

House of Commons Standing Committee on Finance
Brief from the Canada Foundation for Innovation

About the Canada Foundation for Innovation

The Canada Foundation for Innovation (CFI) is the Government of Canada's principal agency for funding research infrastructure in universities, colleges, and research hospitals, across all disciplines, across the spectrum of research, from fundamental discovery to applied technology development, and across the country.

Our time to shine

This is Canada's time to shine on the world stage: to educate, retain and attract the best minds in the world; to provide them the space and facilities for innovation and creativity; to offer them the resources necessary to place Canada as a strong leader in science, technology and social science research.

We must now focus our attention and our resources on building the communities that will make our way of life sustainable. They must be healthy, environmentally-friendly, technologically savvy, safe and secure, culturally rich, and lit by our best minds.

When we invest in our youth and in bright ideas, we invest in our future.

Two reports released by the Government of Canada this spring provide critical context and direction on federal measures that would do just this, by helping Canadians and Canadian businesses be more productive. The *Path to Prosperity* report by the Government of Canada's Advisory Council on Economic Growth focused on delineating strategies to accelerate economic growth in Canada, while the *Investing in Canada's Future* report by the Advisory Panel on the Federal Support for Fundamental Science looked at how to strengthen the foundations of this country's research and technology development ecosystem. Both reports share one common idea: that Canadians — particularly younger Canadians — need to gain modern skills and knowledge to be productive in their workplaces and in their communities.

The research ecosystem at Canada's post-secondary institutions is well positioned not only to provide a rich training ground for young people, but also to spark big ideas and innovations, and to ensure a strong research support system for Canadian businesses, helping them to be more productive and competitive.

Government of Canada investments through the federal funding agencies — the Natural Sciences and Engineering Research Council (NSERC), the Social Sciences and Humanities Research Council (SSHRC) and the Canadian Institutes of Health Research (CIHR) — and the Canada Foundation for Innovation (CFI) are critical to maintaining a healthy research ecosystem in our universities, colleges and research institutes. They support researchers and give them the tools they need to push the frontiers of knowledge and support innovation.

For these reasons, the CFI fully supports the recommendations of the Fundamental Science Review Panel, particularly those designed to increase funding to the federal granting agencies, and to regularize

support for research infrastructure funding through the CFI. As stated in the panel’s report: “Given global competition, the current conditions of the [research] ecosystem, the role of research in underpinning innovation and educating innovators, and the need for research to inform evidence-based policy-making, [these investments] are among the highest yield investments in Canada’s future that any government could make.”ⁱ

Setting an ambitious roadmap for Canada

The Fundamental Science Review Panel report sets out an ambitious roadmap for Canada’s post-secondary research community. It comes at a time when our country has a tremendous opportunity to capitalize on its values and global standing to attract and retain the kind of bright young scholars who will help build Canada’s future.

The report highlights the strengths of Canada’s research system and points to areas where federal support for post-secondary research can be strengthened. Its recommendations focus on increasing federal investments in research, and improving support for early-career researchers, international collaborations, major research facilities, and equity and diversity in research. The report also recognizes the CFI as a key pillar in Canada’s research system, along with the three federal granting agencies.

How state-of-the-art infrastructure supports research, innovation and productivity

Over the last 20 years, the Government of Canada, through the CFI, has funded the labs and facilities that have become engines of opportunity for Canada’s post-secondary research community. These contributions have laid the foundation for supporting research excellence across all disciplines and across the country by putting state-of-the-art tools in the hands of those with the most potential to make breakthrough discoveries and fuel Canadian innovation. These facilities act as magnets for international collaborations and for the recruitment of the best students, post-doctoral fellows and researchers from around the world.

CFI investments have helped modernize campuses, allowing researchers to explore and find innovative solutions to local and global problems. Cumulative infrastructure investments over the years have contributed to Canada’s becoming a global leader in areas such as regenerative medicine, agri-food and energy, and have allowed us to look ahead with confidence in our ability to diversify our economy through emerging areas identified by the Economic Advisory Council as having tremendous growth potential for Canada, such as quantum computing and clean technology. For example, since its inception, the CFI has invested approximately \$150 million infrastructure related to clean technology researchⁱⁱ, including the Clean Energy Research Centre at the University of British Columbia which actively seeks industrial partnerships to develop safe, widespread and equitable sustainable energy alternatives. The CFI has also awarded more than \$200 million for quantum-related infrastructureⁱⁱⁱ, including approximately \$21 million at the Institute for Quantum Computing and associated facilities at the University of Waterloo, where research is paving the way for the future of computing and communications technology.

Training a new generation

Each year, about 2 million students are enrolled in universities and colleges in Canada. According to a recent survey^{iv} conducted by the Canadian Alliance of Student Associations, the top barrier to finding a job for young Canadians is a lack of relevant experience. State-of-the-art research facilities funded by the CFI contribute to ensuring Canadians are trained using not only the latest technologies, but that they also develop the skills required to meet the needs of employers. These are the capabilities needed to drive increased productivity, business competitiveness and economic growth. The CFI plays an important role here. On average, approximately 30,000 undergraduate, graduate and post-doctoral fellows access CFI-funded infrastructure every year where they gain the hands-on, advanced technical skills they need to enter the workforce.^v They benefit from being mentored by top minds who transfer their insight and critical thinking skills, giving them a leg up in their careers.

