

**Natural Sciences and Engineering Research
Council of Canada**

**2009-10
Estimates**

Report on Plans and Priorities

Minister of Industry

Canada

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Section I – Overview of the Agency

Minister's Message

As Minister of Industry, I am committed to the long-term competitiveness and prosperity of our country. Canada has many economic advantages upon which we must continue to build if we are to set the right conditions for our long-term success. With this in mind, Industry Canada and its Portfolio partners are striving toward the development of an innovative economy with robust sectors and an efficient and competitive marketplace.



Our priorities remain aligned with Advantage Canada, the government's long-term economic plan. Here, we set out clear objectives, including the reduction of taxes, the encouragement of entrepreneurship, and the development of a knowledge-based economy.

In the 2009–2010 Report on Plans and Priorities, we recognize that as we look to the year ahead we are entering a period of continued global economic uncertainty, one that demands clear and strategic action on the part of the government to ensure we accomplish the long-term goals we have set for ourselves. Our departmental priorities and initiatives will be guided by a balanced consideration of the demands of the global economic situation and our long-term vision for Canada's growth and prosperity.

In Budget 2009 — Canada's Economic Action Plan, the government has developed a clear and comprehensive response to the slowdown in the global economy, which is in keeping with the continuing objectives of Advantage Canada. The economic action plan addresses short-term realities, while setting in place the conditions to strengthen Canada's economy for generations to come.

Industry Canada and its Portfolio partners are at the heart of the government's strategy to stimulate the Canadian economy. We are taking steps to improve the competitiveness of Canada's traditional economy by providing short-term support for key sectors such as the auto industry. We are ensuring that all regions of Canada prosper by supporting economic diversification. We are fostering small businesses by improving access to credit and encouraging growth through tax reductions and incentives. We are supporting measures to develop a highly skilled workforce through such means as expanding the Canada Graduate Scholarships program. At this time of intense international competition for the world's best and brightest, government support is helping to attract and retain these individuals in Canada. We are positioning Canada as a leader in the global knowledge economy.

In the ongoing pursuit of our mandate, we will continue to focus on innovation as a means to develop a globally competitive economy. Our ultimate goal is to help Canadians continue to enjoy a quality of life that is envied throughout the world.

It is my pleasure to present this year's Report on Plans and Priorities for Industry Canada and its Portfolio partners, which will outline in greater detail the priorities and pursuits in which we will be engaged in the year to come.

Tony Clement
Minister of Industry

Management Representation Statement

I submit for tabling in Parliament, the 2009-10 Report on Plans and Priorities (RPP) for the Natural Sciences and Engineering Research Council (NSERC).

This document which has been prepared based on the reporting principles contained in the *Guide to the Preparation of Part III of the Estimates – Reports Tabled in Parliament in 2009* :

- adheres to the specific reporting requirements outlined in the Treasury Board of Canada Secretariat guidance;
- is based on the agency's strategic outcomes and Program Activity Architecture that were approved by the Treasury Board;
- presents consistent, comprehensive, balanced and reliable information;
- provides a basis of accountability for the results achieved with the resources and authorities entrusted to it; and
- reports finances based on approved planned spending numbers from the Treasury Board of Canada Secretariat.

Suzanne Fortier
President, NSERC

Raison d'être

The Natural Sciences and Engineering Research Council of Canada ([NSERC](#)) is a key instrument of Canada's federal government to make Canada a country of discoverers and innovators for the benefit of all Canadians. NSERC reaches this vision by investing in people, discovery and innovation through programs that support post-secondary research in the natural sciences and engineering (NSE) based on national peer-reviewed competitions, and through partnerships of universities and colleges with the private sector. NSERC also supports the training of the next generation of talented scientists and engineers.

Responsibilities

NSERC is a departmental corporation of the Government of Canada created in 1978. It is funded directly by Parliament and reports to it through the Minister of Industry. NSERC's [Council](#) is composed of the President and up to 21 other distinguished members selected from the private and public sectors. The elected Vice-President is the Chair of Council and of its Executive Committee. The Council is advised on policy matters by various standing committees. The President of NSERC is the Chief Executive Officer. Funding decisions are approved by the President on the basis of recommendations made by peer review committees.

In 2009-10, NSERC will invest just over \$1 billion in post-secondary research and training in the NSE. NSERC's budget represents 10 per cent of the federal government's expenditures for science and technology (S&T), and 18 per cent of all university research and development (R&D) funding in the NSE.

Mandate

The functions of NSERC, based on the authority and responsibility assigned to it under the *Natural Sciences and Engineering Research Council Act* (1976-1977, c.24), are to:

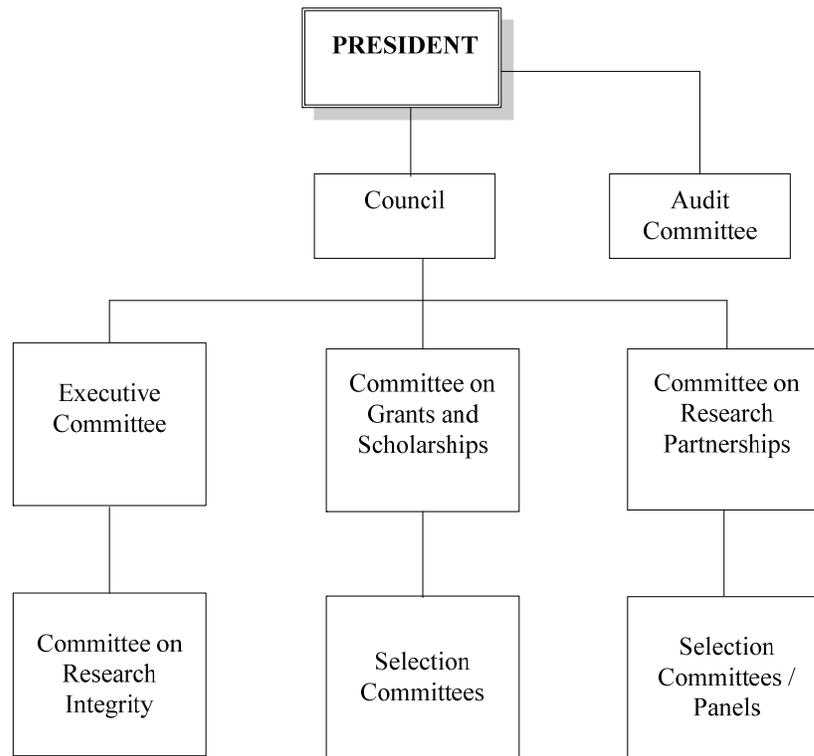
- Promote and assist research in the natural sciences and engineering, other than the health sciences; and
- Advise the Minister in respect of such matters relating to such research as the Minister may refer to the Council for its consideration.

NSERC Quick Facts: 2009-10

- President:** Dr. Suzanne Fortier
Chair: The Honourable James Edwards
Budget: Approximately \$1 billion
Head Office: Ottawa, ON
Regional Offices*:
- Moncton, NB
 - Montreal, QC
 - Winnipeg, MB
 - Vancouver, BC
- Employees:** 357 Full-time Equivalents
Reach:
- 26,500 students and postdoctoral fellows
 - 11,800 university professors
 - 1,400 Canadian companies
 - over 90 universities and colleges

* NSERC plans to open a fifth regional office in Ontario in 2009.

NSERC's Organizational and Governance Structure



Strategic Outcomes

In order to achieve its mandate, NSERC works towards the following strategic outcomes:

- **People: Highly skilled science and engineering professionals in Canada** – *Building our human capital in the natural sciences and engineering by attracting and developing highly skilled science and engineering professionals.*
- **Discovery: High quality Canadian-based competitive research in the natural sciences and engineering** – *Unleashing the power of our researchers to create knowledge and opportunities.*
- **Innovation: Productive use of new knowledge in the natural sciences and engineering** – *Seizing strategic opportunities for our country and realizing the benefits of research in industry and society.*

NSERC's focus on people, discovery and innovation maps directly onto the [Federal S&T Strategy](#) which emphasizes building a People Advantage, a Knowledge Advantage and an Entrepreneurial Advantage for Canada. Virtually all of NSERC's funding relates to these advantages.

