



Natural Sciences and Engineering
Research Council of Canada

Conseil de recherches en sciences
naturelles et en génie du Canada



Investing in people, discovery and innovation

Report on Plans and Priorities

2004-2005
Estimates

David L. Emerson
Minister of Industry

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List of Abbreviations

ACCC	Association of Canadian Community Colleges
AGENO	Accelerator Grants for Exceptional New Opportunities
AUCC	Association of Universities and Colleges of Canada
BSE	Bovine Spongiform Encephalopathy
CAGS	Canadian Association for Graduate Studies
CFI	Canada Foundation for Innovation
CGS	Canada Graduate Scholarships
CIHR	Canadian Institutes of Health Research
CLS	Canadian Light Source
CRD	Collaborative Research and Development
FTE	Full-Time Equivalent
HQP	Highly Qualified People
I2I	Idea to Innovation
IP	Intellectual Property
IPM	Intellectual Property Management
MC	Modern Comptrollership
MFA	Major Facilities Access
NATO	North Atlantic Treaty Organisation
NCE	Networks of Centres of Excellence
NGO	Non-Governmental Organisations
NRC	National Research Council Canada
NRCan	Natural Resources Canada
NSE	Natural Sciences and Engineering
NSERC	Natural Sciences and Engineering Research Council of Canada
OCIPEP	Office of Critical Infrastructure Protection and Emergency Preparedness
OECD	Organisation for Economic Co-operation and Development
PGS	Postgraduate Scholarships
R&D	Research and Development
RMAF	Results-based Management and Accountability Framework
RPP	Report on Plans and Priorities
RTI	Research Tools and Instruments
S&T	Science and Technology
SME	Small and Medium-Sized Enterprises
SPARK	Students Promoting Awareness of Research Knowledge
SPG	Strategic Project Grants
SRO	Special Research Opportunity
SSHRC	Social Sciences and Humanities Research Council of Canada
TBS	Treasury Board Secretariat
TSE	Transmissible Spongiform Encephalopathy

1. Messages

1.1 *Minister's Portfolio Message*

As Minister of Industry, I am proud to report on Industry Portfolio initiatives to foster the creation and growth of a thriving, innovative economy. Through the programs of the Natural Sciences and Engineering Research Council (NSERC) and the other federal departments and agencies that make up the Industry Portfolio, we have encouraged progress on a number of priorities for Canadians, including improving Canada's business environment, continuing investment in the creation and commercialization of knowledge, building a skilled workforce, strengthening our communities, increasing health research and advancing sustainable development.

Canada is gaining recognition as a world leader in the knowledge economy. This is due in part to our significant investments in advanced research and ground breaking developments by Canadians in new technologies. By increasing our focus on research and development and working in partnership with Canadian firms, post-secondary institutions and not-for-profit organizations, we have stimulated innovation and have improved the productivity and competitiveness of Canadian businesses.

In the coming years we must make a concerted effort to improve Canada's performance even further by achieving greater successes in the industries that have brought Canada to where it is today. We must make it a priority for our businesses, large and small, to be leaders in developing the enabling, transformative technologies of tomorrow. As part of our commitment to building a thriving 21st century economy, we will foster the creation and growth of innovative Canadian companies by strengthening our focus on science and technology, increasing the commercialization of university research, and improving access to early-stage financing.

We are committed to supporting small business access to markets, promoting leading-edge technologies with emphasis on the health and environmental sectors, and information and communications technologies (ICTs) sectors, and promoting the development of value-added industries, particularly those related to the resource sectors. We will make our expertise available to the small businesses that drive the social economy, and we will collaborate with key stakeholders to widen the scope of programs currently available to small and medium-sized enterprises to include social enterprises.

These initiatives will build upon the excellent work that has been achieved to date by the Department and its Portfolio partners. Their work will continue to drive Canada's economic growth in the future and allow us to seize opportunities that present themselves, enabling us to leverage and showcase Canadian creativity and expertise in the global marketplace.

It is my pleasure to present the *Report on Plans and Priorities* for NSERC. This report describes NSERC's anticipated achievements and results over the next three years as we embark on building an economy for the 21st century.

NSERC invests in Canada's capability in science and technology to provide Canadians with a highly qualified workforce, new knowledge, and the creative and productive use of that knowledge to fuel innovation in our knowledge-based economy. NSERC does this by supporting university-based basic and project research, awarding scholarships and fellowships to young researchers, and facilitating links between the universities, colleges, governments and the private sector. NSERC's investments in people, discovery, and innovation will continue to promote research excellence and ensure that Canada can compete successfully with the best the world has to offer. The increased funds announced in Budget 2004 will support additional new opportunities for new and talented researchers, and help promote the translation of knowledge into commercial and social benefits for Canadians.

We are on our way to ensuring that Canada remains a nation with unique strengths that supports a growing economy and values social enterprise, a country where we can continue to build a better standard of living with quality jobs and competitive wages. We must create opportunities and overcome the economic and social challenges that will arise. In short, we must commit ourselves to the pursuit of excellence, leveraging the ingenuity and creativity of our people.

David L. Emerson
Minister of Industry

MANAGEMENT REPRESENTATION STATEMENT

I submit, for tabling in Parliament, the 2004-2005 Report on Plans and Priorities (RPP) for the Natural Sciences and Engineering Research Council of Canada (NSERC).

This document has been prepared based on the reporting principles and disclosure requirements contained in the *Guide to the Preparation of the 2004-2005 Report on Plans and Priorities*.

- It accurately portrays the organisation's plans and priorities.
- The planned spending information in this document is consistent with the directions provided in the Minister of Finance's Budget and by TBS.
- It is comprehensive and accurate.
- It is based on sound underlying departmental information and management systems.

The reporting structure on which this document is based has been approved by Treasury Board Ministers and is the basis for accountability for the results achieved with the resources and authorities provided.

Thomas A. Brzustowski, President
Natural Sciences and Engineering Research Council

Date

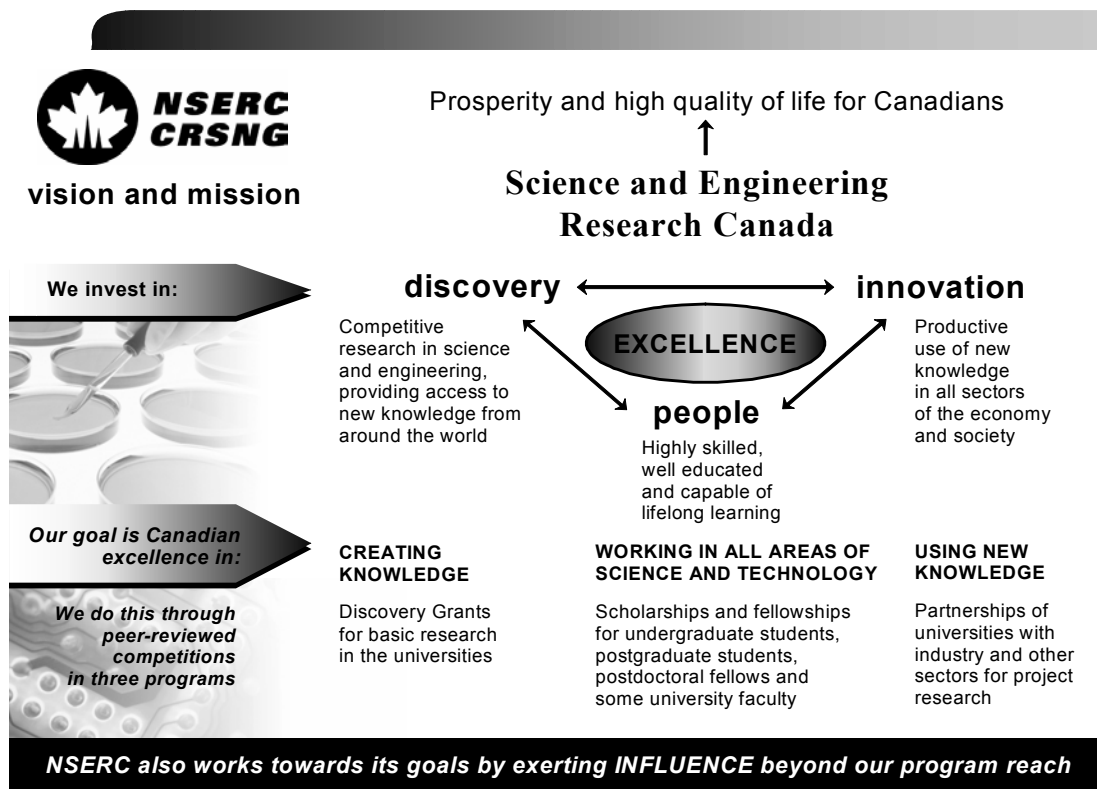
2. Raison d'être

NSERC invests in people, discovery, and innovation to build a strong Canadian economy and to improve the quality of life of all Canadians.

NSERC achieves its mandate by awarding scholarships and research grants through peer-reviewed competition, and by building research partnerships among universities, colleges, governments and the private sector.

NSERC recently received approval to change its Federal Identity Program (FIP) title to Science and Engineering Research Canada. The FIP title will be used in future documents; however, the 2004-05 RPP will continue to refer to the Council's previous FIP title, the Natural Sciences and Engineering Research Council of Canada.

Figure 1: Graphic Representation of NSERC Activities and Goals



3. Planning Overview

3.1 *Planning Context*

The Government of Canada, through the Innovation Strategy, has set a goal of making Canada among the top five Organisation for Economic Co-operation and Development (OECD) countries in research and development (R&D) investment per capita by 2010.

NSERC, the primary federal agency investing in postsecondary research and training in the natural sciences and engineering (NSE), is an integral part of this ambitious strategy:

- To reach its goal, Canada will require many more Highly Qualified People (HQP) trained at Canadian universities and colleges. In order for Canada to realize its goal of ranking among the world's top five R&D performers, NSERC estimates that approximately 100,000 new R&D employees will be required at various levels of qualification across all fields. NSERC investments in the training of HQP are critical to meeting this challenge and unlocking Canada's R&D potential.
- NSERC's support for the creation of new knowledge through the funding of basic university research benefits Canada's innovation system by creating new knowledge and ensuring informed access to scientific information from around the world. Canadian universities are responsible for a larger portion of the nation's R&D expenditures than almost any other country in the OECD. Canadian university researchers are making the discoveries in basic and applied sciences that are the foundation for a knowledge-based economy, and Canadian universities are employing an increasing number of professors active in research. Programs supporting basic research are the largest funding commitments within NSERC's budget, and supporting excellent newly-appointed Canadian professors is NSERC's top priority.
- Our innovation system also benefits from the dissemination and commercialization of this new knowledge in Canada through NSERC-supported partnerships among universities, colleges, governments and the private sector. NSERC's investments in research partnerships allow NSERC to leverage R&D resources from these partners in order to create economic and social benefits for all Canadians, the ultimate goal of Canada's Innovation Strategy.

3.2 *NSERC's Plan*

In 2004-05, NSERC will invest its net planned spending of \$849.6 million¹ in support of three core priorities – people, discovery and innovation – at Canadian universities and colleges. NSERC investments support basic and project research, they support the education of young people in that research, and they encourage research collaborations and partnerships. These investments build Canada's capabilities in science and technology and support innovation that

¹ Including planned administration costs of \$36.7M to deliver these investments and fulfill NSERC's mandate.

drives the economy and improves the quality of life of all Canadians. For a more detailed discussion of the economic and social benefits achieved through NSERC support, refer to the [*2002-03 NSERC Departmental Performance Report*](#).²

In addition to the continuing commitment to funding its core programs, NSERC has adopted a new Vision that will have it acting increasingly as a national agency, delivering its mandate at the local level. The NSERC Vision will address several key challenges in the areas of improving the training of HQP, maximizing the potential of all of Canada's universities to make discoveries, and ensuring Canada's Innovation Strategy includes those who are able to act on innovation opportunities at the community level. These Vision initiatives are being addressed through a series of projects that are discussed in [Section 4.3](#).

