Building the Future for Canadians

Budget 1997

Canada Foundation for Innovation

February 18, 1997

Department of Finance Canada
Ministère des Finances Canada

Available from the Finance Canada Distribution Centre
300 Laurier Avenue West, Ottawa K1A 0G5
Tel: (613) 995-2855
Fax: (613) 996-0518

and from participating bookstores.

Electronic versions also available from the same locations.
Also on the Internet at: http://www.fin.gc.ca/

Cette publication est également disponible en français.

Cat No.: F1-23/1997-7E
ISBN 0-662-25445-7

Canada Foundation for Innovation

"Technology and globalization are transforming economic activity. Governments cannot change this. Nations cannot hide from it. What we can do and are doing is work to ensure that Canada and Canadians are winners in this new global economy. An economy which above all focuses on knowledge and our knowledge capacity. That means helping our universities modernize and enhance their science capacity. It means helping our teaching hospitals improve their research capacity. It means increasing our investments in new technologies, research and development."

Prime Minister Jean Chrétien
February 13, 1997

Canadians know that, as they move into the next century, their economic well-being and quality of life will increasingly depend on innovation – on the generation of new knowledge and the ability to use it productively.

The federal government in the 1997 budget is taking an important new step to give Canadians the tools they need to be at the forefront of research and technology development.

The government is proposing to create the Canada Foundation for Innovation. Its purpose will be to provide financial support for the modernization of research infrastructure at Canadian post-secondary educational institutions and research hospitals in the areas of health, environment, science and engineering.

The Foundation represents an entirely new approach by the government to supporting innovation and research. It will be an independent corporation, at arm's length from government, and its members will be drawn from the research community and the private sector. They, not the government, will be responsible for spending decisions. The Foundation will not support projects of government departments, agencies or Crown corporations.

It will be funded through an up-front investment by the federal government of $800 million, which will allow it to provide about $180 million, on average, annually over five years.

The success of the Foundation depends on the willingness of Canadians to take on the challenge of enhancing our research capacity through new partnerships – among post-secondary educational institutions, research hospitals, the business community, the voluntary sector, individuals and, to the extent they wish to participate, provincial governments. Through partnerships, the Foundation has the potential to trigger up to $2 billion in investments in research infrastructure.

This initiative will help enhance the capacity of Canadians to carry out leading edge research and participate in the knowledge economy. It will create opportunities for researchers to carry out their work in Canada. It will help to prepare young Canadians to take their place in the increasingly technology-oriented workforce. And it will encourage the kind of collaboration and partnerships among research institutions and the private sector which are critical to making Canada competitive internationally.

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Research Infrastructure Challenge

"The Canada Foundation for Innovation is about looking forward. It is about our children. It is about education. In short, it is about investing in the future growth of our economy, making a down payment today for much greater reward tomorrow."

Paul Martin
budget speech
February 18, 1997

Investing in People

The wellspring of successful innovation is the knowledge and skills of scientists and researchers involved in the creation of new ideas, and the individuals who put them to practical use. In the emerging "knowledge-based" society, competitive advantage will increasingly come from skilled people with the knowledge and capacity to innovate.

Canada's post-secondary educational institutions and research hospitals play a key role in the innovation process. As both discoverers of knowledge and transmitters of that knowledge through teaching and research apprenticeship, they are an integral part of the "root system" that feeds the country's knowledge base. This root system needs to be nourished.

Creating opportunities for Canadian researchers and students

The ability to attract and retain highly qualified scientists and researchers depends increasingly on the capacity of our post-secondary institutions and research hospitals to provide adequate equipment and research facilities. Leading edge science and research requires a leading edge research environment.

There is a growing concern among Canadian educational and research institutions that we are losing many of our best scientists and researchers to other countries, particularly the United States, because of a lack of adequate opportunities to carry out research in Canada. Investing in research infrastructure – that is, the installations and equipment needed to carry out research – will create the opportunity for Canadians, especially young Canadians, to pursue their careers in Canada.

> "University researchers across Canada today are finding new ways to make concrete so that our bridges are not eaten away by road salt. They are making our health care system more efficient and more caring. They are developing new light metals to improve automobiles, and they are generating new industries – like aquaculture – to replace lost jobs and revive struggling communities.
>
> That's research. The cornerstone of innovation, the building block of a competitive economy, the Foundation of thousands of jobs for Canadians."
>
> *– Statement of 28 Canadian senior executives, in co-operation with the Association of Universities and Colleges of Canada, January 16, 1997*

Developing a technologically oriented workforce

The concern is not, however, limited to losing researchers to other countries. The quality of tomorrow's workforce will depend critically on the ability of our post-secondary educational institutions to graduate young people who understand the new technologies and can use them effectively. The demands of a technology-driven marketplace require not only engineers, scientists and technicians, but also managers who are technologically knowledgeable.

