

CANADA FOUNDATION FOR INNOVATION

For a more prosperous
and sustainable Canada:
Consultations for our
2023–28 strategic plan

INNOVATION

Canada Foundation
for Innovation

Fondation canadienne
pour l'innovation



Our mandate and role

The Canada Foundation for Innovation (CFI) was established to benefit Canadians by strengthening the capability and capacity of Canadian universities, colleges, research hospitals and non-profit research institutions to carry out world-class research and develop cutting-edge technologies that are needed to push back the frontiers of knowledge in all disciplines.

It delivers funding on behalf of the Government of Canada to enable Canada's research organizations to modernize, acquire, develop, operate or maintain research infrastructures in Canada or to purchase access to research infrastructures located outside Canada.

An independent foundation, the CFI is funded through contribution agreements that include the objectives and expectations of the Government of Canada for the CFI.

Themes from our previous 2018–23 Strategic roadmap

- Support the full range of research infrastructures required by Canada's research institutions to achieve excellence with a focus on the convergence of disciplines
- Spark innovation by strengthening linkages and encouraging collaboration among research institutions, the private sector and not-for-profit organizations
- Support international partnerships and participation in global research initiatives to find solutions to Canada's and the world's most pressing challenges
- Strengthen Canada's global competitive advantage by supporting the institutions that are home to an equitable, diverse and inclusive research population.

Purpose of our 2023–28 strategic plan

The new strategic plan comes at a unique juncture for the CFI. Having marked 25 years of successful investments in research excellence, the new strategic plan provides a unique opportunity for the CFI and our stakeholders to build on this important foundation while looking to the future. It should therefore balance continuity of mission and activities with a willingness to explore and embrace new opportunities to contribute to Canadian research.

Themes for discussions for our 2023–28 strategic plan

The Science of Tomorrow

The CFI builds the foundations on which ideas can be developed into serious research projects that contribute to new discoveries, understanding and knowledge. It is essential that we look into the future to ensure that research in new concepts and fields is enabled. Under the theme of *The Science of Tomorrow*, the CFI is seeking insights about future-oriented and emerging science, technology and innovation. This theme considers both promising areas for research and science and novel areas where timely investments in fundamental research can enable Canada to remain, or become, a world leader. Understanding where research can lead Canada and the world in the coming years is critical for the CFI to be able to respond to new and developing priorities of Canadian science.

The CFI's funding has been critical to the development of once novel technologies that are increasingly commonplace, such as quantum computing and artificial intelligence.

- ▶ From 2011–12 to 2020–21, the CFI awarded over \$180 million in 134 infrastructure projects related to quantum computing.
- ▶ 85 percent of the amount the CFI invested in quantum computing research was awarded through the Innovation Fund.
- ▶ In the last Innovation Fund competition (2020–21), the amount awarded to projects related to quantum computing represented 17 percent of the total (compared to an average of 9 percent for the previous two Innovation Fund competitions).
- ▶ From 2012–13 to 2021–22, the CFI awarded over \$258 million in 375 infrastructure projects related to artificial intelligence. This represents 9.2 percent of total CFI investment during this period.
- ▶ The proportion of the amount awarded to the projects in artificial intelligence has steadily increased over the past 10 years, both overall and by fund. For example, the overall proportion of the dollar amount invested toward artificial intelligence increased over the past three years, reaching 11.5 percent in 2021–22. The same trend was observed for investments made through the John R. Evans Leaders Fund, for which 14.3 percent of the dollar amount in 2021–22 was for projects in artificial intelligence.

- What are the areas of science and research that you foresee emerging in the near- to medium-term (five to fifteen years)? And why? Are these fields new in Canada or are they currently developing? What would be their limitations or possibilities, their promise for Canada and for the research ecosystem as a whole?
- Are you currently working in, or planning to develop and invest in these areas of science and research in the near to medium term? If so, how best can your work be supported? Is your work linked to that of others across the country or around the world? Is there a network or acknowledged centre for researchers in this area?
- Is inter-/cross-sectoral research (convergence) more or equally significant to very focussed work in inspiring and addressing these emerging areas of science?
- Do you envisage partnerships as necessary to develop these emerging areas of science and research? Which type of partnership should be prioritized in research funding (e.g., domestic, international; private-sector, not-for-profit, public-sector)?
- Should participation in large international projects be privileged over domestic projects?
- Should the CFI evaluate differently projects in emerging, high-risk areas of science?