² http://www.nserc.gc.ca/about/PIR/dpr03_toc_e.htm

4. Plans and Priorities by Strategic Outcome

4.1 Summary

- All NSERC plans and priorities relate to one strategic outcome, illustrated in Figure 2:

Figure 2: NSERC Plans and Priorities by Strategic Outcome

Strategic Outcome	Priorities	Associated Resources ³				Type of Priority (Ongoing / New)
		\$			Full-Time Equivalents ⁴	
		2004-05	2005-06	2006-07	All Years	
To provide Canadians with economic and social benefits arising from the provision of a highly skilled workforce, knowledge transfer of Canadian discoveries in the natural sciences and engineering from universities and colleges to other sectors, and informed access to research results from around the world.	1. Investing in people	\$274.3M	\$283.8M	\$290.6M	110	Ongoing
	2. Funding the discovery process	\$339.8M	\$341.1M	\$341.4M	80	Ongoing
	3. Helping Canada innovate	\$159.8M	\$158.0M	\$156.6M	118	Ongoing

These priorities reflect the three general methods of support that NSERC provides:

- Scholarship and fellowship support to students from the undergraduate to postdoctoral levels;
- Research grants (including NSERC's largest single program, the Discovery Grants Program) to fund university-based researchers performing basic research;
- Support for project research to foster university and college collaboration with industrial and governmental researchers and entrepreneurs.

³ Associated Resources do not include \$39 million in increased funding identified in Budget 2004. Allocation of this funding increase will be confirmed following approval from Treasury Board expected in summer 2004. Other resources include \$36.7M, \$36.5M, and \$35.8M for the next three years for the administration of the organisation as a whole, including \$2.4M per annum for the administration of the Networks of Centres of Excellence (NCE) program.

⁴ Number of Full-Time Equivalents (FTEs) by priority is an estimate as services are provided to all priority areas by common divisions (i.e. Finance, Council Secretariat, etc.). FTEs include staff allocated to NSERC Vision initiatives.

In practice, these different funding mechanisms frequently contribute to more than one of NSERC's three priorities. For example, on average, 35 percent of the grant money awarded to professors through the Discovery Grants program is spent on the training of students and fellows. Furthermore, through its university-industry partnerships programs, NSERC exposes students to the challenges and opportunities available in Canadian industry and provides industry with direct access to talented research students coming out of our universities. These programs help train youth in areas of science and engineering that are relevant to Canadian industry, and therefore they help retain HQP in Canada after graduation. Each of NSERC's priorities – people, discovery and innovation – makes a distinct contribution to help satisfy Canada's demand for HQP.

Budget 2004

The federal budget announced in March 2004 included a \$39 million increase to NSERC's annual base budget that will support additional opportunities for new and talented researchers, and help promote the translation of knowledge into commercial and social benefits for Canadians. To help accelerate the commercialization of university-based research, NSERC will triple the annual investments in programs directly supporting commercialization over the next three years, such as the Intellectual Property Management (IPM) program and the Idea to Innovation (I2I) program.

Increases to specific NSERC programs as a result of the \$39 million budget increase will be announced following approval of NSERC's plan by Treasury Board expected in summer 2004.

4.2 Details on NSERC Priorities

The following sections describe the various programs delivered in order to address NSERC's three priorities. For a comprehensive guide to the programs available through NSERC, visit the [*Program Guide for Professors*](#)⁵ or the [*Program Guide for Students and Fellows*](#).⁶

The goals set out in the Government of Canada's Innovation Strategy paper, [*Achieving Excellence: Investing in People, Knowledge and Opportunity*](#)⁷ represent a significant challenge on many fronts. Key issues related to this challenge, and specifically to each priority, are also discussed in the sections below.

4.2.1 Investing in People

Canadians, equipped with the skills and knowledge required to create value, will enable Canada to be competitive in the global knowledge-based economy. Canada's future capabilities in science and technology depend on today's graduate students and new faculty.

Students and postdoctoral fellows trained with NSERC funding have the skills required to pursue rewarding careers across all sectors of the economy. Including its portion of Canada Graduate

⁵ http://www.nserc.gc.ca/professors_e.asp?nav=profnav&lbi=pg

⁶ http://www.nserc.gc.ca/sf_e.asp?nav=sfnnav&lbi=pg

⁷ <http://innovation.gc.ca/gol/innovation/interface.nsf/engdocBasic/3.2.html>

Scholarships (CGS) funding, NSERC will invest \$113.5 million in these researchers through scholarship and fellowship programs in 2004-05.

NSERC supports Industrial Research Chairs to help universities build the critical mass of expertise and long-term relationships with corporate partners in areas of research that are of importance to industry. Industrial Research Chairs can also enhance the ability of universities to recruit senior-level researchers and research managers from industry or other sectors. NSERC will invest \$17.1 million through this program in 2004-05.

NSERC and the other granting agencies, the Social Sciences and Humanities Research Council (SSHRC) and the Canadian Institutes of Health Research (CIHR), manage the investments of the Canada Research Chairs program. The key objective of this program is to enable Canadian universities, together with their affiliated research institutes and hospitals, to achieve the highest levels of research excellence and become world-class research centres in the global, knowledge-based economy. To reach this objective, the program aims to attract and retain excellent professors in Canadian universities.

A summary of the planned results and resource allocations within NSERC's priority of Investing in People can be found in Figure 3. For all activities listed as "New", refer to [Section 4.3](#) for further details.

Figure 3: Investing in People

Planned Results	Key Related Activities	Type of Activity	Resources ¹ (millions of dollars)		
			2004-05	2005-06	2006-07
Highly qualified people, expert in research in the natural sciences and engineering, able to pursue various knowledge-intensive careers within industry, government and other sectors of the economy.	Provide research training support to undergraduate, master's and doctoral students, and postdoctoral fellows. This is done by:				
	<ul style="list-style-type: none"> Providing direct support: awarding scholarships and fellowships, some in partnership with industry, to selected individuals through national competitions; 	Ongoing	113.5 ²	122.2 ²	128.8 ²
	<ul style="list-style-type: none"> Providing indirect support: a professor may hire a student or postdoctoral fellow using an NSERC research or partnership grant. 	Ongoing	<i>(Indirect support estimated at: 155.5 155.3 154.7 is counted in figures 4 and 6.)</i>		
Enhanced ability to recruit the next generation of scientists and engineers among today's youth.	Provide targeted support to address the under-representation of women and Aboriginal peoples in faculty positions in the NSE, and support people conducting research in Canada's North.	Ongoing	6.9	6.9	6.9
	Recognize significant work in encouraging Canadians to learn more about science and engineering and promote these disciplines as career choices through three programs: the Michael Smith Awards for Science Promotion; PromoScience; and the NSERC SPARK program.	Ongoing	2.6	2.9	2.9
	Create Centres of Research for Youth in Science Teaching and Learning.	New	1.0	1.0	1.0
Canadian universities achieve high levels of research excellence and become world-class research centres in the knowledge-based economy.	Manage the investments of the Canada Research Chairs program along with the other federal granting agencies (SSHRC and CIHR).	Ongoing	133.2 ³	133.2 ³	133.2 ³
	Support Industrial Research Chairs to build critical mass in research areas of importance to industry.	Ongoing	17.1	17.6	17.8

1. Specific increases arising from the \$39 million increase announced in Budget 2004 are not included and will be announced following Treasury Board approval of NSERC's plan. Other resources include \$36.7M, \$36.5M, and \$35.8M for the next three years for the administration of the organisation as a whole, including \$2.4M to administer the Networks of Centres of Excellence.

2. Includes Canada Graduate Scholarships funding announced in Budget 2003.

3. Funding to the Canada Research Chairs program that flows through NSERC. More information on the Canada Research Chairs program can be found in the SSHRC Report on Plans and Priorities.

Recent Initiatives to Invest in People

Canada Graduate Scholarships

The Canada Graduate Scholarships (CGS) program announced by the Government of Canada in Budget 2003 is administered by the three federal granting agencies. These prestigious awards support Canada's top graduate students in their studies at Canadian universities and complement NSERC's existing Postgraduate Scholarships (PGS) program. NSERC delivers an efficient application and review process for these two programs by holding a single competition each year. The highest ranked awardees within this competition will be offered the CGS award. Students may not hold both awards at the same time and are limited to a combined total of four years of support.

PGS awards have also been modified to mirror the tenure of the new CGS awards. Master's PGS awards now have a standard duration of one year, while the doctoral level now provides up to three years of support. In addition to harmonizing the duration between the two programs, this may have the added advantage of encouraging students to reduce the time it takes to complete their master's degree, an objective of NSERC's HQP strategy as detailed in the report, [*Investing in People – An Action Plan*](#).⁸

NSERC will invest \$15.9 million in 2004-05 to implement the CGS program, rising to \$24.9 million in 2005-06 and to \$31.5 million in 2006-07. Across all university-based and industrial postgraduate scholarships and fellowships programs, NSERC will invest \$113.5 million, \$122.2 million, and \$128.8 million in the next three fiscal years, respectively.

Northern Research Internships

In Budget 2003, the Government of Canada encouraged the three granting agencies to increase their support for Northern research. NSERC is responding to this challenge in part by establishing a new program to support students and fellows conducting research in the North.⁹

The new Northern Research Internships will provide up to \$10,000 to students who are traveling to Canada's North to conduct research. A contribution of at least \$4,000 is required by a northern partner such as a college, government department, company, non-governmental organisation (NGO), or community. In 2004, a total of 10 awards will be available, increasing to a maximum of 30 in the final year of the planning period (2006-07). As always, the excellence of the applicant and the research will be a critical component of the evaluation process. For information on other recent NSERC initiatives to support northern research, refer to Recent Initiatives to Fund the Discovery Process in [Section 4.2.2](#).

Investing in People - An Action Plan

In support of the Government of Canada's ongoing commitment to building a 21st century economy, NSERC's Council adopted an Action Plan to help ensure a reliable and appropriate supply of HQP in the natural sciences and engineering. Adopted in June 2003, the plan is a

⁸ http://www.nserc.gc.ca/about/actionplan_e.htm

⁹ NSERC defines the North as, "the land- and ocean-based territory that lies above the line of discontinuous permafrost, from northern British Columbia to northern Labrador."

flexible five-year strategy to guide investments. It involves early actions addressed through recent funding decisions as well as future priorities for policy and program development. The plan also demonstrates how NSERC investments in people, discovery and innovation are mutually reinforcing with respect to the development of HQP. For example, it considers the environment in which graduate training takes place, the skills required for a 21st century economy, and the means to attract and retain HQP in Canada after graduation.

The plan reflects the views and priorities expressed by NSERC stakeholders through workshops held in five major cities in the spring of 2002 and reported in the [*NSERC HQP Workshops – Final Report*](#).¹⁰ To monitor progress against the objectives of [*Investing in People – An Action Plan*](#),¹¹ NSERC staff will report to Council annually on the plan's implementation and its continued relevance. Where appropriate, the plan will be revisited to adjust to changing circumstances in the funding, research and public policy environments to which it responds.

PromoScience

The PromoScience program supports organisations involved in the promotion of science and engineering to Canadian youth. By supporting these ongoing promotion activities, NSERC expects to help increase the numbers of students pursuing studies and considering careers in science and engineering.

The eligibility criteria of the PromoScience program has been changed to allow non-profit organisations to hold more than one award provided the awards fund different activities. Also, museums may now receive funds for programs conducted on-site. All science centres and conservation centres are now eligible for funding.

NSERC will invest \$2.6 million through the PromoScience program in 2004-05.

Summer Program in Japan or Taiwan

The Japan Society for the Promotion of Science and the National Science Council of Taiwan provide master's and doctoral students in the NSE with a summer research experience in Japan or Taiwan, an introduction to the science and policy infrastructure of the respective locations, and an orientation to the country's culture and language. The program provides students with a unique research experience and also serves to strengthen research collaboration between Canada and the host countries.

The summer program in Taiwan will be available to Canadians for the first time in 2004, and master's students will now be eligible to apply to the Japanese program.