Firms, whether in the health care industry, the "high tech" sector or the traditional manufacturing industries, recognize that competitive advantage is based on their ability to innovate and apply the latest "know-how" to products, processes and services. They want research-oriented analytical problem-solvers who are a source of new ideas, understand the innovation process and are at ease in the world of new technology. If they cannot find them in Canada, they will tend to take their investments elsewhere.

At the same time, firms that aim for future economic success need to be prepared to make long-run investments in skills, education and knowledge – and to provide employment opportunities for young Canadians. The public and private sector share an interest in ensuring that our post-secondary educational system generates the highly skilled workforce the future will require.

Investing in Public-Private Sector Partnerships

Competition among countries is increasingly competition among their education and knowledge-generation systems. Education and research, like business, are also becoming more and more competitive. This has led to a greater focus on the development of integrated systems of research and research infrastructure.

Creating hubs

Just as companies are now "footloose", placing their investments in countries with favourable investment climates, so too scientists are increasingly gravitating toward locations that have invested in modern, integrated systems of research and research infrastructure – the environments in which modern research can be done. Successful innovation therefore tends to be concentrated where a critical mass of research and research infrastructure can be brought together in "hubs" – places which bring universities, colleges and research hospitals together with the business community.

Developing networks

Critical mass is also being achieved through networks of collaborative research among a number of universities and hospitals and the private sector. Canadians are learning to do this well, as reflected in the success of the Networks of Centres of Excellence.

Modern communications provide opportunities for smaller institutions to become part of co-operative research enterprises, and helps local communities to participate in the innovation process.

Investing in Research Capability

Canadians know how to do excellent research. However, we risk falling behind in our capacity to carry out leading edge research and technology development unless we foster an environment that will sustain and build on Canada's research strengths.

Modernizing research infrastructure

The nature of research infrastructure – that is, the installations and equipment needed to carry out research – is changing rapidly. The facilities in Canadian educational institutions and research hospitals, put in place largely in the 1960s and 1970s, need to be modernized to meet today's research needs. Important fields of research cannot be explored without adequate facilities and technologies.

Looking ahead, the problem is becoming more acute. The infrastructure needed to do research is becoming more and more sophisticated, as well as more expensive. However, the capacity to carry out state-of-the-art research will clearly depend on putting in place modern equipment, installations and communications networks.

Need for new investment

The federal government has been supporting research at Canadian post-secondary educational institutions and research hospitals for most of the past half-century. This is done primarily through the Granting Councils (the Natural Sciences and Engineering Research Council, the Medical Research Council, and the Social Sciences and Humanities Research Council) and the Networks of Centres of Excellence. The federal government remains the single largest external contributor to university research, providing over $750 million annually in direct grants. However, these programs mainly support the costs of research itself and provide very little support of research infrastructure.

Financial contributions to universities and hospitals are, in general, increasing. Canadians, both individually and through voluntary organizations, have been making significant contributions to university and hospital research. The private sector has also been increasing its support for universities and hospital-based research but this, too, tends to be oriented toward the costs of research itself, rather than the underlying costs of research infrastructure.

Filling this research infrastructure "gap" requires new investment. However, our post-secondary educational institutions and research hospitals cannot solve the problem alone, particularly while struggling to meet the needs of basic scientific research, and at the same time fulfil their educational and health functions.

2

Canada Foundation for Innovation

To help meet the research infrastructure challenge, the federal government in the 1997 budget is proposing the creation of the Canada Foundation for Innovation.

Independent Corporation

The Foundation will represent a new way of strengthening education and research. It will be an independent, not-for-profit corporation that will operate at arm's length from the federal government. The Foundation's board of directors will be responsible for deciding which projects should receive support and how funds will be allocated.

The board of directors will be comprised of experienced individuals, drawn primarily from the research and business communities. The federal government will appoint a minority of directors, including the chair.

The Foundation will be supported by a small secretariat, and will draw on the expertise and peer review assessment procedures of the Granting Councils. This will avoid duplication and ensure that the highest standards of judgement and specialized expertise are applied to the selection and funding of projects.

Canada Foundation for Innovation

Proposed objectives:

- to support economic growth and job creation, as well as health and environmental quality through innovation;
- to increase Canada's capability to carry out important world-class scientific research and technology development;
- to expand research and job opportunities for young Canadians;
- to promote productive networks and collaboration among Canadian post-secondary educational institutions, research hospitals and the private sector; and
- to promote these national objectives in a regionally sensitive way.