Program Activity Architecture

	1.0 People	2.0 Discovery	3.0 Innovation
Strategic Outcomes	Highly skilled science and engineering professionals in Canada	High quality Canadian based competitive research in the natural sciences and engineering	Productive use of new knowledge in the natural sciences and engineering
Activities	1.1 Promote Science and Engineering 1.2 Support Students and Fellows 1.3 Attract and Retain Faculty	2.1 Fund Basic Research 2.2 Support for Research Equipment and Major Resources	3.1 Fund Research in Strategic Areas 3.2 Fund University-Industry-Government Partnerships 3.3 Support Commercialization
Programs	1.1.1 PromoScience 1.1.2 Centres for Research in Youth, Science Teaching and Learning 1.1.3 Prizes 1.2.1 Undergraduate Student Research Awards 1.2.2 NSERC Postgraduate Scholarships 1.2.3 Alexander Graham Bell Canada Graduate Scholarships * 1.2.4 Postdoctoral Fellowships 1.2.5 Industrial Research and Development Fellowships 1.2.6 Industrial Research and Development Internships * 1.2.7 Collaborative Research and Training Experience 1.3.1 Canada Research Chairs * 1.3.2 Industrial Research Chairs 1.3.3 Chairs in Targeted Areas of Research 1.3.4 University Faculty Awards	2.1.1 Discovery Grants 2.1.2 Special Research Opportunity Grants 2.1.3 General Support 2.2.1 Research Tools and Instruments 2.2.2 Major Resources Support Grants 2.2.3 Research Capacity Development in Small Universities	3.1.1 Strategic Partnerships 3.1.2 Collaborative Health Research Projects * 3.2.1 Collaborative Research and Development Grants 3.2.2 Research Partnership Agreements 3.2.3 Networks of Centres of Excellence *+ 3.3.1 Intellectual Property Mobilization * 3.3.2 Idea to Innovation Program 3.3.3 College and Community Innovation Program * 3.3.4 Centres of Excellence for Commercialization and Research *

* Programs involving two or more of the federal research granting agencies (NSERC, Canadian Institutes of Health Research [CIHR], Canada Foundation for Innovation [CFI], Social Sciences and Humanities Research Council [SSHRC])

+ The new Business-Led Networks of Centres of Excellence (BL-NCE) are included in this activity.

Program Activity Architecture Crosswalk

Modifications to NSERC’s Program Activity Architecture (PAA) were approved by the Treasury Board Secretariat in July 2008. Changes reflect recent program evolution and better classify programs according to their primary objective. The updated PAA is consistent with the way NSERC manages its programs and allocates resources to achieve expected results.

Summary of changes:

1. The Industrial Research and Development Internships (IRDI) Program was moved from Program Activity (PA) 3.2 (Fund University-Industry-Government Partnerships) to PA 1.2 (Support Students and Fellows). This amendment better represents the expected result of the IRDI program in which opportunities are created for skilled graduates to gain experience in industry.
2. The Centres of Excellence for Commercialization and Research (CECR) Program was moved from PA 3.2 (Fund University-Industry-Government Partnerships) to PA 3.3 (Support Commercialization). The program’s name and objectives best align with the expected results of PA 3.3: “The transfer of knowledge and technology residing in Canadian universities and colleges to the user sector is facilitated.”

Redistribution of financial resources following modification of PAA

		New Program Activity 2009-10		
		PA 1.2 Support Students and Fellows	PA 3.3 Support Commercialization	Total
	(\$ millions)			
Old Program Activity	PA 3.2 Fund University- Industry- Government Partnerships	\$4.38	\$19.12	\$23.50

Amounts represent the sum of the forecast spending for 2008-09 and the planned investment for the three-year reporting period (2009-12).

Planning Summary¹

Financial Resources (\$ millions)		
2009-10	2010-11	2011-12
\$1,039.88	\$1,022.76	\$1,024.29

Human Resources (Full-Time Equivalent—FTE)		
2009-10	2010-11	2011-12
357	357	357

Strategic Outcome 1.0: People — Highly skilled science and engineering professionals in Canada					
Performance Indicators				Targets	
Total researchers per thousand employed relative to other Organization for Economic Cooperation and Development (OECD) countries				Maintain top 10 world ranking (Canada was 8 th in 2005)	
<u>Program Activity</u> ² (\$millions)	Forecast Spending 2008-09	Planned Spending			<u>Alignment to Government of Canada Outcomes</u>
		2009-10	2010-11	2011-12	
1.1 Promote Science and Engineering	\$6.30	\$6.58	\$5.65	\$5.53	Innovative and Knowledge-based Economy
1.2 Support Students and Fellows	\$157.54	\$152.20	\$155.14	\$158.72	Innovative and Knowledge-based Economy
1.3 Attract and Retain Faculty	\$169.01	\$167.24	\$166.02	\$166.02	Innovative and Knowledge-based Economy
Total Planned Spending for SO 1.0		\$326.02	\$326.81	\$330.27	

¹ This report does not include information from Budget 2009. Budget 2009 information will be included in subsequent reports of the Estimates.

² For program activity descriptions, please access the Main Estimates online at <http://www.tbs-sct.gc.ca/est-pre/estimate.asp>

Strategic Outcome 2.0: Discovery – High quality Canadian-based competitive research in the natural sciences and engineering					
Performance Indicators			Targets		
Average number of times that Canadian papers in the NSE are cited by other researchers (Average Relative Citation factor of Canadian publications in the NSE – comparison with other countries)			Maintain top 10 world ranking (currently Canada is 7 th)		
<u>Program Activity</u> (\$millions)	Forecast Spending 2008-09	Planned Spending			<u>Alignment to Government of Canada Outcomes</u>
		2009-10	2010-11	2011-12	
2.1 Fund Basic Research [‡]	\$380.67	\$366.82	\$364.40	\$360.40	Innovative and Knowledge-based Economy
2.2 Support for Research Equipment and Major Resources	\$54.27	\$46.36	\$44.38	\$46.41	Innovative and Knowledge-based Economy
Total Planned Spending for SO 2.0		\$413.18	\$408.78	\$406.81	

‡ The decrease in planned spending for PA 2.1 is a result of the phasing out of special funding for International Polar Year.

Strategic Outcome 3.0: Innovation – Productive use of new knowledge in the natural sciences and engineering					
Performance Indicators			Targets		
Percentage growth in the number of partner companies annually			Greater than 5%		
<u>Program Activity</u> (\$millions)	Forecast Spending 2008-09	Planned Spending			<u>Alignment to Government of Canada Outcomes</u>
		2009-10	2010-11	2011-12	
3.1 Fund Research in Strategic Areas	\$116.45	\$124.10	\$133.75	\$135.38	Innovative and Knowledge-based Economy
3.2 Fund University-Industry-Government Partnerships	\$131.49	\$109.29	\$105.67	\$104.08	Innovative and Knowledge-based Economy
3.3 Support Commercialization	\$14.38	\$46.38	\$26.84	\$26.84	Innovative and Knowledge-based Economy
Total Planned Spending for SO 3.0		\$279.77	\$266.26	\$266.30	

<u>Program Activity</u> (\$millions)	Forecast Spending 2008-09	Planned Spending			<u>Alignment to Government of Canada Outcomes</u>
		2009-10	2010-11	2011-12	
4.1 Internal Services [‡]	\$0.00	\$25.91	\$25.91	\$25.91	Innovative and Knowledge-based Economy

[‡] Internal Services include activities and resources that apply across NSERC. These do not include activities and resources provided for specific programs. See Section II, Strategic Outcome for Internal Services.