¹⁰ <http://www.nserc.ca/about/hqp.htm>

¹¹ http://www.nserc.gc.ca/about/actionplan_e.htm

Challenges NSERC Faces to Invest in People

Doubling Graduation Rates

To move Canada into the world's top five countries in terms of R&D intensity per capita also implies a very significant increase in the number of highly qualified people available to conduct the increased volume of R&D.

Canadian universities annually award about 2,000 doctoral, 5,000 master's, and 27,000 bachelor's degrees in engineering, mathematics, and science. Even after allowing for increases in other sources of HQP – immigration, repatriation, and retraining – the graduation rate of HQP from Canadian universities at the master's and doctoral levels in the NSE will need to at least double to meet the goals set out in the Innovation Strategy. Graduation rates depend on both the numbers of graduate students enrolled and the time that it takes to complete a degree. Some evidence suggests completion times have been getting longer for decades, and the time from the completion of a bachelor's degree to a Ph.D. has reached eight years in some disciplines. Should this trend continue it will make the Government of Canada's goals of increasing the numbers of HQP more difficult to achieve.

Professional Skills

It is anticipated that a very large proportion of new graduates with advanced degrees will be hired into industry. Consequently, their graduate education will have to ensure they acquire skills that are important for work in the private sector. These include the capacities for team work, for finding and using knowledge from outside of their own field, for project management, for entrepreneurship, for developing a business plan, etc. Teaching such skills is not new; the novelty lies in the need to routinely integrate such skills into graduate education in the NSE.

NSERC continues to investigate how it may influence the development of professional skills curricula. NSERC's criteria for a number of its scholarship programs include consideration of a candidate's communication skills and leadership abilities. Scholarship programs at all postsecondary levels are offered specifically to students who will spend time developing such skills in the private sector while continuing their studies and research.

Opening the Door Wider

Canada's young scientists and engineers benefit from exposure to international research opportunities at an early stage of their careers: such experience benefits Canada when these researchers return and are able to improve the quality of their research careers in Canada. The current distribution of Canadian researchers in international labs is concentrated in a handful of countries such as the United States, the United Kingdom, France, Germany, and Switzerland. However, there are many world-class labs that may be found outside of these more prominent countries, and Canada would benefit from greater Canadian participation at these labs as well. NSERC is working to increase the opportunities for Canadians to access the best labs in the world.

One example of such collaboration is NSERC's support of the [Math in Moscow](#)¹² program that provides undergraduate or early master's students in mathematics or computer science a 15-week research experience at the Independent University of Moscow. The Summer Program in Japan or Taiwan described [above](#) also provides opportunities for Canadian students to obtain international research experience.

4.2.2 Funding the Discovery Process

NSERC investments give Canadian professors the opportunity to contribute to and access the latest international research in order to extend the boundaries of our knowledge in all areas of the NSE. Basic research driven by a professor's interests creates the new knowledge that is the foundation for innovation, and provides students with the critical research experience they need to contribute to a knowledge-based economy. NSERC-funded research has led directly or indirectly to the creation of new value-added products, processes, businesses and industries in Canada. *Research Means Business*, an NSERC publication now in its third edition, presents 134 first-generation start-up companies that were spun out of NSERC-funded university research (this publication can be obtained by contacting distribution@nserc.ca). Investments in knowledge creation also help determine policies, standards, and regulations; for example, in the area of environmental protection.

With NSERC funding, Canadian professors in all areas of the NSE strengthen their research capabilities. Armed with this knowledge and working increasingly in partnership with industry, they help fuel Canada's innovation system. Canadian scientists and engineers are respected throughout the world for the high calibre of their research and their leading-edge discoveries and projects. Annually, more than 9,000 professors are funded through Discovery Grants, NSERC's largest program by budget (\$283.7 million in 2004-05, 35 percent of NSERC's budget), and other research grants.

NSERC also funds the discovery process by assisting in the purchase of research equipment through the Research Tools and Instruments (RTI) program, and in funding the costs of running large-scale facilities through the Major Facilities Access (MFA) program. These programs provide Canadian professors with access to the equipment and facilities necessary to undertake world-class research. The 2004-05 budget of these two programs is \$22.0 million, which includes an \$8.6 million commitment to the Canadian Light Source (CLS) synchrotron facility at the University of Saskatchewan.¹³

A summary of the planned results and resource allocations within NSERC's priority of Funding the Discovery Process can be found in Figure 4. For all activities listed as "New", refer to [Section 4.3](#) for further details.

¹² http://www.cms.math.ca/bulletins/Moscow_web.html

¹³ The \$8.6M per annum value includes \$3M transferred from the National Research Council (NRC) to NSERC. In addition, CIHR will provide \$2M per annum towards the operating costs of the CLS.

Figure 4 – Funding the Discovery Process

Planned Results	Key Related Activities	Type of Activity	Resources ¹ (millions of dollars)		
			2004-05	2005-06	2006-07
High-quality research capability maintained across all areas of the NSE. New knowledge that is required for innovation.	Invest in research activities of individuals and groups working in leading-edge science and engineering, as well as in the tools, instruments and facilities necessary for this work.	Ongoing	312.0	313.0	312.3 <i>(Approximately 35% is used to pay salaries for students and postdoctoral fellows, as noted under indirect support in Figure 1.)</i>
	Implement the results of the 2002 Reallocations Exercise to adjust spending priorities within the Discovery Grants program.	Ongoing	<i>(Resources reallocated within the Discovery Grants program)</i>		
	Enhance research capabilities of small universities through a Research Capacity Development program.	New	2.2	2.2	2.2
	Establish regional offices to create a local NSERC presence, coordinate some activities within the NSERC Vision, and improve service delivery to clients.	New	<i>(Resources within the administration budget)</i>		
Enhanced ability to contribute to and access leading-edge knowledge from around the world.	Fund time-limited opportunities for interdisciplinary and/or high-risk research projects, both national and international, with potential for significant research breakthroughs.	Ongoing	9.7	10.0	11.0
	Honour excellence with prestigious prizes including a \$1 million research prize, The Gerhard Herzberg Canada Gold Medal for Science and Engineering.	Ongoing	2.3 ²	2.3 ²	2.3 ²
	Administer, on behalf of the Government of Canada, its contribution to the Perimeter Institute for Theoretical Physics	Ongoing	5.0	5.0	5.0
	Administer, on behalf of the Government of Canada, its contribution to the Canadian Light Source synchrotron facility	Ongoing	8.6 ³	8.6 ³	8.6 ³
	Develop a Big Science framework for establishing strategic funding priorities for large-cost facilities and programs	New	<i>(Resources within the administration budget¹)</i>		

1. Specific increases arising from the \$39 million increase announced in Budget 2004 are not included and will be announced following Treasury Board approval of NSERC's plan. Other resources include \$36.7M, \$36.5M, and \$35.8M for the next three years for the administration of the organisation as a whole, including \$2.4M to administer the Networks of Centres of Excellence.

2. New prize announced for 2004 - Brockhouse Canada Prize for Interdisciplinary Research (<http://www.nserc.gc.ca/brockhouse/index.htm>).

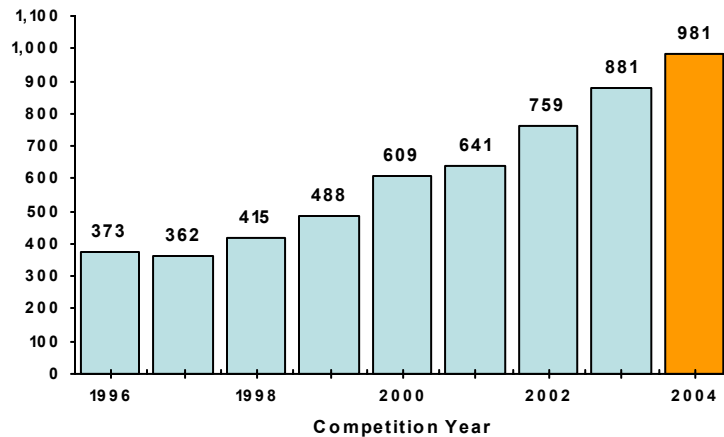
3. Includes \$5.6M from NSERC's base budget and \$3.0M of funds from NRC that flow through NSERC.

Recent Initiatives to Fund the Discovery Process

Pressure to Fund New Professors

NSERC is continuing to increase the funds available for new professors in the Discovery Grants program as the number of first-time applicants continues to increase. Figure 5 clearly shows the increasing number of new professors applying for a Discovery Grant over the last eight years. The number of active researchers retiring has remained stable over the same period at about 250 per year.

Figure 5: Number of First-Time Applicants to Discovery Grants Programs



This trend illustrates the success of government initiatives and policies designed to attract professors capable of high-quality research in science and engineering to Canadian universities. These newly appointed professors, who are hired on the presumption they will immediately be active in research, are critical to Canada's future capabilities in S&T; they generate knowledge and innovations, and also train HQP. Supporting them is NSERC's first priority.

This growth is great news for the future of Canada. However, NSERC cannot fund these excellent new researchers at the expense of existing researchers' funding levels, as this would undermine the government's goal of increasing research productivity at Canadian universities. In last year's competition, NSERC directed \$12.5 million toward new applicants out of a \$55 million increase to its budget. In 2004-05, \$15.5 million will be required in light of the unprecedented numbers of new applicants applying to the program. As noted in the discussion on challenges [below](#), the funds allocated to support these highly capable new researchers have affected important investments in other NSERC programs.

Northern Research Supplements

Budget 2003 encouraged the federal granting agencies to increase their support of northern research. In response, NSERC Council approved several initiatives to encourage and support research in Canada's North.

One such initiative, the Northern Research Supplements program, will support holders of a Discovery Grant who are undertaking research in northern Canada by providing a \$10,000 supplement per year to help cover the logistical costs of conducting research in the North.

NSERC plans to provide 40 supplements per year, awarding eight new five-year supplements per year for a total annual investment of \$400K. For information on other recent NSERC initiatives to support northern research, refer to the Recent Initiatives for Investing in People in [Section 4.2.1](#).

Brockhouse Canada Prize for Interdisciplinary Research

NSERC has created a new [prize](#)¹⁴ to honour the late Dr. Bertram Brockhouse (1994 Nobel Prize recipient in Physics) and his outstanding scientific achievements, to celebrate some of Canada's most outstanding teams of researchers, and to promote interdisciplinary and collaborative research.

The annual award will include a research grant of \$250,000 for a university-based research team.

Special Research Opportunity

In summer 2003, NSERC announced the new Special Research Opportunity (SRO) program further to the recommendation of its Advisory Group on Interdisciplinary Research. Created by merging two former programs and the New Directions area of the Strategic Project Grants (SPG) program, SRO grants enable professors to pursue new and emerging research opportunities at the time they become apparent, or investigate and develop potential new collaborations necessary to respond to national and international opportunities.

This program is the first NSERC program to use a “college” of reviewers (with identified areas of expertise) who have agreed to review specific proposals when and where they relate to their areas of knowledge.¹⁵ This peer-review mechanism is similar to that used by the Engineering and Physical Sciences Research Council in the United Kingdom. NSERC is evaluating this mechanism in its continuing efforts to ensure that the NSERC decision-making process is the most effective means of allocating Canadians' resources within its mandate.

Including ongoing commitments from the former programs, NSERC will invest \$9.7 million through SRO in 2004-05.

Reallocations Exercise Implementation and Review

To ensure that NSERC's funding supports the most important new developments in university research in science and engineering, NSERC reallocates 10 percent of the budget of the Discovery Grants programs every five years. Reallocation decisions are made based on an internationally peer-reviewed exercise to identify target priorities within each discipline in the NSE.

In addition to reallocated funds ear-marked for specific proposals within the regular Discovery Grants competition, two separate competitions arising from the Reallocations Exercise were held for the first time in 2003: the [Accelerator Grants for Exceptional New Opportunities](#)¹⁶ (AGENO)

¹⁴ <http://www.nserc.gc.ca/brockhouse/index.htm>

¹⁵ The Tri-Council Secretariat, of which NSERC is a member, uses this method of peer review for the Canada Research Chairs program.