Up-front investment

The Foundation will be supported by an up-front investment by the federal government of $800 million. This principal amount and accrued interest will enable the Foundation to contribute, on average, about $180 million annually over five years to research infrastructure projects.

Partnerships

The success of the Foundation will depend on the response of Canadians to the research infrastructure challenge. The funding provided by the Foundation will be used to promote partnerships among public research institutions and a wide range of contributors – the private sector, the voluntary sector, individual Canadians and, to the extent they wish to participate, provincial governments.

The board of directors of the Foundation will have flexibility in determining the extent of the Foundation's contribution to individual projects. Contributions by the Foundation are expected to average 40 per cent of total eligible project costs, but will in no case exceed 50 per cent.

On this basis, funding by the Foundation is expected to trigger roughly $2 billion in support of research infrastructure over five years.

Eligible applicants

The proposed Foundation will accept applications from universities and colleges engaged in research, research hospitals, and associated not-for-profit research institutes and organizations.

It will complement, not duplicate, the role of the Granting Councils, the Networks of Centres of Excellence and the National Research Council. It will not support projects of government departments, agencies or Crown corporations.

Focus

The funds provided to the Foundation, while significant, cannot be expected to fund all research-related infrastructure pressures in public institutions. They will therefore be targeted toward key needs in the areas of health, environment, science and engineering.

They will cover capital costs involved in modernizing the infrastructure needed to do research in these areas, such as acquiring state-of-the-art equipment, establishing computer networks and communications linkages, and creating significant research data bases and information-processing capabilities. They will also cover upgrading of laboratories and installations or, in some instances, new construction where this contributes to the cost-effective realization of research objectives (see Annex).

The Foundation will not fund the "operating" costs of research, such as salaries, regular maintenance or the ongoing operation of facilities.

Criteria and priorities

To receive funding, proposals should demonstrate through a business plan:

- the planned partnership arrangements with other contributors;
- long-term sustainability through, for example, a complementary commitment to cover operating costs; and
- cost-effectiveness and meaningful performance review mechanisms and benchmarks.

The development of detailed project criteria and the selection of projects will be the responsibility of the Foundation's board of directors. Priority will be given to projects that:

- enhance quality and excellence in research and contribute to Canada's economic development and quality of life;
- create opportunities to strengthen the cadre of Canadian research personnel, and attract and retain researchers in Canada;
- involve partnerships among the research community, the private sector and the voluntary sector; and
- promote sharing and more efficient use of research resources within and among institutions.

Timing

The government will be tabling legislation to create the Foundation. Once established, the Foundation's board of directors will subsequently indicate how it intends to proceed with the consideration of project proposals.

3

Research Infrastructure and Innovation

"Government must look beyond the next year or two, and focus as well on longer-term economic growth and job creation. In short, we must broaden our notion of infrastructure. We must take it beyond its traditional meaning, to include the components of future economic success – education, knowledge, innovation, for example. These are the building blocks of the new wealth of nations and it is in this infrastructure as well that the government must invest. If we fail to do so, we will fail the country of tomorrow. We will short change the next generation."

Paul Martin
budget speech
February 18, 1997

Promoting Jobs and Growth

The proposed Foundation is part of the government's strategy for creating the conditions for future economic growth and job creation.

The future prosperity of Canadians is tied to their ability to develop, adapt and use knowledge, and to put it into use in the form of new products, processes and technologies. It is by exercising our intellectual and innovative capacities that Canadians will prosper. Excellence in education for Canadian young people and global competitiveness for Canadian companies go hand in hand.

Technological change results in a shift away from jobs with lower skills and creates jobs that are more productive, higher skilled and thus better paid. Over time, this leads to a more competitive economy, higher overall employment and an increasing standard of living.

Countries that succeed typically have a great capacity for innovation, which attracts investors and increases the capacity of the economy to grow. As a result, countries that are innovation leaders are better able to position themselves in global markets.

Innovation is not limited to "high tech" industries such as telecommunications, computers, aerospace, biotechnology and pharmaceuticals. Canada's traditional industries – manufacturing, agriculture, forestry, mining and oil and gas – also have a tremendous stake in new technologies and have been among the country's most innovative and productive industries.

Improving Health and Environmental Quality

The proposed Canada Foundation for Innovation will also make an important contribution to improving the quality of life of Canadians.