Total Planned Spending		\$1,044.88	\$1,027.76	\$1,029.29	Innovative and Knowledge-based Economy
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Contribution of Priorities to Strategic Outcomes

Operational Priorities			
Priority 1. People Advantage: Inspire new generations of students to pursue careers in science and engineering, and provide them with the means to develop their full potential.			
Type	Ongoing	Link to Strategic Outcomes	1.0 People
<p><u>Why this is a priority</u></p> <ul style="list-style-type: none"> To build the future pipeline of domestic post-secondary students by ensuring that Canadian youth are exposed to activities that capture their imagination and generate curiosity and excitement about science, mathematics and technology; To ensure Canada has a supply of highly qualified personnel (HQP) by supporting university students and fellows during their training in research and by providing them with opportunities to develop additional skills and to experience enriched and varied research environments; and To position Canada as a destination of choice for top foreign students and researchers. <p><u>Plans for meeting the priority</u></p> <ul style="list-style-type: none"> Enable more students to gain research experience in industry while undertaking advanced studies in Canada; (Ongoing with new elements) Launch the Collaborative Research and Training Experience (CREATE) program to encourage collaborative and integrative approaches, address significant scientific challenges associated to Canada's research priorities, and facilitate the transition of new researchers from trainees to productive employees in the Canadian workforce; and (New) Launch the Vanier Canada Graduate Scholarship (CGS) and the CGS Michael Smith Foreign Study Supplements programs and review NSERC's suite of scholarships and fellowship programs to ensure optimal results in relation to the evolving environment. (New) 			
Priority 2. Knowledge Advantage: Fuel the advancement of knowledge in science and engineering and ensure that Canadian scientists and engineers can be leaders and key players in a global knowledge economy.			
Type	Ongoing	Links to Strategic Outcomes	1.0 People 2.0 Discovery

<p><u>Why this is a priority</u></p> <ul style="list-style-type: none"> • To ensure that Canada develops and maintains the people and infrastructure to conduct world-class research in the broad areas of NSE; • To encourage creativity and research at the leading edge of world knowledge; and • To capitalize on benefits arising from Canadians leading or participating in international collaborations. <p><u>Plans for meeting the priority</u></p> <ul style="list-style-type: none"> • Enable new faculty with high research potential to firmly launch their research programs and demonstrate their capabilities as competitive contributors to Canada's research, research training and innovation base; • Expand the Discovery Accelerator Supplement (DAS) program to fund the research activities of established academic scientists/engineers to accelerate progress and maximize impact, particularly in the priority areas identified in the Federal S&T Strategy; and • Adopt peer review structures and processes that ensure flexibility and continuously adapt to the changing research environment following the recommendations of the International Review of the Discovery Grant Program and the Grant Selection Committee Structure Review. (New) 			
<p>Priority 3. Entrepreneurial Advantage: Connect and apply the strength of the academic research system to addressing the opportunities and challenges of building prosperity for Canada.</p>			
Type	Ongoing	Link to Strategic Outcomes	3.0 Innovation
<p><u>Why this is a priority</u></p> <ul style="list-style-type: none"> • To stimulate innovation in the Canadian economy by creating partnerships between the academic research community and the user sector and enabling knowledge and technology transfer; • To address Canadian priorities and challenges by increasing research in targeted areas of strategic importance to Canada and to increase national and international connections in these areas; and • To build prosperity in Canada by helping to create a vibrant knowledge-based economy. <p><u>Plans for meeting the priority</u></p> <ul style="list-style-type: none"> • Implement the industry-driven strategies addressed in Budget 2008 aimed at the following sectors: automotive, manufacturing, forestry, and fisheries; explore means to increase and sustain existing partnerships across all sectors during the current economic situation; (New) • Expand the National Research Council (NRC)-NSERC-Business Development Bank of Canada (BDC) partnership to accelerate commercialization of publicly funded research; • Continue to increase the number of partnerships in priority areas identified in the Federal S&T Strategy: environment, energy, information and communication technology (ICT); • Develop an NSERC Strategy for Partnership and Innovation; (New) • Review NSERC's intellectual property policy to remove any barriers to commercialization of research and to facilitate research agreements; and (New) • Assess the need for a Pre-Collaborative Research and Development (Pre-CRD) grant pilot program to increase the number of university-industry interactions and partnerships. (New) 			

Management Priorities			
Priority 4. Demonstrate NSERC's accountability and how the results of its investments in Canadian research and training benefit Canadians.			
Type	Previously committed to	Links to Strategic Outcomes	1.0 People 2.0 Discovery 3.0 Innovation
<p><u>Why this is a priority</u></p> <ul style="list-style-type: none"> • To demonstrate accountability and stewardship in the management of Canada's investments in S&T; • To increase effectiveness and client service; and • To measure the results and impacts of the government's investments. <p><u>Plans for meeting the priority</u></p> <ul style="list-style-type: none"> • Meet the commitments of the federal S&T Strategy related to governance, accountability and value for money; • Ensure compliance with all new policies and frameworks (i.e. Internal Audit, Evaluation, Management Accountability Framework [MAF]); • Reduce paper-based processes and harmonise business solutions (i.e. Enterprise Award Management System [EAMS] and Canadian Common CV [CCV]); • With the SSHRC and CIHR, develop an action plan to revise the Tri-Council Policy Statement: Integrity in Research and Scholarship (TCPS-I); (New) • With SSHRC and CIHR, finalize, approve and release the second edition of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS-E); (New) • Enhance capacity and stay at the forefront of the field of performance measurement for S&T investments; and • With CIHR, SSHRC and CFI, work to improve reporting and integrated measurement of results and impacts of investments in post-secondary research and advanced training. (New) 			
Priority 5. Increase visibility of Canadian research			
Type	Previously committed to	Links to Strategic Outcomes	1.0 People 2.0 Discovery 3.0 Innovation
<p><u>Why this is a priority</u></p> <ul style="list-style-type: none"> • To spur Canadian public interest in NSE to inspire participation in S&T. <p><u>Plans for meeting the priority</u></p> <ul style="list-style-type: none"> • Develop new outreach mechanisms and tools to target new audiences and demonstrate the benefits and results from Canadian research; and (New) • Increase Canada's awareness of research achievements by leveraging existing relationships with core audiences through the NSERC regional offices, former NSERC Council members, former NSERC prize winners and journalists, to ensure that audiences are reached at national, regional and local levels. (Previously committed to, with new elements) 			

Risk Analysis

NSERC's operational and management priorities are ongoing and are monitored according to NSERC's integrated Results-based Management and Accountability Framework (RMAF) and Risk-based Audit Framework (RBAF). In the development of the RMAF-RBAF, 16 different types of risks were identified and three risks are considered significant. These 3 significant risks which may impact NSERC's plans and priorities over the reporting period are summarized below:

Risk	Mitigation
Ability to remain relevant and make and implement strategic decisions that align with evolving context.	NSERC ensures the relevance of its activities and investments by aligning very closely with the priorities of the Federal S&T Strategy. NSERC actively consults stakeholders through various governance and advisory committees. NSERC conducts surveys and consultations to keep abreast of issues, opportunities and challenges.
Ability to ensure optimal funding decisions and to maintain control and accountability over expenditures.	NSERC funding decisions are informed by a rigorous peer review process to foster excellence and ensure that the research supported is gauged against the highest international standards. The blue-ribbon committee that conducted the International Review of the Discovery Grants Program concluded that the program "is an unusually effective and efficient method of research support, particularly in the Canadian context." NSERC, together with SSHRC and CIHR, have a Memorandum of Understanding with the institutions that administer funds from the federal granting agencies on behalf of researchers, to ensure that the funds entrusted to NSERC are well managed and are used effectively, economically and in the best interest of the research supported by the award.
Ability to ensure integrity in research.	NSERC grant recipients must abide by the <i>Tri-Council Policy Statement: Integrity in Research and Scholarship</i> which provides a formal process to investigate possible breaches of scientific integrity brought to NSERC's attention. NSERC, together with SSHRC and Association of Universities and Colleges of Canada (AUCC), recently conducted a review of this policy framework and process, and identified improvements that can be made. NSERC will be implementing these changes over the coming two years.

