# Natural Sciences and Engineering Research Council of Canada

## 2012-13

### Report on Plans and Priorities

---

**The Honourable Christian Paradis**
Minister of Industry and Minister of State for Agriculture

# Table of Contents

# Minister's Message

Over the past year, the Canadian economy has proven to be resilient despite continued fiscal uncertainty in other parts of the world. Since our government introduced Canada's Economic Action Plan in 2009 to respond to the global recession, Canada has recovered not only all of the jobs lost during the recession but also all of our economic output.

As Minister of Industry, I am confident that the Industry Portfolio will play a key role in our government's plan to strengthen Canada's knowledge-based economy. Our efforts will focus on promoting innovation and modernizing Canada's marketplace policies, among other areas.

In 2012–13, the Natural Sciences and Engineering Research Council of Canada (NSERC) will create new opportunities for Canadian scientists and engineers to become global research leaders. It will also enhance its promotion of international research collaborations. NSERC will further support the increasing engagement of colleges and universities in Canada's innovation system and will build a competitive advantage for Canada by creating more strategic partnerships with the private sector and training more graduates in the skills needed for tomorrow's economy.

A significant part of the Industry Portfolio's activities will involve developing Canada's digital economy by updating copyright and privacy laws and building a world-class digital infrastructure for next-generation wireless technologies and services. We will also put in place conditions that allow small businesses to grow and create jobs. This will mean reducing red tape, improving access to credit and focusing programs to promote more effective research and development.

Since coming to office, our government has made science and innovation a priority. We will leverage our past investments and continue to develop and recruit world-leading research talent. We will also take measures to encourage the private sector to increase research and development investments and improve commercialization outcomes.

In our government's pursuit to improve the well-being of Canadians, we will continue to work to secure the recovery, eliminate the deficit and invest in the drivers of long-term economic growth. We will also implement our plan to find savings in government expenditures to return to fiscal balance in the medium term.

This year's Report on Plans and Priorities for NSERC delivers a comprehensive approach to promote and maintain Canada's strong and competitive economy. I look forward to working with my Cabinet and departmental colleagues, as well as with the private sector and other levels of government, to achieve our common goal of creating jobs and growth for all Canadians.

Christian Paradis

Minister of Industry and Minister of State (Agriculture)

# Minister of State's Message

As the Minister of State for Science and Technology, I am pleased to present the 2012–13 Report on Plans and Priorities for the Natural Sciences and Engineering Research Council of Canada (NSERC).

This year promises to be noteworthy, not only for Canada but also for the world. As economies across the globe begin to emerge from challenging economic times, Canada continues to thrive. Our financial system is strong, our economy has recovered all of the jobs and economic output lost during the recession, and our government has a low-tax plan that will continue to create jobs, economic growth and long-term prosperity across the country.

Our government recognizes the vital role that science and technology play in Canada's continued economic leadership. In this globalized and connected digital world, innovation will be the driver of economic growth. We understand this, and we are committed to supporting Canadian research and development (R&D) in both public and private sectors.

This year will see our government take specific actions to improve Canada's performance with respect to private sector R&D, following last year's report from the expert panel charged with the review of federal support for R&D. These actions will build on our investments to date and will seek to promote commercialization and the development of new products and services for Canadians.

In 2012–13, NSERC will maintain its support for academia-industry collaborations that foster more diversity in the Canadian economy. This year, NSERC will hold a national competition to support atmospheric and climate change research in Canada. Through a number of similar programs and grants, NSERC will support R&D at the regional and community levels across the country while continuing to provide Canadian scientists and engineers with the necessary support that enables them to push the boundaries of modern scientific research. NSERC remains committed to ensuring Canada's place in the global scientific community.

Canadians can and should be proud. Our government recognizes that we cannot take our success for granted. We must build on our past accomplishments in order to continue to grow, create jobs and lead the world for years to come. We are committed to achieving this, and it will be driven in no small part by science, research and innovation.

As we move into 2012–13, I will continue to work with our academic partners, the private sector and all Canadians to achieve the priorities laid out in this report.

Gary Goodyear

Minister of State (Science and Technology) (Federal Economic Development Agency for Southern Ontario)

# Section I: Organizational Overview

## Raison d'être

The Natural Sciences and Engineering Research Council of Canada (NSERC) is a leader in making Canada a country of discoverers and innovators for all Canadians. NSERC aims to maximize the value of public investments in research and development (R&D) and to advance prosperity and quality of life in Canada. In today's highly competitive knowledge economies, NSERC plays a key role in Canada's innovation system. NSERC offers programs that support postsecondary research in the natural sciences and engineering (NSE) on the basis of national, peer-reviewed competitions. NSERC supports partnerships and innovation to make it easier for industry to collaborate with academia and access the wealth of resources Canada's first-rate academic system has to offer. NSERC develops the next generation of talented scientists and engineers through its scholarships and research stipends, and increases the visibility of Canadian research.

**NSERC Quick Facts**

**President:** Dr. Suzanne Fortier

**Chair:** The Honourable James Edwards

**Budget:** 1.07 $ billion (2011-12)

**Head Office:** Ottawa, Ont.

**Regional Offices:**

- Moncton, N.B.
- Montreal, Que.
- Winnipeg, Man.
- Vancouver, B.C.
- Mississauga, Ont.