¹⁶ http://www.nserc.gc.ca/programs/ageno_comp_results_e.htm

in chemistry; and the [Leadership Support Initiative](#)¹⁷ in mathematics. Another competition for the AGENO program is expected in 2005 and will be announced on NSERC's web site in the future.

Finally, NSERC is undertaking a comprehensive evaluation of the Reallocations Exercise itself – the first such study since the establishment of the Reallocations Exercise in 1992 – in order to ensure that NSERC's method of adjusting its funding allocations to specific NSE disciplines is as transparent, responsive, and fair as possible. The results of this evaluation are expected in spring 2005, and will be announced and posted on NSERC's web site.

Challenges NSERC Faces to Fund the Discovery Process

Increased Hiring of Professors into Canada's Universities

An early success for innovation in Canada – enabling the impressive growth in faculty actively involved in university research – poses an increasing challenge for NSERC, which has experienced a sustained increase in qualified first-time applicants for Discovery Grants. The increase in scientists who are establishing their research careers as faculty in Canada's universities has been a trend since the government began increasing investments in university-based research in 1997. Among the 3,014 applicants for 2004, 981 – or 33 percent – were first-time applicants. Against that growth only 259 currently funded professors did not reapply¹⁸. This level of attrition has shown no signs of increasing over the same period of time. This is the largest growth in new applicants that NSERC has yet experienced. Based on continuing consultations with Canadian universities and analyses performed by the Association of Universities and Colleges of Canada (AUCC), NSERC expects these hiring trends to continue, and in fact to increase as universities increase the size of their faculties to meet increases in student enrolment.

This growth in the number of new researchers is great news for Canada in the long-term, but it presents a serious challenge to NSERC in the short term. University hiring processes now include a thorough assessment of research potential (in the case of entry-level appointments) and accomplishment (in the case of senior appointments), using very much the same information that first-time applicants present to NSERC. This means that the people currently being appointed as professors in science and engineering in Canadian universities are very well qualified to do research, and the result is that their success rates in NSERC competitions are high – about 69 percent in 2004-05. The NSERC grant selection committees aim to fund every candidate who meets the high standards of the discipline in peer review. The consequence of this approach is that the funded researchers get, on the average, a grant of only about 45 percent of what they request.

The net increase in the number of university-based researchers represents a potential increase in the nation's capacity for research and training only if these people stay in Canada, develop careers, teach our students, and work with our industry. Therefore, their research must be funded

¹⁷ http://www.nserc.gc.ca/programs/lsi_results_e.htm

¹⁸ The overall number of professors in the NSE at Canadian universities is currently relatively stable; however, many professors who are not now or never were active in research are retiring, and being replaced by new professors expected to conduct research.

adequately. That funding should not come at the expense of successful researchers already in Canadian universities, as that would not support what the government is trying to achieve in terms of the Innovation Strategy. NSERC has managed this pressure in recent years only by limiting growth in other critical programs such as RTI, MFA, Industrial Research Chairs, and Research Networks. Even within the Discovery Grants program itself, the average grant level for funded professors has not increased since the government's re-investment in university research. The additional funds allocated to this program since 1997 have supported the increasing numbers of excellent researchers applying to the program, but have not allowed for increases to researchers' funding levels to offset increases in the cost of performing research.

Maximizing the Return on Federal Investments in Research

The important investments in infrastructure made by the Canada Foundation for Innovation (CFI) and its funding partners is but one example of the Government of Canada's ambitious agenda to improve support for advanced research in Canada. One challenge, however, is to support the efficient operation of these facilities, especially those funded at a time when the CFI did not provide ongoing operational costs. As these early installations begin to run out of funds, many are applying to NSERC's MFA program to provide the operational costs of running these important facilities. This places further pressure on NSERC's budget.

Similarly, to continue to attract and retain the best professors and create a stimulating research environment in which they can work, NSERC Discovery Grants at internationally competitive levels must be provided to Canada Research Chairs recipients, and to professors collaborating in their research. In addition, these researchers require access to funds through the RTI program to purchase and upgrade research equipment in their labs.

In the two most recent competitions, every new Canada Research Chairs holder in NSE disciplines has applied for a Discovery Grant. In 2003-04, the approximately 450 holders of Canada Research Chairs in science and engineering – half of the eventual number – received a total of \$40 million in grants through all NSERC programs. This disproportionately large amount is explained by the fact that the holders of Canada Research Chairs are among the best of the researchers supported by NSERC, and they do very well in all of NSERC's competitions.

4.2.3 Helping Canada Innovate

To improve their competitive positions, our communities and industries need to take full advantage of Canada's capacity for science-based innovation. NSERC's Research Partnerships programs facilitate the development and exchange of knowledge, technology and people across all sectors to help build Canada's 21st century economy. Through NSERC investments, professors connect with those who can use new knowledge productively and enhance Canada's capacity for innovation. This in turn contributes to wealth creation that benefits all Canadians.

For every dollar NSERC invests in its partnerships programs, almost two dollars is co-invested by active partners. This ratio has improved significantly over the last decade,¹⁹ and demonstrates NSERC's ability to effectively leverage public funding for innovative research projects of

¹⁹ In 1993-94, partners contributed \$1.50 for every dollar that NSERC provided.

interest to industry. In 2003-04 NSERC partnerships involved close to 700 ongoing projects with over 800 industry and government partners.

NSERC offers a flexible and responsive mix of programs and special initiatives in support of innovation. These cover a broad spectrum of activities that includes: targeted research, research networks, joint university-industry projects, technology transfer, and capacity building for the management of intellectual property, including the training of intellectual property management professionals. Six of NSERC's programs that address one or more of these priorities are described below.

Strategic Projects Grants: Through the SPG program, NSERC directs funding to accelerate research and training in targeted research areas. The program invites research proposals that address emerging areas of national importance with the potential for impact on Canada's economy, society and/or environment. The program is a mix of four target areas identified in 1999-2000 by NSERC through an international scan and national focus groups, and special initiatives with partner organisations to address national priorities. The program supports early-stage research projects that have the potential to lead to breakthrough discoveries. In 2001, the following target research areas were introduced for a five-year cycle:

- Biosciences
- Environment and Sustainable Development
- Information and Communications Technologies
- Value-Added Products and Processes

A fifth target area, New Directions, was merged with the SRO program described in [Section 4.2.2](#). Consultations on new target areas will commence in 2004.

Special initiatives, current and planned, under this program include:

- NSERC and the BIOCAP Foundation have in place a [Joint Initiative on the Biosphere and Climate Change Solutions](#).²⁰
- NSERC and the Energy Sector of Natural Resources Canada (NRCan) have partnered to deliver the [Novel Next Generation Technology Initiative in Energy Research and Technology Related to Greenhouse Gas Mitigation](#).²¹
- NSERC and the Canada Council for the Arts have a joint [New Media Initiative](#)²² that stimulates collaboration between artists creating in new media and scientists and engineers developing new technologies.

NSERC will invest \$47.9 million through Strategic Projects in 2004-05.

Collaborative Research and Development Grants: The Collaborative Research and Development (CRD) program is a knowledge and risk-sharing program intended to give companies operating from a Canadian base access to the special knowledge, expertise and

²⁰ http://www.nserc.ca/professors_e.asp?nav=profnav&lbi=toc_b

²¹ http://www.nserc.gc.ca/professors_e.asp?nav=profnav&lbi=ghgm

²² http://www.nserc.gc.ca/professors_e.asp?nav=profnav&lbi=b1a

educational resources at Canadian postsecondary institutions, and to offer opportunities for mutually beneficial collaborations that result in industrial or economic benefits to Canada. This program is market-driven as industry commits to at least half the cost of the research and is involved in the peer review. The leverage is flexible for small and medium-sized enterprises (SMEs), which make up about half of the industry participants in this program. Due to the lack of deadlines, companies have the flexibility to plan and implement their research project as market conditions dictate. Student training, especially in the important areas of practical application of research and professional skills development, is encouraged and retention of these HQP enhanced through these university-industry project grants.

NSERC will invest \$33.8 million through the CRD program in 2004-05.

Research Networks Grants: Research networks promote the building of clusters of expertise across disciplines and sectors. These focused research initiatives can be local or national, and involve university researchers with industry and/or government partners. Such large-scale multidisciplinary research projects are cost-shared among the partners and have a management structure that involves the stakeholders from university, industry, and government. Networks focus on areas such as climate change, photonics, novel techniques to reduce pesticides in agriculture, treating mine tailings, and other areas of importance to Canadians. For details on any of the thirteen currently funded research networks, visit the [Research Networks web site](http://www.nserc.gc.ca/programs/resnet/index_e.htm).²³

NSERC will invest \$18.0 million through Research Networks in 2004-05.

Networks of Centres of Excellence: The Networks of Centres of Excellence (NCE) is a unique and successful federal partnership program administered jointly through NSERC, CIHR and SSHRC in partnership with Industry Canada. The networks are innovative research partnerships among universities, the private sector and governments that address complex problems of critical importance to Canadians.

In 2002-03, 400 companies, 87 federal and provincial government departments and agencies, 28 hospitals, and 62 universities and colleges from Canada and abroad were involved in the NCE program. In addition, more than 280 other organisations such as municipalities, First Nations, NGOs, and professional associations were also involved with the NCEs. The active involvement of Canadian industry provides stimulating training environments and employment opportunities for students. These nation-wide networks connect excellent research with industrial know-how and practical investment.

In a typical year, the 22 currently funded networks will contribute to the development of almost 4,800 HQP, create more than seven spin-off companies, file more than 80 patents and close almost 100 licences, and assist nearly 500 university graduates obtain employment in industry. The networks stimulated outside investments of over \$69 million in 2002-03, including more than \$33 million by participating private-sector companies.

²³ http://www.nserc.gc.ca/programs/resnet/index_e.htm

NSERC will invest \$40.6 million²⁴ through the NCEs in 2004-05. In addition, Budget 2004 included an additional \$5 million a year that will be provided to support the creation of a new NCE network for research on bovine spongiform encephalopathy (BSE) and other transmissible spongiform encephalopathies (TSE), to further support Canadians in their research leadership roles and position Canada as a world leader in TSE/BSE science.

Intellectual Property Management: The Intellectual Property Management (IPM) program is a Tri-Council program designed to strengthen Canadian universities' ability to manage their intellectual property (IP), attract industrial partners, and provide social and economic benefits to Canadians by ensuring new knowledge is developed and commercialized in the most appropriate fashion. In addition, the program increases the awareness among researchers of the issues surrounding IP and helps to train science and engineering-based students and researchers to be IP managers. The program funds a wide range of activities including: providing staffing and operating costs for Industry Liaison Offices, supporting protection of IP, marketing, industrial outreach efforts, and networking.

An expansion of this program was announced in 2002-03. Through the Networked Training Initiative, NSERC provides seed funding for the development of technology transfer and commercialization specialists.

Including the Networked Training Initiative, NSERC will invest \$4.5 million through the IPM program in 2004-05. Furthermore, following Treasury Board approval of NSERC's planned allocation of the Budget 2004 increase, NSERC expects to increase the funding allocated to the IPM program to meet part of its commitment to triple investments in commercialization activities over the next three years.

Innovation Platforms: The Innovation Platforms program allows NSERC to partner with other organisations that share similar goals and objectives. They are designed to support Canadian research in areas that present a high potential for Canada to become a leader in science and technology. NSERC's Innovation Platforms make it possible to quickly intensify research in an important area; accelerate research that cuts across disciplines; translate research results for a greater variety of user sectors and partners; offer higher support to students in very competitive fields; involve government laboratories and scientists; and help Canadian researchers join international projects.

In 2004-05, NSERC will invest \$2 million in two Innovation Platforms: the Nanotechnology Innovation Platform with the goal of accelerating multidisciplinary research and training in nanotechnology and developing a strategic vision to guide future investments; and the NSERC-EMPOWR Innovation Platform that is increasing the supply of highly qualified people (HQP) available to work in Canada's knowledge-based industries in the fields of microelectronics, photonics, optoelectronics, wireless and radio engineering.