Future Prosperity and Healthy Communities

As Canada's leading funder of research infrastructure, the CFI contributes to science and research and Canadian wellbeing by contributing to economic growth and job creation, health and environmental quality. Under the theme of *Future Prosperity and Healthy Communities*, the CFI is seeking insights into the current social and economic challenges that confront Canada and the globe and how science and research contribute to local, regional and national wellbeing and prosperity.

This theme invites commentary on how the benefits of science and research can help reduce social and economic disparity arising from demographic change, the displacement of the centres of economic and social influence and the often-negative impacts on health and mental health of social, environmental and health crises as well as the increasing ubiquity of technology.

The theme concentrates on finding ways to target, develop, support and sustain promising multisector partnerships in research at the local level and non-academic research sites and institutions.

Understanding how research contributes to communities is critical for the CFI to be able to respond to the changing context of science and research.

- ▶ 162 researchers leading CFI-funded projects reported at least one of the six types of research outcomes (i.e., patents, licensing agreement, spin-offs, copyrights, industrial designs).
- ▶ 26 percent of researchers leading CFI-funded projects reported one or more jobs created due to CFI-funded infrastructure.
- ▶ 81 percent of the 827 jobs created outside the institution were in the private sector.
- ▶ The private sector was the most frequently reported user group benefiting from the research, followed by public and semi-public organizations and institutions.

- Should research infrastructure support be directed to responding to the challenges of the global community?
- How can science and research funding contribute to social and economic wellbeing locally, regionally and across Canada? Should the CFI assess social and economic impacts as part of its evaluation of a project's benefit to Canada?
- Should the CFI assess the potential for the commercialization of research outcomes as part of the evaluation of projects, when applicable and relevant?
- Should the CFI encourage partnerships between research facilities and small and large businesses? What can be done, in addition to the CFI's Research Facilities Navigator, to bring small businesses to institutional labs, and how can researchers be more readily welcomed in larger industries?
- In the context of limited funding, how can the CFI best support established research programs in world-class institutions, while supporting the development of new ideas and research organizations? How can/do/should universities, colleges and research organizations collaborate?
- How can the CFI enable and enhance the contribution of research facilities and investments to social and economic wellbeing in your community?
- Should the CFI evaluate projects for their community impacts differently from projects without evident or specific community impacts?

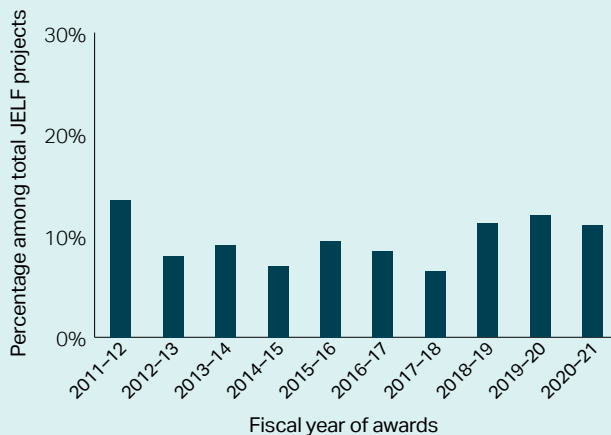
A Sustainable Future

The theme of *A Sustainable Future* links research to one of the biggest challenges facing Canada and the world today: climate change. Sustainability speaks to research with a concern for the natural environment and its capacity to meet current and future social and economic needs. It emphasizes the need to balance present development with the responsibility to regenerate, maintain and improve planetary resources for use by future generations. It includes thinking about doing research and development in a sustainable manner and being conscious of limiting the consumption of energy and working to make every project as sustainable as possible.

