities are building new forms of research facilities and learning spaces. These are specifically designed to meet unique needs for the inclusion of new and existing Indigenous knowledge, engagement with local communities, languages and cultures, and the creation of economic opportunities that respect and reinforce Indigenous commitments to land and the environment. But much more needs to be done to provide Indigenous people in Canada with the research and knowledge resources they need to flourish.

## Conclusion

As we emerge from the pandemic countries around the world are responding to today's challenges with massive investments in science, technology, and knowledge mobilization. They are convinced that highly educated citizens, equipped to innovate better and faster, is the key to success. As a result, Canada is facing dramatically increased competition for talent, for scientific leadership and ultimately for the social, economic, and environmental benefits that stem from research and technology development.

The U15 encourages the Government of Canada to consider these recommendations to meet the challenges of increasing global competition, and ensure we build a Canada with the right capabilities and people with the right skills to secure our future.