A summary of the planned results and resource allocations within NSERC's priority of Helping Canada Innovate can be found in Figure 6. For all activities listed as "New", refer to [Section 4.3](#) for further details.

²⁴ Includes \$2.4M for administration of NCEs.

Figure 6: Helping Canada Innovate

Planned Results	Key Related Activities	Type of Activity	Resources ¹ (millions of dollars)		
			2004-05	2005-06	2006-07
Productive use of knowledge in support of new products, processes, and services, leading to new jobs and businesses.	Lever investments by forging research partnerships with the private sector as well as with other sectors, including government departments and agencies.	Ongoing	64.1	60.6	59.6
	Provide funding for colleges to foster innovation.	New	0.6	1.2	1.8
Accelerate research in target areas of national importance.	Provide funding for university-based project research in target areas of national importance and in emerging areas that are of potential significance to Canada.	Ongoing	47.9	50.0	49.0
	Partner with other organizations through flexible mechanisms that provide leadership, planning, and focus to accelerate research in areas that present a high potential for Canada to become a leader in science and technology.	Ongoing	2.0	1.0	1.0
	Administer the Networks of Centres of Excellence program (along with the two other granting agencies and Industry Canada).	Ongoing	38.2 ²	38.2 ²	38.2 ²
Knowledge base for developing policies, standards and regulations, and making decisions, for government and industry.	Support the commercialization of research results at Canadian universities and the capacity building of intellectual property management professionals.	Ongoing	7.0	7.0	7.0
	Continue a communications strategy specifically aimed at industrial clients to enhance the private sector's awareness of NSERC programs that foster university-industry research collaboration and training.	Ongoing	(Resources within the administration budget.)		

1. Specific increases arising from the \$39 million increase announced in Budget 2004 are not included and will be announced following Treasury Board approval of NSERC's plan. Other resources include \$36.7M, \$36.5M, and \$35.8M for the next three years for the administration of the organisation as a whole, including \$2.4M to administer the Networks of Centres of Excellence.

2. Funding to the Networks of Centres of Excellence that flows through NSERC.

Recent Initiatives to Help Canada Innovate

Idea to Innovation Program

The Idea to Innovation (I2I) program fills a funding gap by bringing university research ideas to the point where they can be transferred to industry and commercialized. The program supports research and development projects with recognized technology transfer potential by providing university researchers with crucial access to early stage financing for technology validation and market connection. This program was launched in the summer of 2003 as an expansion of NSERC's former Technology Partnerships Program. The I2I program helps increase the technology transfer of university discoveries by providing a flexible, two-phase funding arrangement. The first is a proof-of-concept phase where NSERC will support 100 percent of the research; the second phase focuses on technology enhancement, and research costs in this phase are also supported by a private-sector partner.

Including ongoing commitments to the former Technology Partnerships Program, NSERC will invest \$2.5 million through the I2I program in 2004-05. Furthermore, following Treasury Board approval of NSERC's planned allocation of the Budget 2004 increase, NSERC expects to increase the funding allocated to the I2I program to meet part of its commitment to triple investments in commercialization activities over the next three years.

Climate Change

In response to Budget 2003's recommendation to the federal granting agencies to increase their support for climate change research, NSERC will invest a further \$1 million towards climate change research through the Strategic Project Grants program in 2004-05, increasing to \$2 million in 2005-06, and \$3 million in 2006-07. This is in addition to the initiatives already described above in the Strategic Projects and Research Networks programs.

Joint Funding with OCIPEP for Critical Infrastructure Research

NSERC is establishing a joint three-year program with the Office of Critical Infrastructure Protection and Emergency Preparedness (OCIPEP) to co-fund research aimed at better assessing, managing and mitigating the risks to Canadians associated with critical infrastructure interdependencies. Recent events such as the Ontario/US power blackout and computer worms, such as Blaster and SoBig, have highlighted the vulnerability of infrastructures to cascading effects.

An initial workshop is scheduled for 2004 to bring together all interested parties (researchers and users) to discuss the issues and initiate potential collaborations. NSERC will invest \$1 million per year for the three years the program will be in effect.

Entrepreneurship Award

NSERC is in the process of developing a student entrepreneurship award under an agreement with the Canadian Science and Technology Growth Fund (managed by the Technology Investments Management Corporation). Proposed for launch in 2004, the

entrepreneurship award would be judged at the same time as NSERC's [Synergy Awards](#)²⁵ that celebrate excellence in university-industry collaboration. NSERC is still consulting with various interested parties before finalizing the award description and selection details.

Challenges NSERC Faces to Help Canada Innovate

Facilitating the Commercialization of University Research

It has been well documented that universities play a strategic role in strengthening Canada's innovative capacity and productivity performance. Canada's comparative advantage in innovation lies in university research, as countries with whom we compete may have a longer history of engagement in commercialization activities and of funding private research centres that connect research with the global market (such as the Battelle Memorial Institute in the United States or the Fraunhofer-Gesellschaft institutes from Germany). Universities train HQP who create, build, and attract knowledge-based firms. Universities are a major source of ideas for new products and processes that add value and that will contribute to Canada's success in the global market, but there is a need to better link this capacity to the marketplace.

While results from early commercialization activities are promising, expertise and experience in the commercialization of research results is relatively under-developed for many Canadian universities, in particular when compared to the situation in the United States. It is critical that we exploit the discoveries of Canada's research universities. The Tri-Council IPM program administered by NSERC, the pilot training initiative to increase the supply of technology transfer and commercialization experts, and the I2I program are steps in that direction. The new Colleges Helping Community Innovation pilot program launched in spring 2004 as one of NSERC's Vision initiatives will also contribute to using the potential that exists in Canada's postsecondary institutions.

To help accelerate the commercialization of university-based research, NSERC will triple its annual investments in programs directly supporting commercialization over the next three years.

Fostering Greater University-Industry Collaboration

NSERC helps to increase Canada's private-sector R&D investment and performance, and to foster the growth of receptor capacity in industry for new knowledge. NSERC Research Partnerships programs bridge the gap between the university research enterprise and those who can commercialize and exploit the results in order to create wealth. Cost-shared initiatives with industry share both the risks and benefits of research, and reduce the time for adoption of new technologies by Canadian industry.

The private sector is forming partnerships with universities at an increasing rate as universities offer access both to new knowledge and to the HQP who will be able to use that knowledge productively. There has been strong growth in the number of companies

²⁵ http://www.nserc.gc.ca/synergy/about_e.htm

that have contributed to NSERC's collaborative university-industry research programs. However, there remain many Canadian companies that could benefit from increased collaboration with universities for the purposes of R&D.

The creation of regional offices, as described in the next section, will play an important role in increasing NSERC's visibility and accessibility to industrial partners, in particular to small and medium-sized enterprises, throughout Canada.

4.3 *NSERC's Vision*

In June 2003, NSERC's Council unanimously endorsed a new Vision for NSERC.

NSERC invests in people, discovery and innovation through programs that support university research in the natural sciences and engineering on the basis of national competitions, and that will continue to be NSERC's major activity. But in addition, NSERC will reach out across the country to meet important needs in the education of HQP, in research and in innovation that have been brought to our attention. These needs are different in different parts of Canada. To do a good job in meeting them, NSERC will develop a local presence in the regions of Canada.

The philosophy shaping this Vision is that NSERC will begin to act to fill gaps that have been identified in the way that research in science and engineering is dealt with in Canada. NSERC recognizes that conditions and needs vary across the country, and that the public must be involved, both in supporting how government spends money, and in making use of the outputs of the research.

NSERC plans to launch a series of pilot initiatives to address these issues, each of which is described below. NSERC continues to consult with various parties in an effort to incorporate their ideas into the final program designs and regulations. As of April 2004, many of the specific details of the initiatives are almost finalized.

Another component of NSERC's Vision was approved by Treasury Board in December 2003. NSERC is now using the label of Science and Engineering Research Canada. This label does not replace NSERC's legal name; instead, it will allow NSERC to avoid confusion with other government departments when dealing with the general public. Any costs arising from this re-branding will be assumed by the existing administrative budget.

The total projected resources for these pilot initiatives, \$5.8 million²⁶, will come from within NSERC's projected budget for 2004-05. While many of the goals of these initiatives are medium and long-term in nature, these projects will be designed to make it possible to begin to evaluate them after one year. Modern management principles and the findings of a recent capacity assessment are being applied to the management of NSERC Vision initiatives. Business cases and workplans that identify the impact of these

²⁶ This includes approximately \$2M from NSERC's administrative budget, \$1M of which is included under the Planned Spending line for Regional Offices.

initiatives on the human and financial resources of NSERC, including risk management strategies, have been developed and are being monitored by NSERC management (for more information on NSERC's actions related to Modern Comptrollership, refer to [Section 4.6](#)).

The funds allocated to the Vision are small compared to the \$843.8 million available for NSERC's core programs and initiatives, but the Vision represents an important step in addressing a number of issues of great importance to NSERC's overall strategic objective.

Research Capacity Development in Small Universities

	2004-05	2005-06	2006-07
Planned Spending	\$2.2M	\$2.2M	\$2.2M
# FTEs	1	0.5	0.5

Objective: Establish a pilot program to provide funding to small universities to help build the foundations and eliminate the barriers to achieving increased productivity in excellent research.

First Milestone: Invite universities currently receiving less than \$3 million annually from NSERC to submit applications in spring 2004 for the pilot Research Capacity Development program. Results will be announced in summer 2004.

- Estimated number of awards: 8 to 9
- Estimated value of awards: \$200,000 to \$300,000 per year for up to five years

Rationale: Small universities have great potential to assist regional economic development, particularly by increasing their capacity for innovation and collaboration at the local level. However, the problems that hamper researchers at these institutions will not readily be solved through existing programs of research support at NSERC, as the core issue is the capacity of the institution to provide the resources necessary for faculty to conduct high-quality research. Some of their problems are partly addressed by the Indirect Costs Program, but many are not.

Features: Proposals funded through this program will support the underlying requirements essential to produce higher levels of research output, and the needs of different universities are expected to vary according to the particular circumstances of the institution. They will be judged on their potential for contributing to sustainable long-term research capacity development. Initiatives may support personnel costs, they may focus on identifying and nurturing potential partnerships for university-industry projects, they may encourage entrepreneurship, or they may be used to purchase key equipment.

Colleges Helping Community Innovation

	2004-05	2005-06	2006-07
Planned Spending	\$0.6M	\$1.2M*	\$1.8M*
# FTEs	1	1	1

* Increased budget in future years contingent on matching funds identified by the institution.

Objective: To increase the impact of colleges on innovation at the community and/or regional level.

First Milestone: Establish a pilot program in 2004-05 to provide funds to eligible Canadian colleges. Applications will be received in spring 2004 and decisions will be announced in summer 2004.

- Estimated number of awards: 6
- Estimated value of awards: Average \$100,000 per year for the first year, rising to a maximum of \$200,000 in year two and \$300,000 in year three based upon the college's ability to use the additional resources to leverage funds from other sources.

Rationale: Colleges play a significant role in building the capacity for innovation of communities by contributing to the commercialization of new technologies, and by providing the skilled employees needed to work in an innovative industry. However, most colleges do not have the resources to move into this area in a more significant way. NSERC has seen the opportunity to assist colleges in their support of innovation within their communities and to further *Canada's Innovation Strategy*.

Features: NSERC is working with the Association of Canadian Community Colleges (ACCC) to develop the framework and the selection criteria for the pilot program. The specific activities that will be funded will vary according to the situation of the particular college and its community. Funded proposals may include some of the following aspects: allowing college researchers to dedicate time to innovation programs and projects; supporting students involved in innovation activities, or; responding to the needs and activities of local industry. Colleges may also work with universities to take university discoveries to the marketplace through product development activity.