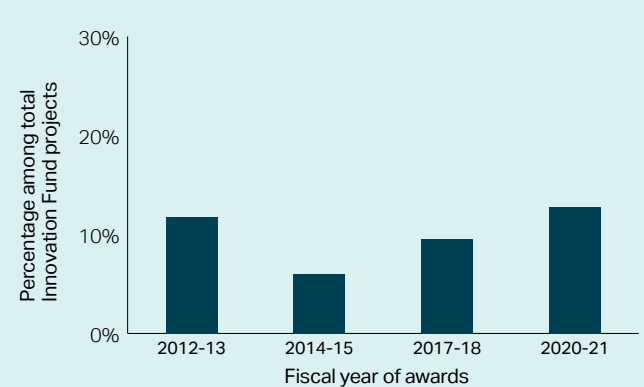
When we speak of sustainability, we reference the buildings and equipment the CFI funds, their best use, the ways we work, and the research undertaken. We acknowledge the climate crisis and our responsibility to reflect, react and play a leadership role in shaping and influencing the environmental impacts of the projects funded.

- ▶ The CFI has invested in projects focused on climate change, clean energy research and other areas related to the environment. These investments are anticipated to increase in the near and medium term.
- ▶ The CFI awarded \$219 million to 527 projects in the area of climate change and clean technology investment, under all funds (excluding the Major Science Initiatives Fund), from 2011–12 to 2020–21. This represents approximately 10 percent of the CFI's total financial awards in support of research infrastructure in that ten-year period.
- ▶ Facilities funded through the Major Science Initiatives Fund, which invests in maintenance and operation, also constitute an important area of investment, with some \$393 million having been awarded in the last ten years to initiatives that are supporting climate change and clean technology research.

Percentage amount awarded to John R. Evans Leaders Fund projects associated with climate change and clean energy by fiscal year



Percentage amount awarded to Innovation Fund projects associated with climate change and clean energy by fiscal year



- Should science and research in Canada prioritize current and future global challenges? Which ones, and how might this be addressed in competitions? Should a statement on how this project might contribute to sustainability through its goals or methodology be requested with each application?
- How can interinstitutional collaborations be leveraged to achieve more sustainable research? Can shared facilities contribute to sustainable research? How would this impact success in your research?

- Does your institution have an environment and/or sustainability plan? Does this strategy encompass research activities? Should the CFI request inclusion of a plan?
- Should research into sustainability be enabled through a thematic competition?
- Should the CFI evaluate projects for their impacts on the environment and sustainability? Should projects receive an additional contribution to enable investments in research equipment that would itself be more sustainable or energy efficient?
- Should a percentage of the Innovation Fund be set-aside to finance renewal and refurbishments of existing facilities, extending their life?

The Next Generation

The CFI's investments in science and research generate not only knowledge and discovery, but they also contribute to expanding research and job opportunities for the next generation of Canadian researchers, technicians and entrepreneurs. The theme of *The Next Generation* invites insights about how investments in science and research can support the development, recruitment and retention of promising domestic and international research talent at a time of institutional and demographic changes occurring in Canadian science and research. This theme also encompasses how best to support the development of future scientific and research talent among Indigenous people and other underrepresented groups.

This theme is also about ensuring how best to support and build this capacity across all regions and, in particular, organizations that have not benefited from CFI support previously.

Understanding how to develop and sustain researchers across their whole career is important for the CFI if it is to adapt its programs to be more effective in supporting institutional and individual realities. This theme embraces the principles of equity, diversity and inclusion and emphasizes how we can make all researchers from every background feel welcome and supported throughout their entire career.

- ▶ 93 percent of researchers leading CFI-funded projects indicated that CFI-funded infrastructure was important in their decision to remain at their institution. This was true across all fields of research.
- ▶ 93 percent of researchers leading CFI-funded projects reported that CFI-funded infrastructure was a key resource for the next generation of researchers.
- ▶ 28,269 postdoctoral fellows and higher education students had the opportunity to expand their research skills using CFI-funded infrastructure. Of those, 45 percent used the infrastructure for the first time in 2021.
- ▶ A total of 2,238 postdoctoral fellows and graduate students using the infrastructure completed their training and moved into the workforce. Among them, 79 percent (1,770) secured employment in Canada, the majority (67 percent) of whom joined the private sector.

- CFI funds are used to attract and retain outstanding researchers. Do you have any suggestions for ways the funding might be adapted to be even more effective and supportive toward that goal?
- What can be done to ensure that research facilities and spaces are more inclusive?
- What can be done to ensure that research facilities and spaces foster the development of research talent among Indigenous people and other underrepresented groups?
- How can research facilities further contribute to developing skills and competencies that are in demand in the labour market?