Because of today's rapid pace of technological change, the tools and equipment used to train the next generation must be kept up to date so these students and young researchers have the most current skillset to compete in and adapt to a quickly evolving job market. For instance, in addition to offering exposure to more robust data and modern software, working on complex CFI-funded infrastructure allows students to develop advanced skills in project management, people management, project implementation and technology development.

Moreover, research talent is more mobile and in higher demand than ever. Not only do we need excellent facilities to attract international talent but we must also provide the best training environment for the new generation of research leaders. The Review of Federal Support for Fundamental Science suggests that “the development and retention of outstanding students, trainees and young researchers must be at the top of any priority list for the national research enterprise.”^{vi} For universities, colleges and research hospitals, having suites of cutting-edge labs and equipment allows them to attract and retain not only students, but also top researchers from around the globe. Within these labs, researchers foster productive collaborations among academic, private and public organizations. The result? Research that contributes to healthier individuals, a more resilient and productive workforce, stronger communities, a sustainable environment and globally competitive businesses.

Our recommendations

Ensuring Canadians have the knowledge, skills, creativity and entrepreneurial ambitions they need to stay ahead of the curve and compete in today's global economy requires sustained investment in research, the creation of new knowledge and the development of new technologies that drive innovation and increase productivity.

As one member of the Advisory Panel said, “The future of Canada is in its grey matter.” Providing students and researchers with access to cutting-edge infrastructure will give them the opportunity to push the boundaries of knowledge and technology development to enhance Canadian growth and prosperity. This surely is Canada's best hope for the future. In Budget 2018, the Canada Foundation for Innovation urges the Government of Canada to endorse the recommendations set out in the report by the Advisory Panel for the Review of Federal Funding for Fundamental Science:

1. **Increase funding to the federal funding agencies.** Research infrastructure is about people — it requires bright minds to generate ideas and push the boundaries of science. As argued by the

Advisory Panel, increased funding to the granting agencies would improve the health of the research ecosystem, allowing new researchers to establish themselves and more seasoned researchers to continue their valuable work. It would also support international collaborations, more multidisciplinary projects and potentially ground-breaking research. Federal granting agencies also play a vital role in supporting the next generation of researchers. It is important to emphasize that approximately 70 percent of grants awarded by NSERC, SSHRC and CIHR directly support students and post-doctoral fellows, ultimately allowing them to seize learning opportunities and gain valuable skills that will help make them productive members of the workforce.

2. **Regularize support for research infrastructure.** As the Advisory Panel correctly pointed out in their report, the impact of the CFI on the ability of Canadians to be creative, productive and adaptable is limited by the periodic and inconsistent way the CFI currently receives financing from the Government of Canada. This situation leaves universities and colleges unable to effectively identify and plan their research infrastructure needs, creates uncertainty for researchers and their students, and leaves provincial co-funders unable to plan their investments in CFI-funded projects.

Other countries are investing in their research capacity so investing in the ability of universities to retain top talent and emerging researchers, particularly in areas of high potential for Canada, such as advanced manufacturing, agri-food, clean resources and technology, digital technology, and biosciences, has never been more important.

In addition, engaging Canada in international collaborations requires state-of-the-art research infrastructure. Stable funding for research infrastructure enhances the ability of university researchers to plan their research infrastructure needs and build collaborations and engage globally in search of solutions to complex issues facing nations around the world.

The Advisory Panel recommends that the CFI be provided with an annual budget of \$535 million, which includes \$300 million for capital expenditures and \$235 million for operations and maintenance of the research facilities. As the Advisory Panel mentions, this investment is equivalent to the average annual disbursements made by the CFI in recent years, and is largely fiscally neutral.^{vii}

Ultimately, federal measures aimed at making Canadians and Canadian businesses more productive and competitive come down to making sure Canadians have the resources they need to make positive and meaningful contributions to society. As one PhD student at Simon Fraser University recently told us, with access to cutting-edge research infrastructure, “you have a little bit of time to create better world.”

ⁱ *Investing in Canada's Future: Executive Summary*, Advisory Panel on the Federal Support for Fundamental Science, 2017, page 14.

ⁱⁱ Based on key word search, CFI data as of Dec 2015. Because of CFI's leveraging formula (40:60), overall, these investments supported more than \$375 million in projects related to clean tech.

ⁱⁱⁱ Based on key word search, CFI data as of March 2017. Because of CFI's leveraging formula (40:60), overall, these investments supported more than \$500 million in projects in quantum-related infrastructure, including more than \$50 million at the Institute for Quantum Computing and associated facilities at University of Waterloo.

^{iv} *The Next Canada – Politics, political engagement, and priorities of Canada's next electoral powerhouse: young Canadians*, Canadian Alliance of Student Organizations, 2016.

^v Data from CFI Project progress report 2012-16

^{vi} *Investing in Canada's Future: Strengthening the Foundations of Canadian Research*, Advisory Panel on the Federal Support for Fundamental Science, 2017, p. 12

^{vii} *Ibid.*, p. 152.