In addition, NSERC experiences risk related to the current circumstances that is integral to all of its programs and that could influence the plans, priorities, performance and decision making over the 3-year reporting period. For example, the reduced capacity of Canadian industry to engage in R&D in times of economic uncertainty may compromise NSERC's ability to deliver on partnership programs that require contributions from industrial partners.

While NSERC administers a significant budget, the Council's overall risk level compared to other government entities is considered low, in terms of continuity of government operations and the maintenance of services to, and protection of interests of, the Canadian public. This assessment of risk level is further supported by the [Blue Ribbon Panel report on Grants and Contributions](#) which stated, "The record of performance by the federal research granting agencies, including CFI, has been deemed high by international

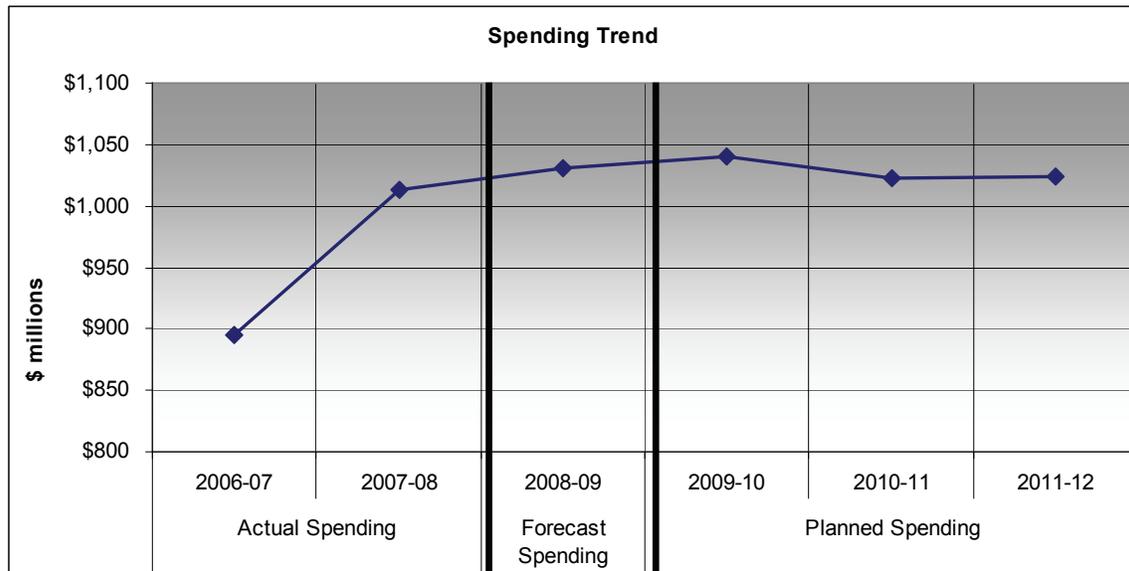
standards. The two councils and CIHR have successfully managed their own research portfolios, using a rigorous system of oversight, including detailed memorandum of understanding signed by all recipient institutions and regular financial monitoring visits of recipient universities."

Expenditure Profile

For the 2009-10 fiscal year, NSERC plans to spend \$1,028.9 million to meet the expected results of its program activities and contribute to its strategic outcomes.

In 2008, NSERC conducted an in-depth review of the funding, relevance and performance of all its programs to ensure results and value for money from programs that are a priority for Canadians. The conclusions of this Strategic Review were submitted to the Treasury Board in autumn 2008. The results of this review will be reflected in future reporting to Parliament.

The figure below illustrates NSERC's spending trend from 2006-07 to 2011-12.



For the 2006-07 to 2007-08 periods, the total spending are the total authorities dispersed as reflected in the Public Accounts. For the 2008-09 period the forecast spending amounts indicated on the graph include all Parliamentary appropriations: Main Estimates, Supplementary Estimates, and carry-forward adjustment. For the 2009-10 to 2011-12 periods, the planned spending includes the figures from the 2009-10 Annual Reference Levels Update (ARLU) plus the anticipated funding being requested via the supplementary estimates.

Since 2006-07, NSERC's core spending has increased primarily due to \$43 million received in [Budget 2007](#), including the \$6 million received for the Canada Graduate Scholarships program, and an additional \$34 million received in Budget 2008.

In addition to these core funding increases NSERC also received non-cumulative funding for the Centres of Excellence for Commercialization and Research (CECR) program in the amounts of \$57.2 million and \$19.1 million for the years 2007-08 and 2008-09, respectively. The Business Led Networks of Centres of Excellence program received non-cumulative funding in the amounts of \$7.0 million in 2008-09, \$7.4 million in 2009-10 and \$8.4 million in 2010-11 and 2011-12.

Voted and Statutory Items Displayed in the Main Estimates

Voted and Statutory Items Displayed in the Main Estimates (\$ millions)			
Vote or Statutory Item	Truncated Vote or Statutory Wording	2009-2010	2008-2009
		Main Estimates	Main Estimates
65	Operating expenditures	\$41.39	\$40.65
70	Grants	\$922.91	\$913.43
(S)	Contributions to employee benefit plans	\$4.10	\$4.13
Total for Agency		\$968.40	\$958.21

NSERC's administration costs are approximately five per cent of its total budget, which is low compared to similar agencies in Canada and around the world. NSERC is able to maintain this low level of overhead expenses by extensively using volunteer committee members and reviewers, obtaining agreement from Canadian universities that receive NSERC funds to participate in their administration, and sharing the costs of common administrative services through a successful partnership with SSHRC.

Section II – Analysis of Program Activities by Strategic Outcome

Strategic Outcome 1.0 – People: Highly skilled science and engineering professionals in Canada

Successfully conducting research and putting new knowledge to work requires a pool of highly qualified people. Universities offer the best training ground for the next generation of researchers – our human capital – whether they ultimately work in industry, in post-secondary education or in the public sector. NSERC’s people-oriented programs promote science and engineering to a diverse audience, support undergraduate, graduate and postgraduate research experience and training, and attract highly qualified faculty to our universities and into industry-university chairs.

Program Activity 1.1 Promote Science and Engineering					
Human Resources (FTEs) and Planned Spending (\$ millions)					
2009-10		2010-11		2011-12	
FTE	Planned Spending	FTE	Planned Spending	FTE	Planned Spending
1	\$6.58	1	\$5.65	1	\$5.53
Program Activity Expected Results		Performance Indicators		Targets	
Student interest in research in the sciences, math and engineering is encouraged.		Percentage of science promotion projects that successfully complete the planned activity		Greater than 80%	
		Number of knowledge transfer activities that target teachers		Greater than 100	

Program Activity Summary: To ensure that Canada has an ongoing supply of future discoverers and innovators, NSERC encourages interest in science and engineering in Canadian youth and in the broader population.

Subactivities include:

- [PromoScience](#)
- [Centres for Research in Youth Science Teaching and Learning \(CRYSTAL\)](#)
- [Prizes](#)

Planning Highlights:

Through **PromoScience** grants, NSERC assists approximately 125 organizations, including museums, science centres, non-government organizations and universities, to promote science and engineering to youth. Program resources are comparatively small and effectively leveraged.

NSERC **prizes** recognize and highlight Canadian achievements in training, research and innovation. Prizes are awarded for example for outstanding achievements by doctoral students and for innovations resulting from university-industry partnerships.