Big Science Framework

	2004-05	2005-06	2006-07
Planned Spending	-	-	-
# FTEs	0.5	-	-

Objective: Work with the National Research Council (NRC) to create a framework of policy and process in which to evaluate "Big Science" proposals (i.e., proposals involving funds in the tens or hundreds of millions of dollars).

First Milestone: Put in place a comprehensive framework to address the issue of Canada's involvement in Big Science projects within the overall context of Canadian science and technology by the end of 2004-05.

Rationale: Canada does not currently have a policy framework in which to evaluate very large, multi-year, world-class scientific projects and proposals, and to fund them through their entire life cycle (i.e., concept, capital, operating costs, and decommissioning as appropriate). The Government of Canada must ensure that the value returned by Canada's investments in such projects is maximized and that the decision-making process is as transparent and credible as possible.

Features: A tool for planning and evaluating all aspects of a Big Science proposal, and to compare the merits of various proposals against one another. The established framework may be applied, and the proposal subjected to international scientific peer review, as a crucial step in the Government of Canada's decision to fund such significant undertakings.

Centres for Research in Youth, Science, Teaching and Learning

	2004-05	2005-06	2006-07
Planned Spending	\$1.0M	\$1.0M	\$1.0M
# FTEs	1	0.5	0.5

Objective: Improve the quality and impact of science and math teaching and learning in Canadian schools, and help develop a science culture in Canada.

First Milestone: Establish a national competition in 2004-05 to select and support research centres that will conduct collaborative research involving experts in education and in the NSE, and to foster the transfer of knowledge arising from such collaborations to active partners in the education system.

- Estimated number of awards in 2004-05: 5 or 6
- Estimated value of awards: Up to \$200,000 per year for five years

Rationale: According to the Third International Mathematics and Science Study (TIMSS), less than one quarter of Canadian students have math teachers who have a math or science background, and only one half of Canadian students have science teachers with a math or science background. By contrast, in the United States both figures are above 60 percent and in the rest of the world are greater than 80 percent. Kindergarten to grade 12 education has significant impacts both on NSERC's client communities and on Canada's Innovation Strategy. NSERC's national presence in this area will give a higher profile to current challenges in early science, mathematics, and engineering education in Canada.

Features: These centres will be hosted by faculties of education in universities and will involve collaboration between researchers in education and those in the NSE, as well as colleges, schools, and NGOs involved in science and mathematics education. Provincial education ministers are very supportive of NSERC being involved in this way.

Applicants will have the opportunity to request special funding to expand and extend the work of the research centre to address specific needs of First Nations' communities in their region.

NSERC Regional Offices

	2004-05	2005-06	2006-07
Planned Spending¹	\$1.0M	\$2.0M	\$2.5M
# FTEs	8-10	14-18	17-22

1. Regional office operating budget will be supported through the administrative portion of NSERC's budget.

Objective: Establish NSERC regional offices to increase interaction between NSERC and its regional partners, and to foster a better understanding of, and responsiveness to, regional and local needs.

First Milestone: Open two regional offices in 2004-05: one in Atlantic Canada (Moncton), and one in the Prairies (Winnipeg). Offices in other regions will be announced at a later date.

Rationale: Many initiatives in NSERC's Vision would benefit greatly from NSERC staff being closer to its partner institutions and their local communities. The regional offices will have an important role in listening to and understanding local needs and concerns, and will enable NSERC to evolve from a centrally-located federal agency to a national agency more responsive to the diverse needs of Canada's regions.

Features: The main roles and activities anticipated for staff in regional offices include:

- improving communication in both directions and gathering local information;
- helping to deliver and monitor the new programs for building capacity, college innovation, and science and math education;
- facilitating participation in programs (e.g., increase awareness of university-industry partnership programs, act as link to technology transfer offices, colleges, and others);
- acting as ambassadors for NSERC with local stakeholders and supporting and complementing the work of NSERC's network of representatives at each university;
- acting as focal points for local or region-specific initiatives;
- acting as a liaison between sectors (universities, colleges, industry, and government).

The regional offices will also have the staff and budgets necessary to enable them to make decisions and to take prompt local action.

4.4 Clients and Partners

NSERC does not conduct any research in-house, nor does it have any training facilities. Thus, the universities, colleges, companies, government agencies, and other institutions with which NSERC collaborates are all key co-delivery partners. Most Canadian universities benefit from NSERC programs; similarly, a growing number of industries and government departments participate in these programs, and provide funds and other resources to partnerships formed with university researchers.

Figure 7 presents details on NSERC's client communities, including estimates of the share of eligible individuals and organisations funded by or participating in NSERC's programs.

Figure 7: NSERC's Clients and Partners, 2002-03

	Number Supported or Participating	Share of the Eligible Population ¹	Trends in Share of the Population Over Past 10 Years
Clients:			
University Professors	9,674	75%	Moderate Increase
Undergraduate Students	7,583	7%	Small Increase
Master's/Doctoral Students	8,277	40%	Small Increase
Postdoctoral Fellows	1,865	40% - 45%	Small Increase
University Technicians and Research Professionals	3,196	30% - 40%	Stable
Partner Organisations:			
Universities and Colleges	67	75% ³	Stable
Companies Performing R&D ²	757	10%	Moderate Increase
Federal Science Departments/Agencies ²	16	75%	Moderate Increase
Provincial Science Departments/Agencies ²	18	25% - 40%	Moderate Increase

Source: NSERC

1. The percentage that NSERC supports of all individuals and organisations eligible for NSERC funding.

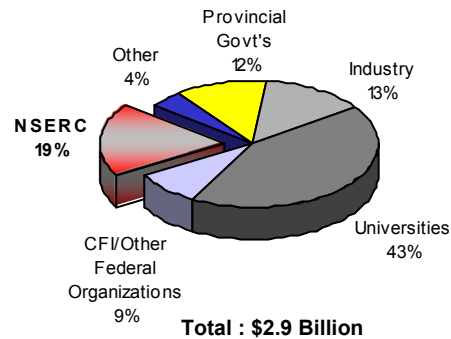
2. Organisations in partnership with NSERC (across all NSERC programs).

3. Percentage only applies for universities.

Universities and Colleges

NSERC is one of the most important sources of funding for R&D in the NSE in Canadian universities. In 2002, \$2.9 billion in R&D was carried out by Canadian universities in the NSE. NSERC directly provided almost one sixth of the total funding. Since much of the other funding from universities, industries and governments is leveraged by NSERC funding, a reasonable estimate makes NSERC directly and indirectly responsible for slightly less than half of the funding. Figure 8 gives a breakdown of the total funding by direct source.

Figure 8: University R&D Funding in the Natural Sciences and Engineering, 2002



Source : Statistics Canada

More than 9,600 university professors and more than 17,500 university students and postdoctoral fellows are supported by NSERC, as well as more than 3,100 university technicians and research associates.

NSERC has expanded its eligibility guidelines to include colleges. Researchers from colleges that are declared eligible by NSERC can participate in NSERC's project-based research programs as co-applicants with university professors. As of April 2004, seven colleges in Canada have been declared eligible. They are: the British Columbia Institute of Technology, New Brunswick Community College at Bathurst, Nova Scotia Community College - Annapolis Valley Campus, Olds College in Alberta, le Cégep de La Pocatière, le Collège de Maisonneuve, le Cégep de Rimouski, and le Cégep de Lévis-Lauzon in Québec.

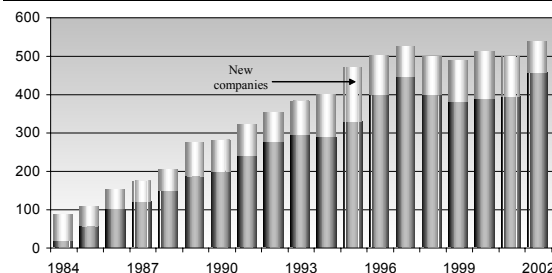
In addition, NSERC is undertaking a pilot program that will fund colleges in order to help foster innovation within the communities they serve. For more details on this pilot project, refer to [Section 4.3](#).

Companies

Since the inception of the university-industry research programs, more than 1,500 firms have participated, rising from less than 50 companies in 1983 to more than 530 businesses in 2003. On average, 100 new firms are working with NSERC every year.

NSERC is well known to companies heavily involved in R&D. In 2002, 24 of the top 50 Canadian R&D companies (as ranked by Research Infosource, 2003) have funded university research jointly with NSERC.

Figure 9: Number of Companies Contributing to NSERC's University-Industry Programs



Source: NSERC

Government Departments/Agencies

NSERC is also well known to most federal and provincial science-based departments and agencies. A list of federal and provincial departments and agencies that collaborated with NSERC in 2002-03 is presented in Figure 10.

Figure 10: NSERC's Federal/Provincial Partners, 2002-03

<i>Federal Departments/Agencies</i>	<i>Provincial Departments/Agencies</i>
Atlantic Canada Opportunities Agency	Alberta Energy
Agriculture and Agri-Food Canada	Alberta Environment
Canada Economic Development for Québec Regions	Alberta Innovation and Science
Canada Mortgage and Housing Corporation	Alberta Science and Research Authority
Canadian Heritage	Alberta Research Council
Canadian Institutes of Health Research	Alberta Transportation
Canadian Space Agency	B.C. Ministry of Agric., Food and Fisheries
Environment Canada	B.C. Ministry of Forests
Fisheries and Oceans Canada	B.C. Ministry of Water, Lands and Air Protection
Health Canada	B.C. Ministry of Sustainable Resource Management
Indian and Northern Affairs Canada	Centre de recherche industrielle du Québec
National Defence	Fonds de recherche sur la nature et les technologies (Québec)
National Research Council Canada	Manitoba Conservation
Natural Resources Canada	Ministry of Economic and Regional Development (Québec)
Public Works and Government Services Canada	Ministry of Environment (Québec)
Social Sciences and Humanities Research Council of Canada	Ministry of Natural Resources (Québec)
Transport Canada	Ministry of Transportation (Québec)
	Ontario Ministry of Agriculture and Food
	Saskatchewan Agriculture, Food and Rural Revitalization

4.5 Monitoring of Results

NSERC measures its performance by evaluating its programs of research and training support, their impact, cost effectiveness, and continuing relevance. When reviewing the performance of support for research and scholarship programs, it is important to remember that these investments take longer to realize objectives than most other government investments. Concrete data can be provided on advanced degrees granted, theses published, patents applied for and granted, papers published, etc., but the long-term socio-economic benefits of NSERC's support of research and training emerge much more slowly.

The impact of NSERC investments is more fully detailed in the [2002-03 Departmental Performance Report](#)²⁷ through a suite of indicators that range from bibliometrics, to patents and licences, to first-generation start-up companies, to new products and processes, as well as the career progression of NSERC-funded students and fellows.

Two key figures from this report are reproduced in Annex B. The first is a logic model outlining NSERC's activities and outputs as well as immediate, intermediate, and strategic outcomes. The second table relates all outcomes to NSERC's major programs. This information serves as a framework when NSERC undertakes program evaluations.

NSERC is committed to ensuring that federal funding supports true research excellence. To this end, NSERC will develop a more comprehensive system to track, evaluate and report on the outputs of the research it funds. This will improve accountability for federal support of university research and contribute to the high standards of excellence for which researchers strive.

Performance and Evaluation

NSERC continues to develop a robust performance measurement strategy that includes the collection of both qualitative and quantitative information on an ongoing basis, as well as periodic reviews and evaluations of major programs, policies or new initiatives. NSERC publishes these [reviews and evaluations](#)²⁸ on its web site along with NSERC management's response, which details actions NSERC will take to address any issues raised in the report.

In order to measure and report on the results of its programs, NSERC will integrate appropriate performance measurement systems into its business practices. NSERC is in the process of developing an agency-wide Results-based Management and Accountability Framework (RMAF). The RMAF will highlight the activities involved in delivering NSERC programs, the outputs that are produced through these activities, and the expected outcomes that will occur as a result of NSERC programs. These are summarized in the NSERC-wide logic model (Annex B), taken from the [2002-03 Departmental Performance Report](#).²⁹ This logic model will form the basis of the RMAF; specific performance indicators will be developed to monitor the achievement of the outcomes identified in the logic model. In addition to the performance measurement strategy, the RMAF will also include a detailed evaluation strategy as well as a plan for reporting on outcomes.