**Employees:** 376 Full-time Equivalents (FTEs)

**Reach:**

- 29,200 students and postdoctoral fellows
- 11,800 university professors
- 1913 Canadian companies
- over 140 universities and colleges

## Responsibilities

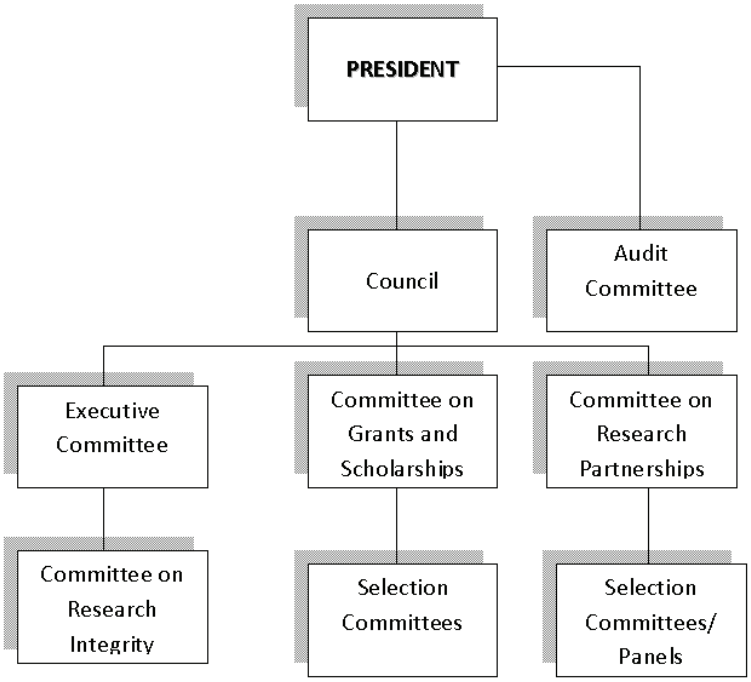
NSERC is a departmental corporation of the Government of Canada created in 1978. It is funded directly by Parliament and reports to it through the Minister of Industry. NSERC's Council is composed of the President and up to 18 other distinguished members selected from the private and public sectors. 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 fiscal year 2012-13, NSERC will invest over $1 billion in postsecondary research and training in the NSE. NSERC's budget represents ten percent of the federal government's expenditures for science and technology (S&T), and twenty percent of all university R&D funding in the NSE.

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

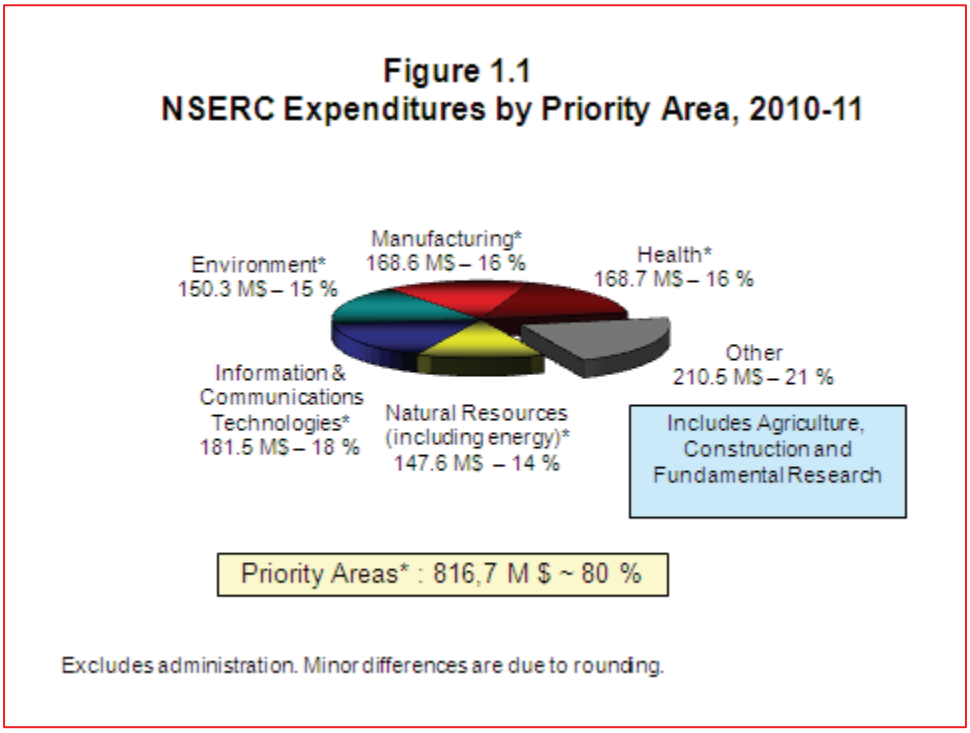
**NSERC's Governance Structure**




NSERC's focus on people, discovery and innovation maps directly onto the federal science and technology (S&T) strategy which emphasizes building a People Advantage, a Knowledge Advantage and an Entrepreneurial Advantage for Canada. All of NSERC's funding relates to these advantages. In addition, the majority of NSERC's expenditures are in areas that fall under

the S&T priorities established by the government. The following figure highlights NSERC's priority area expenditures in 2010-11.

**Figure 1.1 NSERC Expenditures by Priority Area in 2010-11**




## Strategic Outcome(s) and Program Activity Architecture (PAA)

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

1. **People:** Highly skilled science and engineering professionals in Canada

2. **Discovery:** High-quality Canadian-based competitive research in the natural sciences and engineering

3. **Innovation:** Knowledge and skills in the natural sciences and engineering are transferred to, and used productively by, the user sector in Canada

# Program Activity Architecture

## Strategic Outcomes

**1.0 People**

**Highly skilled science and engineering professionals in Canada**

**2.0 Discovery**

**High-quality Canadian-based competitive research in the natural sciences and engineering**

**3.0 Innovation**

**Knowledge and skills in the natural sciences and engineering are transferred to and used productively by the user sector in Canada**

## Program Activities

### 1.1 Promote Science and Engineering
**Sub-Activities**
1.1.1 PromoScience
1.1.2 Prizes

### 1.2 Support Students and Fellows
**Sub-Activities**
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 Vanier Canada Graduate Scholarships*
1.2.5 Postdoctoral Fellowships
1.2.6 Banting Postdoctoral Fellowships*
1.2.7 Collaborative Research and Training Experience