Lessons Learned:

The **Centres for Research in Youth Science Teaching and Learning** program supports university-based research into improving kindergarten to grade 12 (K-12) science teaching and learning. The current five CRYSTAL centres were selected from among 19 finalists in a national competition. SSHRC has been involved in the conception, delivery and evaluation (but not the funding) of this program, which by its very nature reaches into fields of education research under its mandate.

NSERC played a catalyst role with the CRYSTAL pilot program. However, addressing the improvement of K-12 math and science education, through research, is more within the mandate of SSHRC and the responsibility of provincial governments. The pilot program has not been successful in involving NSE researchers to the extent that was expected.

NSERC will consider in the coming years what changes should be made to the pilot CRYSTAL program in light of the findings of a recent review of this program.

Benefits to Canada:

Canada is currently ranked 20th among OECD countries in the proportion of its university graduates with degrees in science and engineering. This speaks directly to the need, identified in the Federal S&T Strategy, for building a stronger culture of science and innovation in our country and for encouraging young people to study science and engineering.

Program Activity 1.2 Support Students and Fellows					
Human Resources (FTEs) and Planned Spending (\$ millions)					
2009-10		2010-11		2011-12	
FTE	Planned Spending	FTE	Planned Spending	FTE	Planned Spending
24	\$152.20	24	\$155.14	21	\$158.72

Program Activity Expected Results	Performance Indicators	Targets
A supply of highly-qualified Canadians with leading-edge scientific and research skills for Canadian industry, government and universities.	Percentage of students supported that are actively employed in Canada after graduation	75%
	Average completion rates among NSERC award recipients vs. general NSE student population	Completion rate 10% greater than NSE student population

Program Activity Summary: This program activity supports the training of highly qualified personnel through scholarship and fellowship programs. Support is provided at all levels of university studies from undergraduate awards for four-month research terms to postdoctoral fellowships in academia or industry.

Subactivities include:

- [Undergraduate Student Research Awards \(USRA\)](#)
- [NSERC Postgraduate Scholarships \(PGS\)](#)
- [Alexander Graham Bell Canada Graduate Scholarships \(CGS\)](#)
- [Postdoctoral Fellowships \(PDF\)](#)
- [Collaborative Research and Training Experience \(CREATE\)](#)
- [Industrial Research and Development Fellowships \(IRDF\)](#)
- [Industrial Research and Development Internships \(IRDI\)](#)

Planning Highlights:

Direct funding to students in the form of **Graduate Scholarships and Postdoctoral Fellowships** provides incentives and support to the best and brightest of the next generation of discoverers and innovators for the continuation of their training. Through its competitive scholarship and fellowship programs and through stipends paid from research grants, NSERC supports undergraduates (9,502), graduate students (14,659) and postdoctoral fellows (2,340). In total, over 26,500 students are supported by NSERC. In recognition of the fact that different activities and settings offer unique learning experiences, students are offered opportunities to gain exposure to industrial as well as academic environments. An evaluation of the PGS and CGS programs is currently underway.

To respond to the evolving and broader skills needed in the research workforce, NSERC recently launched the **Collaborative Research and Training Experience** program. CREATE will support the training of teams of outstanding students and postdoctoral fellows through innovative programs that encourage collaborative and integrative approaches to address significant scientific challenges, and facilitate the transition of new researchers from trainees to productive employees in the Canadian workforce. CREATE also encourages acquisition and development of important professional skills (to complement the trainees' qualifications and technical skills), student mobility and interdisciplinary research. The first CREATE competition received 134 applications. Of these, 20 will be awarded grants in 2009.

NSERC regularly monitors the effectiveness of its scholarships programs and the needs of all sectors of the research and research user communities. Success is measured by a number of indicators, including the percentage of supported students finding gainful employment in Canada after their studies, the average salary of scholarship recipients versus the general population a few years into their career, and the average degree completion rates among recipients versus the general natural sciences and engineering student population. Continuation of this monitoring plan will enable effective monitoring of the new [Vanier Canada Graduate Scholarships](#) and [CGS - Michael Smith Foreign Study Supplements \(CGS-MSFSS\)](#) programs and inform the planned review of NSERC’s suite of scholarships and fellowships programs.

In addition, over the next two years, the new **Industrial R&D Internship Program** will match 1,200 graduate students and postdoctoral fellows with businesses all over the country for private sector research internships.

Benefits to Canada:

Student scholarship programs are a vital part of NSERC’s efforts to ensure that Canada produces a sufficient number of people with advanced degrees in science and engineering. This is essential to our future competitiveness, as is pointed out in the Federal S&T Strategy. By encouraging collaborative and integrative approaches, and addressing significant scientific challenges in priority research areas for Canada, CREATE will directly enhance opportunities for S&T graduates and contribute to Canada’s position in a knowledge-based economy. The CREATE program will give students and fellows the skills and experience to make them “job-ready”. Similarly, industrial R&D Interns will undertake research that meets the innovation needs of the host firms.

Program Activity 1.3 Attract and Retain Faculty					
Human Resources (FTEs) and Planned Spending (\$ millions)					
2009-10		2010-11		2011-12	
FTE	Planned Spending	FTE	Planned Spending	FTE	Planned Spending
11	\$167.24	11	\$166.02	11	\$166.02
Program Activity Expected Results		Performance Indicators		Targets	
Enhanced research capacity in science and engineering.		Number of foreign-educated new applicants to NSERC’s Discovery Grants program		Greater than 100 per year	
		Number of NSERC-funded professors leaving the country		Less than 100 per year	
Canada Research Chairs Database ; NSERC Research Chairs Database					

Program Activity Summary: This program activity aims to attract and retain faculty in Canada. Faculty Chair holders in the natural sciences and engineering fulfil three crucial

functions - they build capacity in areas relevant to industry, they conduct leading-edge research and they ensure that students receive the best possible training.

Subactivities include:

- [Canada Research Chairs \(CRC\)](#)
- [Industrial Research Chairs \(IRC\)](#)
- [Chairs in Targeted Areas of Research](#)

Planning Highlights:

Research chairs have proven to be a very effective tool for attracting world-class researchers and retaining the best in Canada. The **Canada Research Chairs** program has provided universities with the means to attract or retain up to 2,000 such researchers. 900 Chairs were allocated in the NSE. 30% to 40% were recruited from outside of Canada. NSERC is now involved in the Secretariat that is launching the new [Canada Excellence Research Chairs \(CERC\)](#) program announced in Budget 2008.

NSERC's **Industrial Research Chairs** are prestigious appointments, co-funded by NSERC and industrial partners, which build on existing strengths to achieve the critical mass required for a major research effort in an important area for industry. IRCs exploit and expand the complementary strengths of universities and industry. In addition to creating new knowledge and providing a stimulating training environment, these Chairs generate a range of economic and other benefits for the industrial partners and for Canada. There are currently 126 IRC awards in place across the country. The partner companies add a contribution of \$26M to NSERC's investment of \$20M.

A recent evaluation has provided strong endorsement of the IRC program. The IRC program contributes significantly to the achievement of critical mass in areas relevant to industry. It provides industry with increased access to specialized expertise and research results, facilitating transfer of knowledge and technology. It has been proven effective as a tool to recruit and retain faculty and to provide students with enhanced and industrially relevant training that better prepares them for employment. About a third of partner companies reported having hired students trained through the Chairs.

NSERC has also established Chairs to build capacity in specific target areas aligned with the priorities of government (e.g. northern research) or the needs of industry (e.g. design engineering), and for promoting the participation of women in science and engineering.

All Chairs are selected using independent examiners and panels of expert peer reviewers. NSERC's funding is highly leveraged (more than matched) by the contributions of industrial partners to the salary and research costs of the Chairholder and his/her team.

NSERC assesses the results of its Chairs programs using a number of measures. Industrial partners of IRCs report major impacts on their access to advanced knowledge relating to their business, improvements in new product or process development, stronger relationships with universities, and the ability to achieve critical mass in research capability in important areas of opportunity for their industry. Among other benefits,

more students and fellows are trained by Chairholders and higher percentages of qualified researchers are choosing to remain in Canada for their research careers.