It is expected that the NSERC RMAF will integrate existing performance measurement and evaluation activities with emerging performance indicators and issues. Ongoing commitments to performance measurement include: data collection of a broad range of indicators, special studies and evaluations of programs, policies or new initiatives, and a number of management and monitoring initiatives to ensure the continued quality and relevance of NSERC activities.

²⁷ http://www.nserc.gc.ca/about/PIR/dpr03_toc_e.htm

²⁸ <http://www.nserc.gc.ca/publicat.htm>

²⁹ http://www.nserc.gc.ca/about/PIR/dpr03_toc_e.htm

Audit

NSERC also regularly addresses performance issues in both its program and administration activity, including quality service initiatives, through a rigorous internal audit process. The goal of NSERC's administration activity is to support and underpin the agency's sole business line; performance issues therefore revolve around efficient and quality service to both NSERC's staff and clients (i.e. the NSE research community, industrial partners, and university administrators).

NSERC's internal audit team has developed a long-term audit plan (2003-08) to ensure that key NSERC systems and processes are regularly reviewed and re-validated, and that administrative services are efficient, effective, and accountable. Flexibility will be maintained in these activities to enable NSERC to respond to any situation requiring immediate attention or to additional requirements as defined by central agencies or the Office of the Auditor General.

NSERC publishes [internal audits](#)³⁰ on its web site along with NSERC management's response to each audit, which details actions NSERC will take to address the issues raised by the specific audit.

Monitoring of Client Institutions

NSERC conducts monitoring activities at institutions receiving NSERC funding to ensure that they have appropriate control frameworks in place.

4.6 Government-Wide Initiatives

Modern Comptrollership

As part of the government-wide Modern Comptrollership (MC) initiative, NSERC conducted an [assessment](#)³¹ of its management practices during the winter of 2003 under the banner of Integrated Management Practices. Based on the results and on consultations with managers and staff, an Action Plan was approved by the Management Committee in November 2003 and is now being implemented.

The Action Plan focuses on five priority areas: planning, training, staff performance evaluations, lateral communications and service improvement/client satisfaction. These priorities were selected because: they regroup a significant portion of the improvement opportunities that were identified during the assessment; they address several important elements of the modern comptrollership framework; and they fit well with the current needs, priorities and directions of NSERC. Eighteen projects of varying scope and length were developed under these priorities.

As anticipated in last year's Report on Plans and Priorities, sharing the Modern Comptrollership Project Office between NSERC and SSHRC is resulting in significant

³⁰ <http://www.nserc.gc.ca/publicat.htm>

³¹ http://www.nserc.gc.ca/pubs/int_man_e.htm

synergies between the Action Plans of both agencies. As well, specific activities in the area of service improvement are being integrated in the MC Action Plan.

Specific actions and objectives are spelled out for each project in the [Action Plan](#)³². Milestones in the Action Plan are spread over the next three years.

Government On-line

NSERC continues to develop on-line systems as part of Canada's Government On-Line initiative. NSERC's goal is to provide clients with the ability to easily access relevant NSERC information on-line, and to interact with their collaborators, universities, and NSERC to conduct NSERC-related business electronically.

An example of NSERC's success in this initiative is the increasing usage of the on-line application submission system. In the 2003 Discovery Grants competition – the first implementation of on-line submission – approximately 20 percent of applicants submitted their applications on-line. In the 2004 competition, this figure is 60 percent.

In 2004-05, NSERC will continue to refine its on-line system. Some key projects in the upcoming year include:

- Harmonizing technologies to allow the transfer of information from the [Canadian Common Curriculum Vitae \(CCV\)](#).³³ This year, NSERC will chair the multi-agency CCV Management Committee.
- In conjunction with SSHRC and CIHR, implementing the Financial Data Submission and Reconciliation system to allow universities to easily transfer required financial information to NSERC.
- Implementing the automatic transfer of information between the on-line system and internal systems to improve the quality of application processing and to expand secure on-line sharing capabilities.
- Piloting the Advanced Scoring System on-line collaboration tool for Selection Committee members. This secure system will allow the electronic collection of preliminary application ratings from reviewers, improving the efficiency of the committee's deliberations and reducing members' workloads.
- Continuing the NSERC Web Site Rejuvenation project to increase users' ability to access required information and on-line services easily and efficiently.

NSERC has gained valuable experience in the delivery of these on-line systems and continues to improve its service capabilities in relation to this initiative. Close ties are being maintained with the university community and mechanisms to facilitate accessibility to NSERC staff have been expanded. For example, the NSERC web site's [Contact Us](#)³⁴ page has been improved and the support helpdesk team structure has been expanded to better service clients' needs.

³² <http://www.nserc.gc.ca/publicat.htm>

³³ <http://www.commoncv.net/>

³⁴ http://www.nserc.gc.ca/staff/contact_e.asp

NSERC Collaborations with Federal Departments and Agencies

NSERC has strong ties to many federal departments and agencies, and works with these organisations through joint funding initiatives, memoranda of understanding, and by maintaining lines of communication with relevant contacts in these organisations to ensure NSERC is well-positioned to take advantage of opportunities for collaboration.

For example, NSERC's Research Partnership Agreements program aims to build strong linkages between the private sector, researchers in universities, and federal institutes, and to create synergy among the partners. Certain other partnerships programs also encourage collaboration between university researchers, industry, and government researchers.

NSERC maintains particularly close links with the other two granting agencies, SSHRC and CIHR. The [Memorandum of Understanding](#)³⁵ developed by these agencies and ratified by institutions eligible to receive research and scholarship funding has produced Tri-Council Policy Statements on issues such as [Integrity in Research and Scholarship](#)³⁶ and [Ethical Conduct for Research Involving Humans](#).³⁷

5. Organisation

5.1 *Strategic Outcome and Business Line*

NSERC's sole business line is:

- Support of research and scholarship in the natural sciences and engineering.

The strategic outcome of this business line is:

- To provide Canadians with economic and social benefits arising from the provision of a highly skilled workforce, knowledge transfer of Canadian discoveries in the natural sciences and engineering from universities and colleges to other sectors, and informed access to research results from around the world.

All of NSERC's net planned spending of \$849.6 million for 2004-05 is dedicated to NSERC's sole business line and its strategic outcome. This includes \$36.7 million for administration (less than five percent of NSERC's total budget).

³⁵ http://www.nserc.ca/institution/mou_e.htm

³⁶ http://www.nserc.gc.ca/professors_e.asp?nav=profnave&lbi=p9

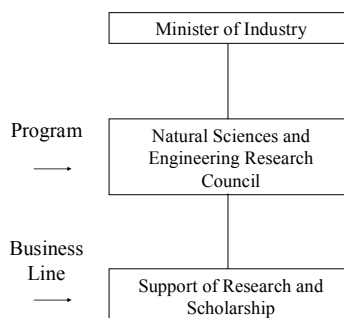
³⁷ http://www.nserc.gc.ca/institution/mou_sch2_e.htm

5.2 Roles, Responsibilities, and Accountability

Organisation Structure

NSERC is a separate employer of the Government of Canada, reporting to Parliament through the Minister of Industry. Figure 11 presents NSERC's organisation structure.

Figure 11: Organization Structure



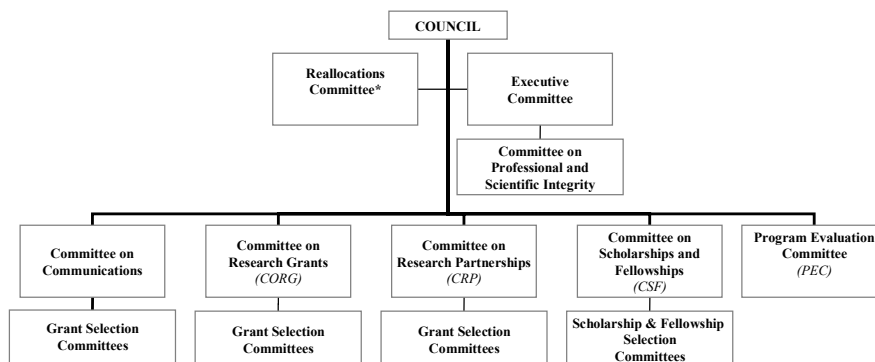
Council and Committee Structure

NSERC is governed by a Council whose 22 members are drawn from universities as well as from the private and public sectors, and appointed by the Governor-in-Council. Members serve part-time and receive no remuneration for their participation. NSERC's President serves full-time and functions as the Chair of the Council and the Chief Executive Officer.

One key function of Council is to review and approve NSERC's Operational Plan which allocates NSERC's budget among its various programs. This plan is prepared by NSERC staff in consultation with stakeholder groups and takes into account priorities identified by the Government of Canada. Council is also advised on policy and programming matters by several standing committees that are also tasked with the continued monitoring of the almost 80 Selection Committees that make specific funding recommendations. For all committees, the membership comprises a range of experts in the fields of NSE and may include university researchers, governmental scientific experts, industrial researchers and entrepreneurs from all regions of Canada and across the world.

All committee participation is done on a volunteer basis, and NSERC appreciates the tremendous support the NSE community provides through both their participation on committees and through the external reviewer process – the other key component of NSERC's peer-review process.

Figure 12: NSERC's Committee Structure



* Not a permanent committee, functions in connection with the reallocations process.

Peer Review

Each year, NSERC sends over 13,600 requests to experts in all disciplines, throughout Canada and the rest of the world, in order to receive impartial, expert assessments of submitted proposals. A typical grant application will be sent to between three and five reviewers, whose comments are an important part of the Selection Committee deliberation process.

NSERC values the volunteer efforts of external reviewers and is working to facilitate the process by further developing on-line services that allow reviewers to securely submit their assessments, and initiatives aimed at ensuring the most well-known researchers are not over-burdened by a flood of requests to review applications.

NSERC Administrative Structure

NSERC's administrative structure is based on three program-delivery divisions: Scholarships and Fellowships, Research Grants, and Research Partnerships. Within these divisions, administrative staff are grouped by discipline, sector, and/or program, and interact with and support the function of NSERC's volunteer Selection Committees.

In addition to these three divisions, a number of support divisions including Council Secretariat, Communications, Policy and International Relations, and eBusiness provide services to all divisions.

NSERC and SSHRC share a Common Administrative Services Directorate which is responsible for the Finance, Facilities, Security, Human Resources, and Information Services aspects of both NSERC and SSHRC. This structure maximizes the efficiency of both agencies' administrative requirements and is one of the reasons that NSERC is able to maintain its administration budget at less than five percent of total planned spending.

5.3 NSERC Planned Spending

The 2004-05 Net Planned Spending for NSERC is \$849.6 million, a net increase of \$90.1 million compared to the 2003-04 Net Planned Spending.

The major spending trends are as follows:

- \$41.0 million increase in flow-through funding to the Canada Research Chairs program.³⁸
- \$39.0 million increase to NSERC's annual budget as announced in Budget 2004.
- \$8.7 million increase to implement NSERC's portion of the CGS program.

NSERC will also adjust allocations within its existing budget to address identified funding priorities. Two of the largest such adjustments are:

³⁸ The Canada Research Chairs program was scheduled to receive a \$27M increase to reach its final annual allocation; however, the 2003-04 budget was also reduced \$14M due to lapsed funding within the program.

- \$15.5 million to fund first-time applicants to the Discovery Grants program, NSERC's number one funding priority.
- \$4.4 million increase in funding to the Canadian Light Source facility from the NSERC MFA budget.

Further details on NSERC's planned spending may be found in Table 1 below.