Canadians are justifiably proud of their innovations in health care from insulin through to the development of the electron microscope, cobalt radiation treatments, the discovery of the gene responsible for cystic fibrosis, and the mechanical heart. These scientific discoveries and applications by Canadian researchers have contributed immeasurably to our understanding of health and disease and the means to combat threats to health. Health research not only produces new products and services that improve the quality of life of Canadians, it also forms the basis of pharmaceutical, biotechnological and other industries of vast potential.

More recently, Canadians have also begun to apply their innovative skills to solving environmental problems and developing solutions, including substitutes for toxic processes, the reuse of materials and the control and elimination of harmful emissions. This has given rise to not only improvements in the quality of life but also prosperity through a growing market for environmental products and services at home and abroad.

Other Support for Research and Technology

The Foundation will complement other support that the federal government is providing to research and development.

A key to successful innovation is a thriving private sector that invests in research and technology. The federal government provides substantial encouragement to the development and application of research and technology in the private sector through the scientific research and experimental development (SR&ED) tax credit (about $1 billion annually in incentives) and the labour-sponsored venture capital corporations (LSVCCs) through which Canadians have invested around $3 billion in high technology enterprises.

In the 1996 budget, the government also provided a $50 million equity injection to the Business Development Bank for lending to knowledge-based export-oriented firms for the commercialization of technologies. It also created Technology Partnerships Canada which provides about $250 million annually.

The Foundation will also complement the Health Services Research Fund, announced in the last budget, with a $65 million contribution to promote research in health services over five years. This fund picks up where clinical research leaves off to examine the effectiveness of health services, the outcomes of accepted procedures, and variations in service delivery patterns.

The Canadian Networks of Centres of Excellence (NCEs) link researchers across the country and private sector participants through networks in 14 areas. These range from bacterial diseases, genetic diseases, respiratory health, neuroscience, protein engineering and health evidence application to telecommunications, robotics and intelligent systems, microelectronics networks, mechanical wood pulps, sustainable forest management, concrete, intelligent sensing for innovative structures, and telelearning. The 1997 budget renewed the NCEs with a commitment of $47 million annually.

The 1997 budget also announced that the National Research Council's Industrial Research Assistance Program, which promotes the diffusion of technologies especially to small business, is being maintained at $96 million annually.

Annex

Some Typical Research Infrastructure Needs

Rapidly changing technology makes it impossible to indicate now what particular research projects are likely to be funded by the Foundation. These decisions will be the responsibility of the board of directors.

However, the following provides some general illustrations of the kinds of research infrastructure projects the Foundation might consider. They should not be interpreted as endorsements of any particular projects, nor do they illustrate the range of potential projects.

First Opportunities

In the competition for the best young researchers, the deciding factor is often a university's ability to offer start-up funding for a laboratory or other research facility. Canadian universities and research hospitals need top-notch equipment and facilities in order to provide the environment to encourage the most promising young researchers to remain in or return to Canada to establish their careers. First Opportunity grants would provide substantial strategic leverage in renewing the human capital of Canadian universities and research hospitals across Canada.

Laboratories and field stations

The private sector is increasingly looking to universities and hospitals to carry out research with downstream commercial potential.

To do so, institutions need facilities that meet current industry standards. World-class research in areas ranging from biotechnology to high energy physics to the environment needs to be conducted in laboratories with instrumentation, information-processing and materials-handling systems that meet the highest technical standards as well as health and safety requirements.

Communications linkages

New developments, such as high-speed communications for the sharing of huge data files and high definition images, enable entirely new kinds of research to be undertaken. Providing access to modern communications links also enables teams of researchers to work together on projects – as well as enabling smaller and remote institutions to participate in leading edge research in Canada and worldwide.

Research data bases

The infrastructure of the knowledge society no longer consists primarily of bricks and mortar – it is information and the means to store and access information. Today's advances in medical epidemiology and in most fields of science and engineering depend on vast data bases and on the software that permits these data to be searched and manipulated intelligently. Supporting the creation or acquisition of significant research data bases can help forge an essential link in the innovation process in a growing number of scientific and technical disciplines.

High-speed computing

Computers are general-purpose manipulators of information and are therefore an essential tool in virtually all domains of modern research. Pushing back the frontier in science and engineering depends on greater and greater computing capacity and on new "architectures" of distributed computing and parallel processing. These new designs can support collaboration by researchers at widely separated locations and make available computing speeds that permit entirely new problems to be tackled. Supporting leading edge computing facilities can help Canadians make advances in fields ranging from drug design to cleaner and more efficient fuel combustion to the design of more crash-resistant vehicles.