Lessons Learned:

The [University Faculty Awards \(UFA\)](#) program encourages the hiring of female and aboriginal faculty members in the natural sciences and engineering to redress the imbalance in their number in Canadian universities. The recent evaluation of the UFA program indicated that although its goals were laudable, the program was not addressing the most critical factors causing this imbalance, nor was it focused on the optimum stage in the development of academic research careers for female and aboriginal scientists and engineers. Also, the Canada Research Chair program now offers a more prestigious and higher-paying alternative. NSERC has discontinued the UFA program and no new awards will be made.

With respect to the Aboriginal component, NSERC has recently launched the [Aboriginal Ambassadors in the Natural Sciences and Engineering \(AANSE\)](#), an outreach initiative which encourages aboriginal students to return to their communities, in partnership with science outreach organizations, to inspire other aboriginal students to enter and stay in science and math courses.

Benefits to Canada:

Top scientists and engineers serve as magnets to other high-calibre researchers and students to come to, or to remain in, Canada so that they can work with the best in the world. IRC's build capacity in areas of importance to industry. Financial and commercial impacts of IRC's are evident after several years of leveraged funding. Approximately 80% of IRC's work in the priority areas identified in the Federal S&T Strategy and in Budget 2008.

Strategic Outcome 2.0 – Discovery: High quality Canadian-based competitive research in the natural sciences and engineering

The knowledge generated through basic research provides a critical foundation for all scientific and technological advances. NSERC's discovery-based programs support long-term, ongoing programs of research, shorter-term research projects, the acquisition of research equipment and access to major research facilities. NSERC supports approximately 11,800 researchers through its various grant programs. The high quality and impact of Canadian research is evident in its ranking of 7th in the world in terms of the average number of times Canadian papers are cited by other researchers.

Program Activity 2.1 Fund Basic Research					
Human Resources (FTEs) and Planned Spending (\$ millions)					
2009-10		2010-11		2011-12	
FTE	Planned Spending	FTE	Planned Spending	FTE	Planned Spending
52	\$366.82	52	\$364.40	52	\$360.40
Program Activity Expected Results		Performance Indicators		Targets	
The discovery, innovation and training capability of university researchers in natural sciences and engineering is enhanced by the provision of support for on-going programs of basic research.		World ranking in number of publications.		Maintain top 10 world ranking (Canada is currently 7 th)	
		Percentage of funds spent on training of students and postdoctoral fellows		35%	
		Higher education expenditure on R&D (HERD) as a percentage of gross domestic product (GDP) compared to G8 countries		Maintain current world ranking (Canada is currently 2 nd)	

Program Activity Summary: This program activity promotes and enables global excellence in discovery research. Having a solid capacity for basic research across a broad range of traditional fields from Astronomy, Biology, Chemistry, Electrical Engineering, Mathematics, Mechanical Engineering, Physics and Psychology, to newly established fields like Genomics, Nanotechnology and Quantum Computing, ensures that Canada remains at the leading-edge of knowledge creation. It also ensures that Canada can access and exploit S&T developments from other countries.

Subactivities include:

- [Discovery Grants Program \(DGP\)](#)
- [Special Research Opportunity \(SRO\) Grants](#)

Planning Highlights:

The **Discovery Grants Program** is NSERC’s flagship program for building and maintaining a strong research base in Canada in the natural sciences and engineering.

Thousands of international and national experts volunteer annually to review and evaluate applications to the Discovery Grants program and to ensure that only excellent researchers and research programs are selected to receive NSERC grants.

A recent initiative within the program is the creation of [Discovery Accelerator Supplements](#). These supplemental grants give a boost to a selected number of top-flight researchers who are at a critical, high potential, stage in their research programs. This additional support helps to focus researchers on priority areas and builds global excellence and impact more quickly than otherwise. Accelerator Supplements are targeted in a timely way to those select researchers who have been identified as having made a significant breakthrough in their

research and who are expected to add significantly to Canadian global excellence. NSERC will again concentrate at least half of its Discovery Accelerator Supplements exclusively to researchers with research programs that impact the government priority areas.

A prestigious International Review Panel, comprising top executives from Canada, US, UK, Australian and European organizations, has recently completed a comprehensive, evidence-based International Review of the Discovery Grants program. This committee was asked specifically to examine whether the program's success rates were compatible with the pursuit of global excellence in Canadian research. The Panel concluded that the Discovery Grants program is an exceptionally productive research investment and deserves additional funding to ensure that the value of its grants keeps pace with the growing opportunity. The Panel also offered recommendations which NSERC is implementing as structural and operational improvements to the Discovery Grant program.

In parallel with the International Review, NSERC also carried out an assessment of its peer review practices and policies in order to successfully accommodate the evolution in many research areas and the rapid trend towards interdisciplinary and global research collaborations. This review, led by an external Advisory Committee, recommended a new structure and related policies for the merit review of proposals and for making funding recommendations. In addition, NSERC will, over the next 3 years, double the number of international experts on its peer review committees, to reach at least 15% of the membership. Such participation is crucial in fostering world-class excellence and ensuring that supported research is continuously gauged against the highest international standards.

The **Special Research Opportunities** program was set up by NSERC as a separate mechanism to evaluate and select for support those researchers who are presented with an opportunity, often with the possibility of international collaboration, to pursue a time-sensitive, high-risk research initiative.

Lessons Learned:

Based upon the findings of the International Review Panel and the strong alignment of the Discovery Grants program with the goals and principles of the S&T Strategy to build global excellence in research in Canada, NSERC has determined that this program is of high priority and high performance. In fact, more should be done to increase the visibility and brand of this truly distinctive Canadian program. Recommendations regarding structure and processes of the peer review are being implemented.

Benefits to Canada:

Global excellence in discovery research allows Canada to participate as a full player in the international research community. Canadian researchers are developing new knowledge and are also accessing and exploiting knowledge developed outside Canada, thereby generating new opportunities for innovation. National governments around the world recognize the critical role a basic research foundation plays in maintaining a competitive economy. All OECD governments support basic research in their universities.

Program Activity 2.2 Support for Research Equipment and Major Resources					
Human Resources (FTEs) and Planned Spending (\$ millions)					
2009-10		2010-11		2011-12	
FTE	Planned Spending	FTE	Planned Spending	FTE	Planned Spending
9	\$46.36	9	\$44.38	9	\$46.41
Program Activity Expected Results		Performance Indicators		Targets	
The discovery, innovation and training capability of university researchers in the NSE is supported by their access to research equipment and major regional or national research facilities.		Average number of researchers benefiting from equipment awards		Over 1500	
		Average number of researchers benefiting from a Major Research Support award		Greater than 10	

Program Activity Summary: NSERC programs in this area help support the maintenance and operation of research equipment and major research resources. Funds are also used to facilitate researchers' access to major research facilities in Canada and around the world.

Subactivities include:

- [Research Tools and Instruments \(RTI\)](#)
- [Major Resources Support \(MRS\)](#)

Planning Highlights:

NSERC facilitates access of Canadian researchers to more than 75 international, national or regional experimental facilities through the **Major Resources Support** program. Examples of major facilities in Canada are the Canadian Light Source (CLS) in Saskatchewan, Sudbury Neutrino Observatory (SNO) Lab and NorthEast Pacific Time-Series Undersea Networked Experiments (NEPTUNE) in the Pacific Ocean. All research equipment and major resource support funding decisions are carried out with external expert review and advice.

The **Research Tools and Instruments** program enhances research capacity in Canadian universities by supporting the purchase of necessary equipment of smaller size than is funded by CFI. While CFI is very effective in supporting the acquisition of large pieces of equipment and the creation of new laboratories, it falls to NSERC to support the purchase, replacement and maintenance of a large number of smaller tools and instruments that run all day, every day, in thousands of academic research labs across the country and that are necessary for both basic and targeted research.