### 1.3 Attract and Retain Faculty
**Sub-Activities**
1.3.1 Canada Excellence Research Chairs*
1.3.2 Canada Research Chairs*
1.3.3 University Faculty Awards

### 2.1 Fund Basic Research
**Sub-Activities**
2.1.1 Discovery Grants
2.1.2 Special Research Opportunity Grants

### 2.2 Support for Research Equipment and Major Resources
**Sub-Activities**
2.2.1 Research Tools and Instruments Grants
2.2.2 Major Resources Support Grants

### 3.1 Fund Research in Strategic Areas
**Sub-Activities**
3.1.1 Strategic Partnerships
3.1.2 Collaborative Health Research Projects*

### 3.2 Fund University-Industry-Government Partnerships
**Sub-Activities**
3.2.1 Industrial Research and Development Internships*
3.2.2 Industrial Research and Development Fellowships
3.2.3 Industrial Research Chairs
3.2.4 Collaborative Research and Development Grants
3.2.5 Networks of Centres of Excellence*
3.2.6 Business-Led Networks of Centres of Excellence*

### 3.3 Support Commercialization
**Sub-Activities**
3.3.1 Idea to Innovation Program
3.3.2 College and Community Innovation Program*
3.3.3 Centres of Excellence for Commercialization and Research*

**The following program activity supports all strategic outcomes within NSERC**

### 4.1 Internal Services
**Sub-Activities**
- Governance and Management Support
- Resource Management Services
- Asset Management Services

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

## Organizational Priorities

| Priority | Type | Strategic Outcome |
|---|---|---|
| **People Advantage** | Ongoing | 1.0 People |
| **Description:** Inspire new generations of students to pursue careers in science and engineering, and provide them with the means to develop their full potential. | | |
| **Why is this a priority?**<br>• To build a stronger culture of science and innovation in our country recognizing that an innovative and competitive society relies on the creativity and skills of highly trained people in the NSE, as identified in the federal S&T strategy;<br>• To ensure Canada has a supply of highly qualified people by supporting university students and fellows during their training in research and by providing them with opportunities to develop professional, job-ready skills and to experience enriched and varied research environments;<br>• To encourage young people to study science and engineering and become the talented science and technology graduates Canada needs to compete and win as identified in the federal S&T strategy; and<br>• To position Canada as a destination of choice for top foreign students and researchers, as many foreign students will elect to stay in Canada at the end of their studies.<br>**Plans for meeting the priority:**<br>• An industrial stream will be implemented within the Collaborative Research and Training Experience program to develop highly qualified people with job-ready skills in the NSE.<br>• PromoScience grants will continue to support outreach activities aimed at groups which are currently under-represented in NSE fields in Canada (such as women and Aboriginals).<br>• NSERC will work together with the Social Sciences and Humanities Research Council (SSHRC), the Canadian Institutes for Health Research (CIHR), the Department of Foreign Affairs and International Trade (DFAIT) and universities to extend the reach of the Banting Fellowships program and Vanier Scholarships program to attract more foreign talent to Canada. | | |

| Priority | Type | Strategic Outcomes |
|---|---|---|
| **Knowledge Advantage** | Ongoing | 1.0 People<br>2.0 Discovery |

**Description:** Lead the advancement of knowledge in science and engineering, and ensure that Canadian scientists and engineers are leaders and key players in a global knowledge community.

**Why is this a priority?**

- To advance the Knowledge Advantage identified in the federal S&T strategy by maintaining the capacity to conduct world-class research in the broad areas of NSE;
- To support excellence and seed the creativity that will lead to future innovation;
- To capitalize on benefits arising from Canadians leading or participating in international collaborations; and
- To increase productivity, innovation, jobs, and prosperity.

**Plans for meeting the priority:**

- Following investments included in Budget 2011, the Discovery Grants Program will increase its support of early career researchers to allow them to establish and maintain high quality research programs and to train students.
- Ten new Canada Excellence Research Chair proposals will be evaluated and the second phase of the competition launched in collaboration with SSHRC and CIHR.
- A national competition to support Climate Change and Atmospheric Research (CCAR) at Canadian post-secondary institutions will be launched with funding provided in Budget 2011. NSERC will participate in an international forum of funding agencies to support collaborations that address global change.
- NSERC and Canada Foundation for Innovation (CFI) will collaborate in the oversight and monitoring of successful funding applications under both the CFI's Major Science Initiatives program and NSERC's Major Resources Support program competitions.

| Priority | Type | Strategic Outcome |
|---|---|---|
| **Entrepreneurial Advantage** | Ongoing | 3.0 Innovation |

**Description:** Connect and apply the strength of the academic research system to addressing the opportunities and challenges of building prosperity for Canada.

**Why is this a priority?**

- To connect Canada's research strength to industry to promote innovation and prosperity in Canada. Innovation and prosperity in Canada can be enhanced by more effectively connecting this research strength to industry, particularly in areas of strategic importance.
- To stimulate business investment in R&D in Canada. Business investment in R&D (BERD) in Canada is low relative to other Organization for Economic Cooperation and Development (OECD) countries with the majority of private sector R&D investment in Canada being concentrated in a small number of large companies.

- To enable innovation to enhance the productivity of Canadian industry. Canadian industry has a productivity gap with other leading nations, one that can partly be addressed through innovation[1].

**Plans for meeting the priority:**

- A Canada-India Research Centre of Excellence (CIRCE) will be established as part of the Government of Canada's wider India Engagement Strategy. The CIRCE will be overseen by a Steering Committee which includes participation by Industry Canada, Health Canada, SSHRC, CIHR and Canada Foundation for Innovation.
- The Industrial Research Chairs for Colleges and the College-University Idea to Innovation grants will be rolled-out for the first time in 2012-13.
- The Idea to Innovation program will be combined with CIHR's Proof-of-Principle program to offer a single window of support for post-secondary commercialization efforts and optimize funding to promising commercialization ventures.
- A joint pilot initiative will be implemented with the International Science and Technology Partnerships Program Canada to extend the Canadian academic-industry relationship to include an international connection with China, Brazil and India.

| Priority | Type | Strategic Outcomes |
|---|---|---|
| **Accountability** | Ongoing | 1.0 People<br>2.0 Discovery<br>3.0 Innovation |

**Description:** Demonstrate NSERC's accountability and how the results of its investments in Canadian research and training benefit Canadians.