Table 1: Planned Spending

(\$ millions)	Forecast Spending 2003-04 ¹	Planned Spending 2004-05	Planned Spending 2005-06	Planned Spending 2006-07
Budgetary Main Estimates (gross)	708.1	810.6	819.4	824.4
Non-Budgetary Main Estimates (gross)				
Less: Respendable revenue				
Total Main Estimates	708.1	810.6	819.4	824.4
Adjustments ²				
Canada Graduate Scholarships	7.5	-	-	-
Strengthening Research & Innovation ³	40.9	-	-	-
Operational Budget Carry-forward from 2002-03	0.7	-	-	-
Comptrollership Modernization Initiative	0.1	-	-	-
Terms and Conditions of Employment	0.4	-	-	-
Climate Change - Technology & Innovation	0.2	-	-	-
Canadian Light Source Project	1.3	-	-	-
Audit & Evaluation	0.3	-	-	-
Budget 2004 Increase	-	39.0	39.0	39.0
Total Adjustments	51.4	39.0	39.0	39.0
Net Planned Spending	759.5	849.6	858.4	863.4
Less: Non-respendable revenue				
Refunds of previous years' expenditures	0.7	0.7	0.7	0.7
Plus: Cost of Services received without charge	3.0	3.0	3.0	3.0
Net cost of Program	761.8	851.9	860.7	865.7
Full Time Equivalents	295	308	308	308

1 Reflects the best forecast of total net planned spending to the end of the fiscal year.

2 Adjustments are to accommodate approvals obtained since the Main Estimates and include Budget initiatives, Supplementary Estimates, etc.

3 Reflects \$54.9M increase from Budget 2003 minus \$14.0M in funds clawed back from the Canada Research Chairs program.

Annex A: Financial Information

Tables 2, 3, and 4 present the required financial information for NSERC. Further details on planned expenditures in terms of NSERC's priorities can be found in Figures 3, 4, and 6 in [Section 4.2](#).

Table 2: Summary of Transfer Payments

(\$ millions)	Forecast Spending 2003-04 ¹	Planned Spending 2004-05	Planned Spending 2005-06	Planned Spending 2006-07
Grants				
Support of Research and Scholarship	710.3	792.0	792.0	791.1
Perimeter Institute	5.0	5.0	5.0	5.0
Canada Graduate Scholarships	7.2	15.9	24.9	31.5
Total grants	722.5	812.9	821.9	827.6
Contributions	-	-	-	-
Other Transfer Payments	-	-	-	-
Total Grants, Contributions And Other Transfer Payments	722.5	812.9	821.9	827.6

¹ Reflects the best forecast of total net planned spending to the end of the fiscal year.

Table 3: Source of Non-Respendable Revenue

Non-Respendable Revenue (\$ millions)	Forecast Revenue 2003-04 ¹	Planned Revenue 2004-05	Planned Revenue 2005-06	Planned Revenue 2006-07
Natural Sciences and Engineering Research Council				
Support of Research and Scholarship				
Refunds of previous years' expenditures	0.7	0.7	0.7	0.7
Total of Non-respendable Revenue	0.7	0.7	0.7	0.7

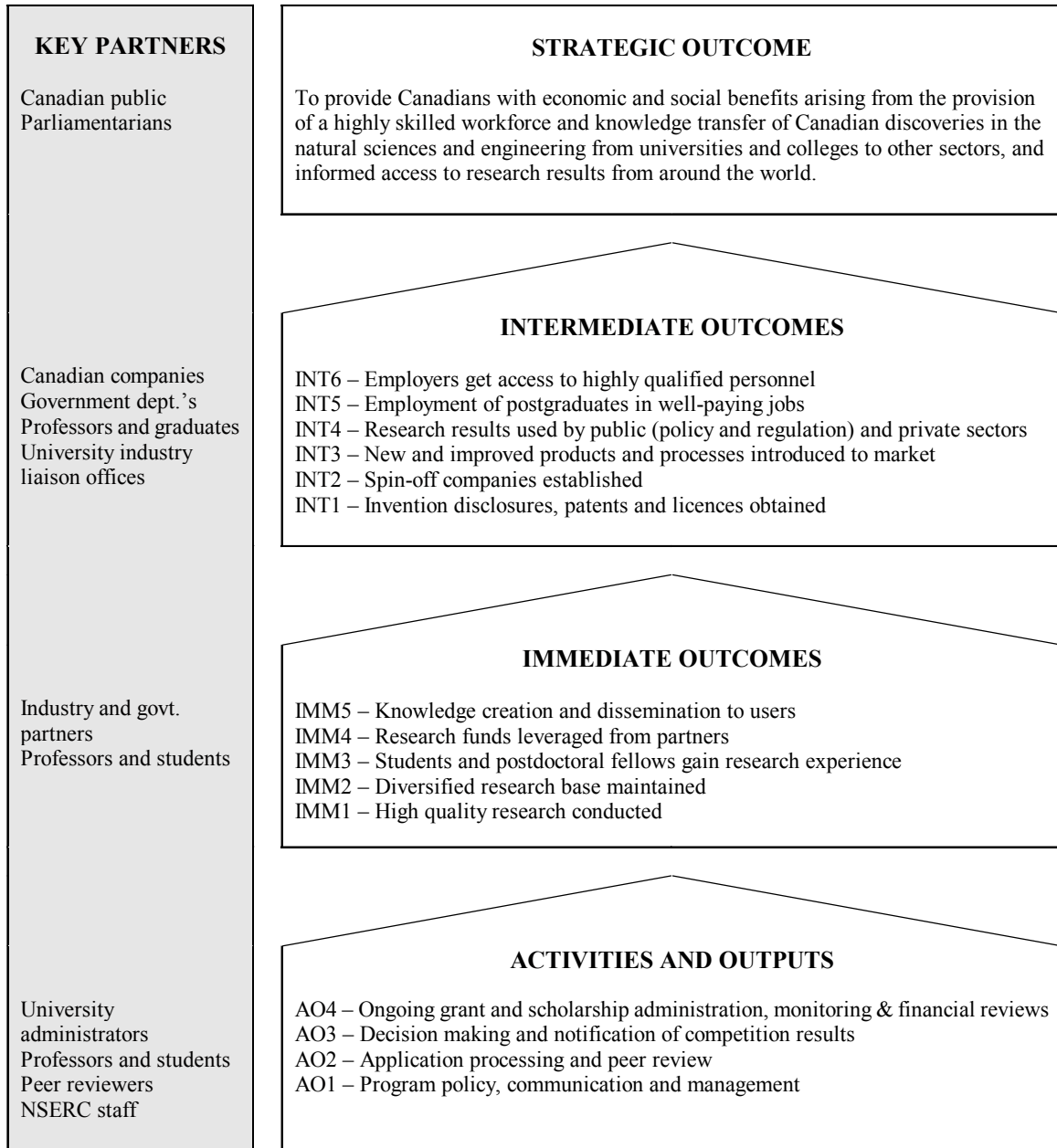
¹ Reflects the best forecast of total net planned spending to the end of the fiscal year.

Table 4: Net Cost of Program for 2004-2005

(\$ millions)	Natural Sciences and Engineering Research Council Program Total
Planned Spending (Budgetary and Non-budgetary Main Estimates plus adjustments)	849.6
Plus: <i>Services Received without Charge</i>	
■ Accommodation provided by Public Works and Government Services Canada (PWGSC)	1.5
■ Contributions covering employer's share of employees' insurance premiums and expenditures paid by Treasury Board Secretariat	1.5
■ Worker's compensation coverage provided by Human Resources Development Canada	-
■ Salary and associated expenditures of legal services provided by Justice Canada	-
	<hr/> 3.0
Less: Non-Respendable Revenue	0.7
	<hr/> 0.7
2004-2005 Net cost of Program	851.9

Annex B: NSERC Logic Model and Planned Outcomes by Major Program

NSERC Performance Logic Model



Major NSERC Programs

KEY OUTCOMES	MAJOR PROGRAMS AND OBJECTIVES	RESOURCES 2004-05 (\$M)
IMM1-3, IMM5, INT1-6	<p>Discovery Grants</p> <p>The Discovery Grants program is NSERC's largest single program, and it is the mainstay of support for university-based research. The program provides partial funding for ongoing multi-year programs of basic research, usually to an individual principal investigator.</p> <p>The objectives of the Discovery Grants program are to: assist in promoting and maintaining a diversified base of high-quality research capability in natural sciences and engineering in Canadian universities; foster research excellence; and provide a stimulating environment for research training.</p>	\$283.7
IMM3, INT5-6	<p>Postgraduate and Canada Graduate Scholarships</p> <p>Postgraduate Scholarships and Canada Graduate Scholarships are intended to assist in the training of highly qualified scientists and engineers by providing financial support to excellent students working towards a master's or doctoral degree in the natural sciences or engineering.</p>	\$75.2
IMM1, IMM3-5 INT1-6	<p>Strategic Project Grants</p> <p>This program funds project research in target areas of national importance and in emerging areas that are of potential significance to Canada. The research is early stage with the potential to lead to breakthrough discoveries.</p>	\$47.9
IMM1, IMM 3-5 INT1-6	<p>Networks of Centres of Excellence</p> <p>Networks of Centres of Excellence are unique partnerships among universities, industry, government and non-governmental organisations aimed at turning Canadian research and entrepreneurial talent into economic and social benefits for all Canadians. An integral part of the federal government's Innovation Strategy, these nation-wide, multidisciplinary and multi-sectoral research partnerships connect excellent research with industrial know-how and strategic investment.</p>	\$38.2
IMM1, IMM 3-5 INT1-6	<p>Collaborative Research and Development Grants</p> <p>The program is intended to give companies operating from a Canadian base access to the special knowledge, expertise and educational resources at Canadian postsecondary institutions and to offer opportunities for mutually beneficial collaborations that result in industrial or economic benefits to Canada. CRD grants support well-defined projects undertaken by university researchers and their private-sector partners.</p>	\$33.8
IMM1-5 INT1-4	<p>Research Chairs</p> <p>NSERC Industrial Research Chairs are intended to: assist universities in building on existing strengths to achieve the critical mass required for a major research endeavour in science and engineering of interest to industry; and/or assist in the development of research efforts in fields that have not yet been developed in Canadian universities, but for which there is an important industrial need.</p> <p>The key objective of the Canada Research Chairs program is to enable Canadian universities, together with their affiliated research institutes and hospitals, to achieve the highest levels of research excellence, to become world-class research centres in the global, knowledge-based economy.</p>	<p>\$17.1</p> <p>\$133.2</p>

Major NSERC Programs

KEY OUTCOMES	MAJOR PROGRAMS AND OBJECTIVES	RESOURCES 2004-05 (\$M)
IMM3, INT5-6	<p>Postdoctoral and Industrial Fellowships</p> <p>These fellowships provide support to a core of the most promising researchers at a pivotal time in their careers. The fellowships are also intended to secure a supply of highly qualified Canadians with leading-edge scientific and research skills for Canadian industry, government, and universities.</p>	\$19.0
IMM3	<p>Undergraduate Student Research Awards</p> <p>These undergraduate awards are meant to stimulate students' interest in research in the natural sciences and engineering. They are also meant to encourage students to undertake graduate studies and pursue a research career in these fields.</p>	\$19.2
IMM1-3, IMM5, INT1-6	<p>Research Tools and Instruments and Major Facilities Access Grants</p> <p>Research Tools and Instruments grants foster and enhance the research and research training capability of university professors, by supporting the purchase of research equipment and installations.</p> <p>Major Facilities Access Grants support researchers' access to major regional or national research facilities by assisting these facilities to remain in a state of readiness for researchers to use.</p>	\$22.0
IMM1, IMM 3-5 INT1-6	<p>Research Networks</p> <p>The objective of the Research Networks grants program is to foster: the creation of knowledge and expertise that can most effectively be attained through large-scale multidisciplinary research projects; collaboration between university- and college-based researchers and other sectors; the transfer of knowledge and expertise to Canadian-based organisations; and training of highly qualified personnel.</p>	\$18.0

Annex C: Contact Information

Contact for Further Information and Web Site

Our web site is located at <http://www.nserc.gc.ca>.

A searchable web-based database of grants and scholarships awarded by NSERC since 1991 is located at <http://www.nserc.gc.ca/programs/result/database.htm>.

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