Lessons Learned:

The role of NSERC in the provision of funding for major research facilities has changed since the establishment of the CFI, which provides partial funding for the installation and initial operations of such facilities. In light of CFI's role, NSERC has put a moratorium on

funding major equipment purchases. Following the construction and installation of CFI-funded facilities, researchers however increasingly seek NSERC support for their ongoing operations and subsequent upgrading.

Benefits to Canada:

Top researchers need state-of-the-art equipment and facilities to carry out research at world-class levels. Access to top facilities plays an important role in attracting the best minds to Canada and keeping them here.

Strategic Outcome 3.0 – Innovation: Productive use of new knowledge in the natural sciences and engineering

Turning knowledge into innovative products and services forms the basis for a competitive economy. Federal investments play an important role in stimulating innovation through the promotion of university-industry and college-industry partnerships, technology transfer activities and the training of people with appropriate scientific and business skills. Equally important is focusing research resources on areas that will have the greatest economic, social or policy impact.

NSERC **Research Partnerships Programs** take advantage of Canada’s robust capacity in research and offer a means to transfer knowledge and technologies generated in universities and colleges to industry. NSERC’s integrated set of partnerships programs ensure that support is available for the various aspects of using research talent, expertise and research results, to the benefit of Canada. Targeted projects in strategic areas encourage research in topics of identified national interest and concern. Collaborative R&D grants encourage academic researchers and graduate students to undertake joint projects with industry to address identified industrial research challenges. Commercialization programs facilitate the transfer of research results into the economy.

Program Activity 3.1 Fund Research in Strategic Areas					
Human Resources (FTEs) and Planned Spending (\$ millions)					
2009-10		2010-11		2011-12	
FTE	Planned Spending	FTE	Planned Spending	FTE	Planned Spending
21	\$124.10	21	\$133.75	21	\$135.38
Program Activity Expected Results		Performance Indicators		Targets	
Research and training in targeted and emerging areas of national importance is accelerated.		Percentage of researchers applying for a strategic grant (or who have never applied in a specific area) for the first time		Over 30%	

Program Activity Summary: This program activity funds research in areas of national importance and in emerging areas that are of potential significance to Canada.

Subactivities include:

- [Strategic Partnerships Programs](#)
- [Collaborative Health Research Projects \(CHRP\)](#)

Planning Highlights:

The **Strategic Partnerships Programs** require researchers to focus their efforts within seven targeted areas and to work with partners who can use and exploit the results of their projects. These areas were identified, after extensive consultations with industry, government departments and universities, as offering significant economic or social benefits in areas of government priority. In most cases, these correspond to existing research and economic strengths (e.g. advanced communications); in others, they correspond to areas where Canada needs to bolster its research capacity (e.g. safety and security).

The seven target areas of the Strategic Partnerships Programs include four that directly address the priorities identified in the S&T Strategy and Budget 2007: environmental science and technologies, natural resources and energy, information and communications technologies and health, and related life sciences and technologies. The other target areas are competitive manufacturing (a priority identified in Budget 2008), safety and security, and quality food and novel bio-products (both noted in the [Speech from the Throne, 2007](#)). The Strategic Partnerships Programs will be a main instrument to deliver the \$34 million new funds allocated in Budget 2008 for collaborative research that directly contributes to the knowledge and innovation needs of Canada's automotive, manufacturing, forestry and fisheries industries. In addition to funding these areas, NSERC's efforts will be to maintain linkages with these industrial sectors over the next five years: a) to ensure our investment strategy remains aligned with the needs of the industries; b) to monitor and report on adoption, early impact and longer term outcome of the investments; and c) to enable efficient technology and knowledge transfer to the industrial sectors to maximize utilization and impact of the supported research activities.

Another component of NSERC's programs in strategic areas is the **Collaborative Health Research Projects** program. This is a collaborative effort in the priority area of health that is co-funded by NSERC and CIHR. The program integrates the efforts of natural scientists and engineers with health scientists and funds research targeted on improving the health of Canadians.

All Strategic Partnerships project applications undergo thorough peer review by external experts from industry, the academic community and government to ensure the support of excellent and relevant research involving partnerships with end users.

Evidence of success in Strategic Partnerships Programs is gathered through the progress and final reports submitted for each project and through follow up surveys of recipients. These reveal increases in the number of user organizations participating in research projects, high satisfaction of industrial partners and other users with the outcomes of

specific projects, and increasing amounts of leveraged industrial funding for research. Within the identified target areas, knowledge creation is accelerated, real-world problems are solved, and the experience gained by researchers and students benefits end-user communities. Well-paying, high-quality employment opportunities are created for graduates. Long-term relationships are established between industries, government agencies and postsecondary institutions.

NSERC supports nearly 600 projects and networks in its Strategic Partnerships programs, each having the potential to strongly enhance Canada’s economy, society and/or environment within the next 10 years. The 24 Strategic Networks currently supported by NSERC represent national platforms with sufficient critical mass to have significant impact on research areas of importance to Canada. More than \$21 million was contributed by over 600 firms to support research in strategic areas in 2007-08.

NSERC also supports research in emerging areas where Canada is establishing strength. An innovation platform in Quantum Computing currently receives \$1.3 million per year.

Benefits to Canada:

To take advantage of Canada’s established excellence in research and innovation, and to build capacity in areas critical to the Canadian economy, NSERC invests in carefully selected strategic priorities for the country. For maximum effect, these investments support a range of activities with the common goal of connecting researchers with end users in order to transfer and exploit knowledge and to increase Canadian prosperity.

Program Activity 3.2 Fund University-Industry-Government Partnerships					
Human Resources (FTEs) and Planned Spending (\$ millions)					
2009-10		2010-11		2011-12	
FTE	Planned Spending	FTE	Planned Spending	FTE	Planned Spending
42	\$109.29	42	\$105.67	43	\$104.08
Program Activity Expected Results		Performance Indicators		Targets	
Mutually beneficial collaborations between the private sector and researchers in universities, resulting in industrial or economic benefits to Canada.		Percentage growth in partner contributions		Greater than 5%	
		Partner satisfaction with research results		75% of partners indicating satisfaction	

Program Activity Summary: NSERC’s programs under this activity foster collaborations between university researchers and industry in order to develop new knowledge and expertise and to transfer this knowledge and expertise to Canadian-based companies. The selected projects lever more industrial R&D spending than is invested by NSERC.

Subactivities include:

- [Collaborative Research and Development \(CRD\)](#)
- [Networks of Centres of Excellence \(NCE\)](#)

Planning Highlights:

A recent follow-up study of the **Collaborative Research and Development Grants** program by independent experts has shown that this is an extremely effective program for building productive linkages between firms and the universities. NSERC supports more than 1,000 university researchers working in partnership with industry through the CRD Grants program. NSERC's CRD projects lever the investment of more than \$50 million of industrial funding in joint industry-university research projects. These partnership programs and projects address real-world challenges and help train an estimated 500 undergraduate students, nearly 1,200 postgraduate students and approximately 200 postdoctoral fellows in collaboration with industry.

Indicators of success in this activity include the high cash and in-kind contributions of partners to joint industry-university projects (on average \$1.76 for every dollar invested by NSERC), high partner satisfaction with the results of the research as reported in progress and final reports and follow-up studies on the projects. Other measures are partner use of results in new products and processes, the number of start-up companies, growing numbers of companies involved in collaborative projects, and continuing growth in the employment of qualified graduates in these firms. Demand in this program is growing at better than 8 percent per year, with a strong growth in the number of small and mid-sized businesses participating. NSERC allocates sufficient funding each year to meet the growing demand for these projects. A comprehensive evaluation of the program will take place in 2009-10. The current economic situation is expected to impact partner participation. NSERC is considering how to increase its flexibility and adapt to this changing economic situation in order to encourage continued growth in university-industry research collaborations.