**Why is this a priority?**

- 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.

**Plans for meeting the priority:**

- NSERC will place greater emphasis on performance, evaluation and audit/risk analysis activities to ensure that programs and services are offered in a strategic, coherent and cost-

[1] Recent analyses and strategies the Science and Technology Innovation Council [STIC] State of the Nation Report [2010], the Council of Canadian Academies [CCA] Innovation and Business Strategy: Why Canada Falls Short [2009] indicate that Canada needs to better leverage its R&D and accelerating innovation and that public-private R&D partners will help achieve this goal.

effective manner and support a more results-oriented culture.

- NSERC is working cooperatively with SSHRC, CIHR and CFI in order to improve the coordination of programs, activities and policies.
- NSERC will work in collaboration with CIHR and SSHRC to develop a policy on access to research outputs.
- NSERC will implement the new Tri-Agency Framework: Responsible Conduct of Research with CIHR and SSHRC. The framework includes the already established Secretariat and Panel on the Responsible Conduct of Research.
- NSERC is currently revising and will implement the tri-agency Memorandum of Understanding on the Roles and Responsibilities in the Management of Federal Grants and Awards by winter 2012.
- NSERC will continue to develop and practice integrated planning to support the development of a multi-year strategic plan, an annual corporate plan, annual divisional plans and annual budget plan.

| Priority | Type | Strategic Outcomes |
|---|---|---|
| **Visibility** | Ongoing | 1.0 People<br>2.0 Discovery<br>3.0 Innovation |
| **Description:** Increase visibility of Canadian research. | | |

**Why is this a priority?**

- To demonstrate the value of federal government investment in science and technology to Key Opinion Leaders (KOLs) and to demonstrate to industry that there is value in partnering with federally supported researchers to achieve mutually beneficial objectives.

**Plans for meeting the priority**

- NSERC will work to increase its outreach and visibility to the Canadian public by leveraging relationships with researchers and communications departments at colleges and universities, and by establishing new partnerships to connect with industry and KOLs.

## Risk Analysis

NSERC's strategic and operational priorities are managed and monitored according to NSERC's Corporate Risk Profile which is updated annually.

In alignment with Treasury Board Secretariat guidelines and management frameworks, NSERC developed its Corporate Risk Profile in 2011-12 to formally identify, assess and mitigate corporate risks. A number of risks were identified and mitigation strategies were developed. The two risks which may impact NSERC's plans and priorities over the reporting period are summarized below:

| Risk | Mitigation |
|---|---|
| **Information Technology Innovation:** The risk that the organization does not adequately leverage technology to support the needs of the organization, to promote efficiency or to innovate (i.e. services and processes). | The IMIT Strategy that was introduced at NSERC in 2011-12 will serve to proactively lever technology to improve the efficiency of internal operations and client service. |
| **Budget Management:** The risk that the organization is ineffective in managing, controlling and monitoring budgets and making informed/accurate resource-related decisions. | Implementation of a modernized corporate resource management framework and integrated planning at NSERC mitigate against this risk. |

**Operating Environment**

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 the interests of, the Canadian public.

**Operational Risks**

The risks that were identified are reflective of current economic times of fiscal constraint which require innovative approaches and new technologies to improve efficiency within organizations.

NSERC experiences risks related to the current economic situation that are integral to all of its programs and that could influence plans, priorities, performance and decision making over the three-year reporting period.

## Planning Summary

**Financial Resources ($ millions)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 1,049.6 | 1,036.6 | 1,036.6 |

**Human Resources (Full-Time Equivalent—FTE)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 388 | 388 | 388 |

| **Strategic Outcome 1.0:** People – Highly skilled science and engineering professionals in Canada | |
|---|---|
| **Performance Indicators** | **Targets** |
| Total researchers per thousand employed relative to other OECD countries | Maintain top 10 world ranking (Canada was 8th in 2005[2]) |
| Employment rate of university graduates in the NSE vs. general population | NSE unemployment rate less than rate for general population by at least 1 percentage point |

[2] Main Science and Technology Indicators, OECD 2008

| Program Activity | Forecast Spending 2011–12 | Planned Spending ($ millions) | | | Alignment to Government of Canada Outcomes[3] |
|---|---|---|---|---|---|
| | | 2012–13 | 2013–14 | 2014–15 | |
| 1.1 Promote Science and Engineering | 5.5 | 5.8 | 5.8 | 5.8 | Innovative and Knowledge-based Economy |
| 1.2 Support Students and Fellows | 149.8 | 141.8 | 141.8 | 141.8 | |
| 1.3 Attract and Retain Faculty | 152.6 | 153.0 | 153.0 | 153.0 | |
| **Total Planned Spending** | | 300.6 | 300.6 | 300.6 | |

| **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 20 world ranking (Canada was 16th in 2008[4]) |
| Per capita output of publications in the NSE. | Top 10 ranking in the world[5] |

[3] While outcomes of the activities supported can affect several of the Government of Canada outcomes such as strong economic growth, income security and employment for Canadians, a clean and healthy environment, healthy Canadians with access to quality health care, and safe and secure communities; "Innovative and Knowledge-based Economy" is most appropriate to link NSERC's resources and results.

[4] Observatoire des sciences et des technologies, 2008.