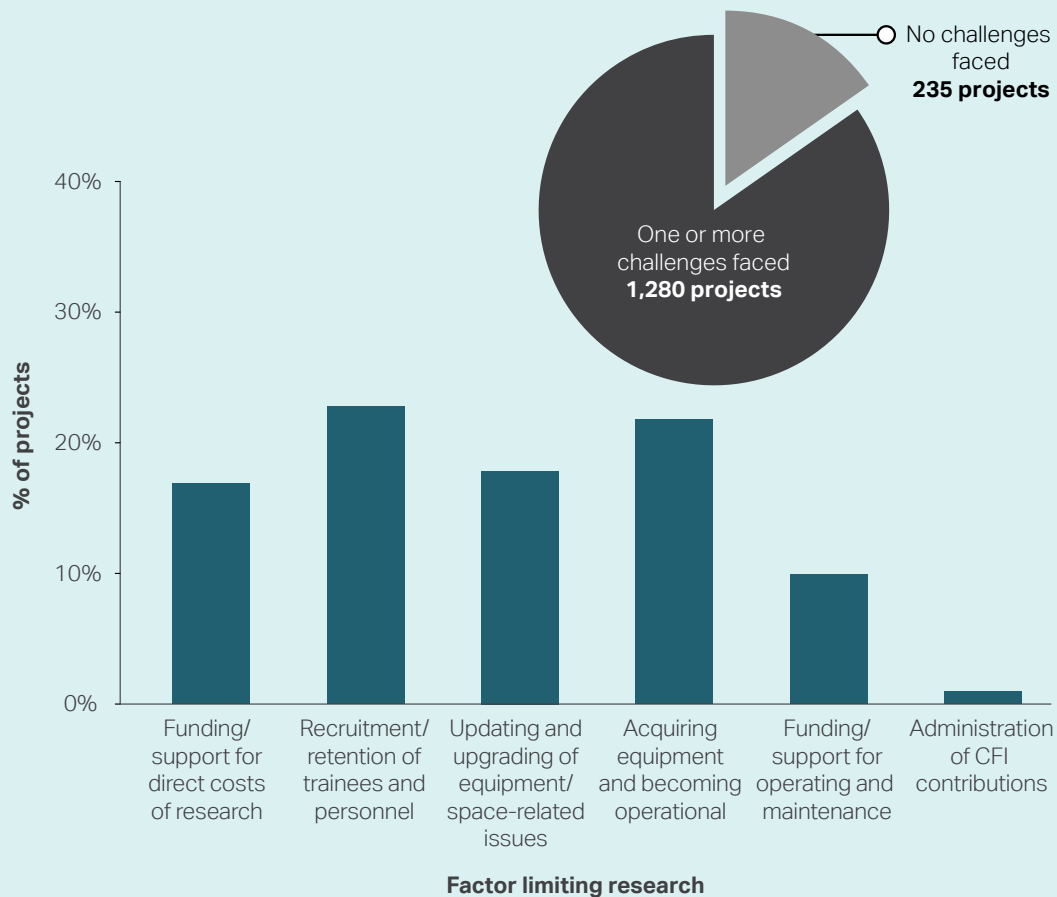
- How can the CFI's programs better contribute to developing, recruiting and retaining high-potential talent and highly qualified personnel?
- Should the CFI evaluate projects for their potential to develop skills and competencies that will support economic development, help train the next generation of researchers, and provide the talent necessary for industry?

Delivering for the Community

For 25 years, the CFI has enabled Canada's research ecosystem to rise to global leadership by delivering research support on behalf of the federal government to modernize, acquire, develop, operate or maintain research infrastructures in Canada or to benefit from access to research infrastructures worldwide.

The theme of *Delivering for the Community* seeks insights into how the CFI can better structure its activities to meet the needs of the research community that it supports at a time of change in how institutions and their funders operate.

- Two-thirds of project leaders reported one or more factors limiting the quality and impact of the research enabled by the infrastructure.



- When new programs are created for funding by the tri-agency, should the federal government automatically make a 15 percent grant to the CFI which could enable the acquisition of equipment and facilities to support research in the targeted or prioritized areas?
- The CFI is currently working with partners including MITACs, Genome Canada and Labs Canada. Should the CFI seek to develop more extensive funding partnerships with other organizations to provide integrated support to science and research? If so, please offer some suggestions and examples.
- Do you have any other suggestions for us?