NSERC will explore a **Pre-Collaborative Research and Development (Pre-CRD)** grant pilot program, with a reduced requirement for partner contribution, to increase the number of university-industry interactions and partnerships. NSERC's experience has shown that successful long-term collaborations often begin first as a small joint CRD project that tests the value of the university-industry relationship. These small projects often progress to larger collaborative projects and, in some cases, to an Industrial Research Chair, a major financial commitment for both the company and the university researcher that extends over the long-term (a minimum of five years).

The CRD program mechanism will be one of the approaches used to fund projects in the new **Automotive R&D Partnership**. The Partnership, which involves collaboration between NSERC, NRC, Industry Canada, SSHRC, CFI, NRC and the automotive industry, aims to foster an innovative and competitive Canadian auto industry through industry-led collaborative research and development. A flexible and integrated approach to project review and funding will be used to build a critical mass of research in the priority areas. It is anticipated that the Partnership will proactively engage industry with

academic and NRC researchers through the establishment of a dedicated Project Office, to be co-located with an Ontario Centre of Excellence and NSERC’s Ontario Regional Office.

The **Networks of Centres of Excellence Program**, established in 1989, is a unique tri-agency approach to pooling the research resources of academia, government and industry to improve Canadians' quality of life and make our economy stronger. The NCE Program currently supports 18 networks that encourage scientists from across Canada and across a variety of disciplines to work together conducting research that builds a Canadian advantage. During 2007-08, the NCE program supported 1,370 researchers and 4,974 highly qualified personnel partnered with 643 companies, 294 provincial and federal government departments and agencies, 53 hospitals, 238 universities, and 441 other organizations from across Canada and around the world. Collectively, the networks were able to attract cash and in-kind investments of \$69 million, including \$18 million from the private sector.

A new suite of programs to be managed by the NCE Tri-agency Secretariat was announced in Budget 2007. Among these, four new [Business-led NCEs](#) launched in 2009 will fund large-scale collaborative research and commercialization activities to support private sector innovation in areas of strategic importance to Canada.

Benefits to Canada:

CRD and NCE partnership programs and projects address real-world challenges and train highly qualified personnel in collaboration with industry.

Program Activity 3.3 Support Commercialization					
Human Resources (FTEs) and Planned Spending (\$ millions)					
2009-10		2010-11		2011-12	
FTE	Planned Spending	FTE	Planned Spending	FTE	Planned Spending
17	\$46.38	17	\$26.84	17	\$26.84
Program Activity Expected Results		Performance Indicators	Targets		
The transfer of knowledge and technology residing in Canadian universities and colleges to the user sector is facilitated.		Increase in technology and knowledge transfer activities	5% growth		

Program Activity Summary: NSERC’s programs under this activity aim to build the capacity of Canadian universities and colleges to transfer knowledge and technology from academic research laboratories to Canadian companies. They support the pre-commercial development of promising innovations and help build capacity to manage intellectual property. Canadian companies have access to publicly supported research results, licenses are granted and spin-off companies are created. As with NSERC’s

partnerships programs, federal funding serves to leverage significant amounts of private funding.

Through a number of subactivities, NSERC will foster:

- [Intellectual Property Mobilization \(IPM\)](#)
- [Idea to Innovation \(I2I\)](#)
- [Centres of Excellence for Commercialization and Research \(CECR\)](#)
- [College and Community Innovation \(CCI\)](#)

Planning Highlights:

Through the **Idea to Innovation** program (cited in Budget 2007), NSERC currently supports 69 projects to accelerate the pre-competitive development of promising university and college-developed technology and promotes its transfer to industry.

NSERC has established strong interactions with the other major federal agencies for encouraging industrial innovation, the NRC Industrial Research Assistance Program (NCR-IRAP) and the Business Development Bank of Canada. Small and medium enterprises (SMEs) are a particular target in this relationship. The three organizations have established regional Hub-Committees to work together to promote better knowledge of, and increased participation in, their various programs in a seamless way. Among other joint activities, these Committees are helping to facilitate the flow of innovation funded through NSERC's I2I program on to industrial development.

The **Centres of Excellence for Commercialization and Research Program** launched 11 new centres in 2008 and will launch 6 new CECRs in 2009. Established in areas of strategic importance to Canada, these world-class centres bring together researchers and partners from companies, universities and government labs who work collaboratively on leading-edge research and on the practical application of that research to benefit Canadians through commercialization.

Colleges play an important role in local and regional development. Colleges are located in over 900 communities across the country. The **College and Community Innovation Program** successfully builds bridges between community colleges and local industry. The pilot program launched by NSERC in 2004 received a positive mid-term evaluation in 2006 and, in Budget 2007, the government announced a new permanent program under the management of NSERC based upon an expanded CCI program. Building on the experience gained in the pilot program, the new CCI was launched in January 2008 and held three competitions to launch up to eight new college and community innovation projects.

Lessons Learned:

The CCI program was first launched by NSERC as a pilot program in 2004 in order to demonstrate the feasibility of increasing innovation at the community and/or regional level by building capacity in applied research at colleges. The mid-term review of this pilot demonstrated the effectiveness of the program in stimulating collaboration between Canadian colleges and local firms to support the development, adaptation, and adoption of new

technologies. This was the objective of the NSERC pilot program and it continues as the main objective of the permanent program.

In managing the pilot, it became clear that colleges across the country are not all operating, nor are they resourced, in the same manner. As a result, in establishing the permanent program, consultations were undertaken with all of the provinces and with groups of colleges, such as the Association of Canadian Community Colleges (ACCC) and Polytechnics Canada, to ensure alignment of the CCI program with the goals of the participants and other governments. The pilot also revealed that Colleges need stable financial support to be able to carry out applied R&D projects with local industry, in particular SMEs, and so the requirement for leveraging was removed from the permanent program. The mid-term evaluation and interactions with the pilot program award recipients revealed that support from the senior administration within the institutions is an important success factor. We have also learned that having research administration and infrastructure in place in the college, a committed and interested faculty, and dedicated staff for applied R&D are key to facilitating applied R&D at the colleges and thus to achieving the goals of this program. These elements have been integrated into the design of the permanent program. To ensure continuing college advice, NSERC established a College & Community Innovation Advisory Committee that worked with the Private Sector Advisory Board (PSAB) to finalize the CCI program description.

Benefits to Canada:

Canada has been evaluated as being among the world leaders in the excellence of our academic research. Transferring and translating this excellence into societal and economic benefit is a high priority for NSERC. Success in these efforts requires not only expertise in technology transfer and the careful management of intellectual property, but also building expertise in entrepreneurship and creating an environment that allows potential business ventures to thrive. The CECR is changing the context for academic technology transfer and commercialization, bringing new strength to an already productive area.

Strategic Outcome for Internal Services

The following program activity supports all strategic outcomes within this organization.

Program Activity 4.1 Internal Services					
Human Resources (FTEs) and Planned Spending (\$ millions)					
2009-10		2010-11		2011-12	
FTE	Planned Spending	FTE	Planned Spending	FTE	Planned Spending
180	\$25.91	180	\$25.91	182	\$25.91

Internal Services

Internal Services are groups of related activities and resources that are administered to support the needs of programs and other corporate obligations of an organization. These groups are: Management and Oversight; Communications; Legal; Human Resources Management; Financial Management; Information Management; Information Technology; Real Property; Material; Acquisition; and Travel and Other Administrative Services. Internal Services include only those activities and resources that apply across NSERC and not to those provided specifically to a program.

Section III – Supplementary Information

List of Tables

The tables listed below are available at the Treasury Board Secretariat's website:

- Details of NSERC Transfer Payment Programs
- Internal Audits
- Evaluations
- Sources of Respendable and Non-Respendable Revenue