[5] Observatoire des sciences et des technologies, 2008.

| Program Activity | Forecast Spending 2011–12 | Planned Spending ($ millions) | | | Alignment to Government of Canada Outcomes |
|---|---|---|---|---|---|
| | | 2012–13 | 2013–14 | 2014–15 | |
| 2.1 Fund Basic Research | 363.4 | 366.6 | 368.0 | 368.0 | Innovative and Knowledge-based Economy |
| 2.2 Support for Research Equipment and Major Resources | 38.0 | 37.1 | 23.0 | 23.0 | |
| **Total Planned Spending** | | 403.7 | 391.0 | 391.0 | |

| **Strategic Outcome 3.0:** Innovation ─ Knowledge and skills in the natural sciences and engineering are transferred to and used productively by the user sector in Canada | |
|---|---|
| **Performance Indicators** | **Targets** |
| Percentage growth in the annual number of partner companies | Greater than five percent per year |
| Comparison of percentage of HERD funded by industry to OECD countries | Top quartile ranking |

| Program Activity | Forecast Spending 2011–12 | Planned Spending ($ millions) | | | Alignment to Government of Canada Outcomes |
|---|---|---|---|---|---|
| | | 2012–13 | 2013–14 | 2014–15 | |
| 3.1 Fund Research in Strategic Areas | 116.4 | 106.6 | 95.8 | 85.5 | Innovative and Knowledge-based Economy |
| 3.2 Fund University-Industry-Government Partnerships | 179.0 | 171.8 | 181.0 | 191.5 | |
| 3.3 Support Commercialization | 58.6 | 42.9 | 44.1 | 43.9 | |
| **Total Planned Spending** | | 321.3 | 320.9 | 320.9 | |

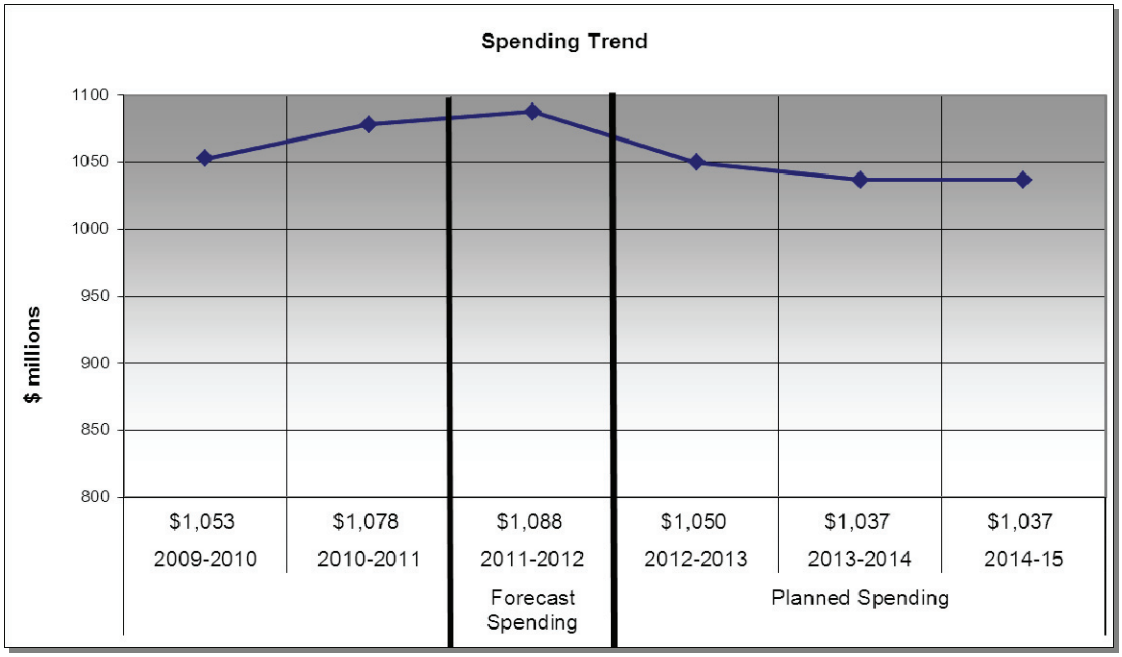
| Program Activity | Forecast Spending 2011–12 | Planned Spending ($ millions) | | |
|---|---|---|---|---|
| | | 2012–13 | 2013–14 | 2014–15 |
| 4.1 Internal Services* | 25.8 | 24.0 | 24.1 | 24.1 |
| **Total Planned Spending** | | 24.0 | 24.1 | 24.1 |

* Internal Services include activities and resources that apply across NSERC. These do not include activities and resources provided for specific programs.

## Expenditure Profile

For the 2012-13 fiscal year, NSERC plans to spend 1,049.6 $ million to meet the expected results of its program activities and contribute to its strategic outcomes. The figure below illustrates NSERC's spending trend from 2009-10 to 2014-15.

**Departmental Spending Trend**




**Spending increase:**
From 2009-10 to 2011-12, the following new investments were made:

- $2.5 million in 2009-10 and $1 million in 2010-11, for the Industrial R&D Internships (IRDI) program as part of Canada's Economic Action Plan (**Budget 2009**);

- $14 million in 2009-10, $14 million in 2010-11, and $7 million in 2011-12 for a temporary expansion of the Canada Graduate Scholarships (CGS) program as part of Canada's Economic Action Plan (**Budget 2009**);

- $13 million per year in 2010-11 for advanced research and for the Strategy for Partnerships and Innovation (Budget 2010);

- $15 million per year to the College and Community Innovation Program to increase innovation at the community and/or regional level (**Budget 2010**);

- $45 million over five years to all three granting councils to establish the Banting post-doctoral fellowships program (**Budget 2010**);

- $35 million over five years to support climate change and atmospheric research at Canadian post-secondary institutions (**Budget 2011**);

- $3 million in 2011-12 and $5 million per year on a permanent basis starting in 2012-13 to support 30 new Industrial Research Chairs at colleges (**Budget 2011**);

- $15 million per year to support outstanding research in the naturals sciences and engineering fields, such as the Strategy for Partnerships and Innovation;

- $12 million over five years, starting in 2011-12 to support college-university collaboration through the Idea to Innovation program (**Budget 2011**);

- $53.5 million over five years to support the creation of 10 new Canada Excellence Research Chairs, some of which will be in fields relevant to the digital economy (**Budget 2011**);

- $15 million over five years for a competition to select a Canada-India Research Centre of Excellence (**Budget 2011**).

**Spending decrease:**
Over the period covered by this report, decreases resulted from the following:

- The funding for the BL-NCE program is scheduled to sunset in 2012-13. The program supported four industry-led networks over five years with a total budget of $46 million earmarked in Budget 2007 and administered by NSERC.

- The last portion of the $38.5 million received by NSERC as part of Canada's Economic Action Plan for additional Canada Graduate Scholarships and Industrial Research and Development Internship awards will be spent in 2011-12.

## Estimates by Vote

For information on our organizational appropriations, please see the 2012–13 Main Estimates publication.

# Section II: Analysis of Program Activities by Strategic Outcome(s)

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

### Program Activity 1.1: Promote Science and Engineering

**Program Activity Description**

This program activity stimulates the public's interest in science, math and engineering and encourages the next generation of students to consider careers in these fields, helping to ensure that Canada has an ongoing supply of future discoverers and innovators. These activities are necessary as Canada has fewer university students enrolled in the natural sciences and engineering disciplines and fewer PhDs graduating and working in these fields, relative to most OECD countries. NSERC awards grants to support activities of community based organizations, museums, science centres and universities that stimulate the interest of young people and students and improve school performance in science and mathematics. In addition, NSERC offers several prizes that recognize and highlight Canadian achievements in training, research and innovation.

**Financial Resources ($ millions)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 5.8 | 5.8 | 5.8 |

**Human Resources (Full-Time Equivalent—FTE)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 1 | 1 | 1 |

| 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 percent. |

## Planning Highlights

**1) PromoScience:** In 2012-13, NSERC will continue to focus more of the support that is available through PromoScience grants towards outreach activities aimed at groups that are under-represented in the natural sciences and engineering (e.g. women, Aboriginals) and will continue to build upon the November 2010 Summit, *Maximizing Opportunities, Increasing Women's Participation in Science and Engineering*, hosted by NSERC and supported by Engineers Canada and Research In Motion. The PromoScience program aims to hold a competition in 2012-13 to disburse $2.75 million in over 125 grants.

## Program Activity 1.2: Support Students and Fellows

### Program Activity Description

This program activity supports training of highly qualified people through programs of scholarships, fellowships and stipends. Support is provided to students during their research studies at all levels of university enrolment (undergraduate, master's and doctorate level graduate studies, postdoctoral work), providing opportunities for recipients to develop technical and professional skills, and to experience enriched and varied research environments both within Canada and abroad. Scholarship programs aim to ensure that Canada is able to attract, retain and develop a talented, highly skilled workforce. The recipients of scholarship and fellowship awards are selected through peer reviewed national competitions.

**Financial Resources ($ millions)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 141.8 | 141.8 | 141.8 |

**Human Resources (Full-Time Equivalent—FTE)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 32 | 32 | 32 |

| 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. | Average completion rates among NSERC award recipients vs. general NSE student population. | Completion rate 10 percent greater than NSE student population. |
| | Percentage of student population supported through scholarships in the NSE. | Greater or equal to 10% of student population supported. |

## Planning Highlights

**1) Banting Postdoctoral Fellowships:** The Banting Fellowship Program serves to attract the world's top research talent to Canada. The program also increases NSERC's capacity to foster international mobility in research for Canadian researchers. In 2012-13 and beyond, NSERC will work together with the Social Sciences and Humanities Research Council, the Canadian Institutes for Health Research, the Department of Foreign Affairs and International Trade and universities to broaden the program's reach to more of its intended audiences abroad. The Program's Steering Committee has set an overall goal of having thirty percent of applications to the program from foreign candidates.

**2) Collaborative Research and Training Experience Program:** In 2012-13, NSERC will continue to implement the CREATE program, increasing the number of grants toward the planned goal of 120 active grants each year. This steady state is expected to be attained in 2014-15. The expected impacts of this implementation include the development of highly qualified people with professional, job-ready skills and with experience in varied research environments. During the 2012-13 competition, the CREATE program will award up to 20 new grants, of which up to half will feature a formal link with industry.

Furthermore, in 2012-13 NSERC will continue to explore opportunities to align programs that promote student mobility with other countries following the model of a bilateral agreement signed in 2011 with the German Research Foundation (DFG).

## Program Activity 1.3: Attract and Retain Faculty

### Program Activity Description

This program activity aims to attract and retain some of the world's most accomplished and promising researchers for faculty positions in Canadian universities. Chairs are awarded through a competitive peer review process and support faculty positions within post-secondary and research institutions by providing funding for salaries and research activities. Chair holders conduct leading edge research that improves our knowledge and quality of life, strengthens Canada's international competitiveness, and helps train the next generation of highly skilled people. These top researchers serve as magnets to other high calibre researchers and students to come to, or to remain in, Canada. Ultimately this helps to cultivate centers of world class research excellence at Canadian universities, and to brand Canada as a top destination for research.

**Financial Resources ($ millions)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 153.0 | 153.0 | 153.0 |

**Human Resources (Full-Time Equivalent—FTE)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 10 | 10 | 10 |

| Program Activity Expected Results | Performance Indicators | Targets |
|---|---|---|
| Enhanced research capacity in science and engineering. | Number of new, foreign-educated 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

## Planning Highlights

**1) Canada Excellence Research Chairs:** In 2012-13, all of the 13 inaugural Canada Excellence Research Chairs (CERC) in natural sciences and engineering will be working at full capacity, as outlined in their proposals. The adjudication of the Phase 1 applications for 10 new CERC awards announced in Budget 2011 will be completed in 2012-13. Once this is completed, Phase 2 of the competition will be launched.

**2) Canada Research Chairs:** Following the 10th-year evaluation of the Canada Research Chairs (CRC) Program completed in 2010-11, NSERC will continue to work in partnership with CIHR, SSHRC and Canadian academic institutions to maximize the program's impact.

The first internal audit report of the CRC program is expected in mid 2012. The audit report will identify if any risks and inefficiencies exist within the program's processes and, as required, help identify improvements needed to correct them.

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

## Program Activity 2.1: Fund Basic Research

### Program Activity Description

This program activity promotes and enables global excellence in discovery research in Canada. NSERC's discovery based programs support long term, ongoing programs of research as well as shorter term research projects. In addition, NSERC provides substantial and timely additional resources to select researchers in order to accelerate progress and maximize the impact of their research program. Having a solid capacity for basic research across a broad spectrum of natural sciences and engineering disciplines 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 and forms the foundation for training the next generation of scientists and engineers.

**Financial Resources ($ millions)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 366.6 | 368.0 | 368.0 |

**Human Resources (Full-Time Equivalent—FTE)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 56 | 56 | 56 |

| 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 ongoing programs of basic research. | World ranking in number of NSE publications. | Maintain top 10 world ranking (Canada was 7th in 2008[6]). |
| | Percentage of funds spent on training of students and postdoctoral fellows. | 35 percent. |

[6] Observatoire des sciences et des technologies, 2008.

## Planning Highlights

**1) Discovery Grants Program:** NSERC plans to invest $7.2 million of the $15 million provided in Budget 2011 to enhance the Discovery Grants of early career researchers with supplements to their grants. As a result of the 2012-13 national competition, the program aims to award funding to between 250 to 300 early career researchers.

Furthermore, preparations will be made to carry out an evaluation of the Discovery Grants Program which will take place in 2013-14. NSERC will develop the type of evaluation and its scope, including identifying and developing necessary data and statistics in 2012-13.

NSERC will analyze the findings of a Report on Science Performance and Research Funding by the Council of Canadian Academies which is to be published in 2012. NSERC will invite feedback from the research community and will consult with its Committee on Grants and Scholarships. The information will be used to find better ways to compare overall levels of excellence across disciplines according to international best practices, with the goal of devising a new budget allocation methodology to allocate funding between the 12 Evaluation Groups for the Discovery Grants program.

**2) Climate Change and Atmospheric Research**: In 2012-13, NSERC will administer a national competition to award $35 million over the next 5 years in support of Climate Change and Atmospheric Research (CCAR) at Canadian post-secondary institutions. This funding was provided in Budget 2011. The Call for Proposals is expected to be launched in 2012.

Moreover, NSERC will participate in the Belmont Forum, an international group of funding agencies supporting global change and environmental research. The themes selected by the Belmont Forum intersect with areas funded by NSERC through funding for CCAR. This funding will allow Canadian researchers supported by NSERC to collaborate with international researchers in Belmont Challenge projects.

## Program Activity 2.2: Support for Research Equipment and Major Resources

### Program Activity Description

This program activity helps to support the acquisition, maintenance and operation of research equipment and major research resources. Funds are also used to facilitate researchers' access to major and unique research facilities in Canada and abroad. Grants are awarded through a competitive peer review process. This activity is necessary because, in addition to funds to carry out research, top scientists and engineers 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.

**Financial Resources ($ millions)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 37.1 | 23.0 | 23.0 |

**Human Resources (Full-Time Equivalent—FTE)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 10 | 10 | 10 |

| 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 1,000. |
| | Average number of researchers benefiting from a Major Resources Support award. | Greater than 50. |

## Planning Highlights

**1) Research Tools and Instruments Grants:** In 2012-13, NSERC will continue to foster and enhance the discovery, innovation and training capability of university research in the natural sciences and engineering by supporting the purchase of research equipment and installations smaller than those funded by the Canada Foundation for Innovation (CFI) through the Research Tools and Instruments Grants.

**2) Major Resources Support Program:** In 2012-13, NSERC, together with the CFI, will continue to ensure effective operational support of national research facilities To provide more effective client service, NSERC and CFI will collaborate in the oversight and monitoring of successful funding applications under both the CFI's Major Science Initiatives program and NSERC's Major Resources Support program competitions.

# Strategic Outcome 3.0 – Innovation: Knowledge and skills in the natural sciences and engineering are transferred to and used productively by the user sector in Canada

## Program Activity 3.1: Fund Research in Strategic Areas

### Program Activity Description

This program activity funds activities and research projects in selected areas of national importance and in emerging areas that are of potential significance to Canada. To take advantage of Canada's established excellence in research and innovation, and to build capacity in areas that are critical to the Canadian economy, NSERC invests in research areas that have been carefully selected as strategic priorities for the country. These investments support a range of activities such as research projects, networks and workshops. Funded activities share the common goal of connecting researchers with end users in order to strengthen innovation and thus increase Canadian prosperity.

**Financial Resources ($ millions)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 106.6 | 95.8 | 85.5 |

**Human Resources (Full-Time Equivalent—FTE)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 20 | 19 | 18 |

| 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 for the first time (or who have never applied in a specific area). | Five percent. |
| | Percentage of organizations participating in strategic partnerships for the first time. | Increasing trend. |

## Planning Highlights

**1) Strategic Partnerships Programs:** The budget of the Strategic Partnerships Programs is expected to decrease over the next three years, starting in 2012-13, and relative to 2010-11 levels. NSERC will align the delivery of, and communications about the Strategic Partnerships Programs competitions to available resources. NSERC will continue to support international collaboration and exchanges through the Strategic Partnerships Programs by launching concurrent calls for joint research proposals with France, Taiwan and Japan.

**2) Collaborative Health Research Projects:** The Collaborative Health Research Projects is a jointly funded NSERC-Canadian Institutes for Health Research (CIHR) program. NSERC will transfer responsibility for program delivery to CIHR at the end of 2011-12. In 2012-13, NSERC will assist in completing the transition of the administration of the CHRP program to CIHR, ensuring a strong ongoing presence for researchers in the natural sciences and engineering.

The CHRP program will include a reinforced requirement to have at least one user-partner in each proposal. This will ensure a stronger impact on the health system, and will focus projects on efficiencies and use of knowledge to improve the health of Canadians.

## Program Activity 3.2: University-Industry-Government Partnerships

### Program Activity Description

This program activity fosters collaborations between university researchers and industry, as well as other sectors, to develop and transfer new knowledge to Canadian based organizations. A range of industry driven programs aim to stimulate innovation in the Canadian economy and encourage greater science and technology (S&T) investment by the private sector. These partnership programs and projects address real world challenges that are relevant to industry, help build sustainable relationships between the two sectors and connect people and skills.

**Financial Resources ($ millions)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 171.8 | 181.0 | 191.5 |

**Human Resources (Full-Time Equivalent—FTE)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 61 | 62 | 63 |

| 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 | Increase in the number of industrial partners supporting and participating in collaborations with university or college research teams. | Greater than 150 new partners. |
| | Partner satisfaction with research results. | 75 percent of partners indicating satisfaction through final reports and/or follow-up surveys. |
| | Percentage growth in partner contributions. | Greater than 5%. |

NSERC Chairholders Database

## Planning Highlights

**1) Industry Driven Collaborative Research and Development Grants:** Budget 2011 allocated an additional $7.5M in ongoing support that has been invested to fund additional Engage Grants.

In 2012-13 and beyond, NSERC's Regional Offices will continue to focus on working with regional development organizations including in areas of mutual priority; increasing the efficiency and effectiveness of the Engage grants; and increasing awareness of NSERC funding opportunities among faculty at universities, colleges and companies new to NSERC.

**2) Canada-India Research Centre of Excellence:** Budget 2011 announced funding to establish a Canada-India Research Centre of Excellence (CIRCE), as part of the Government of Canada's wider India Engagement Strategy. The CIRCE will help to forge closer ties with India across different sectors and to enhance the bilateral Canada-India relationship. The CIRCE will be overseen by the Network Centres of Excellence (NCE) Steering Committee, which includes participation by Industry Canada, Health Canada, the Social Sciences and Humanities Research Centre, Canadian Institutes for Health Research and Canada Foundation for Innovation. Day-to-day administration of the Program and its initiatives is provided by the NCE Secretariat, which reports administratively to NSERC.

NSERC has launched a competition to fund one CIRCE over five-years. The Centre will foster organization-to-organization level relationships and increase researcher-to-researcher collaborations, forming a network of key individuals and organizations from Canada and India.

The CIRCE will also facilitate knowledge exchange in areas of mutual strategic importance through knowledge and personnel mobilization, research exchanges, networking and partnerships with business and other end users, while building upon established Canada-India collaborations.

**3) International University-Industry Partnerships:** NSERC will implement a joint pilot initiative with the International Science and Technology Partnerships Program Canada (ISTPP) to extend the Canadian academic-industry relationship to include an international connection with China, Brazil and India. Part of this initiative will include work with DFAIT and Natural Resources Canada to develop a joint call for Canada-China collaborative proposals in the area of clean transportation technologies.

## Program Activity 3.3: Support Commercialization

### Program Activity Description

This program activity supports the development of commercially promising technologies and promotes the transfer of knowledge and technologies to Canadian companies for commercialization. Strengthening Canada's record in commercialization is necessary to achieve business growth, job creation and a stronger, more resilient economy. By means of grants awarded through competitive peer review processes, NSERC aims to support the development of pre-competitive technologies and to help build the capacity of Canadian universities and colleges to work with industry and fuel economic growth. Federal investments serve to leverage significant amounts of private funding.

**Financial Resources ($ millions)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 42.9 | 44.1 | 43.9 |

**Human Resources (Full-Time Equivalent—FTE)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 19 | 19 | 19 |

| 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. | Percentage of projects that lead to successful commercialization including the creation of new spin-off companies and licensing agreements. | Greater than 10%. |

| | | |
|---|---|---|
| | A set of nine university commercialization indicators collected by Statistics Canada.[7] | An increase in the majority of the nine indicators. |

## Planning Highlights

**1) College and Community Innovation:** Budget 2011 identified funding to support two new initiatives in the College and Community Innovation Program: the Industrial Research Chairs for Colleges and the College-University Idea to Innovation grants; 2012-13 will be the first complete year for the roll-out of these two new initiatives. The program is managed by NSERC and delivered in collaboration with CIHR and SSHRC.

A summative evaluation of the College and Community Evaluation program is currently underway and will conclude in 2012-13. The evaluation will explore the effectiveness and impact of the program and will help streamline the program to increase its impact on business innovation from applied research at colleges.

**2) NSERC – Idea to Innovation Program:** NSERC will work with CIHR to combine the Idea to Innovation program with CIHR's Proof-of-Principle program to offer a single window of support for post-secondary commercialization efforts. The combined program will be offered for the first time in 2012-13, and will be managed by NSERC in collaboration with CIHR. The harmonization of the programs will also provide an opportunity to optimize current funding tools to the scale and duration of promising commercialization efforts.

**3) Centres of Excellence for Commercialization and Research:** The Centres of Excellence for Commercialization and Research (CECR) program is administered jointly by CIHR, NSERC and SSHRC, in partnership with Industry Canada. The CECR will build upon a recent formative evaluation and a review by the Private Sector Advisory Board to develop criteria for upcoming competitions to maximize the economic, social, health or environmental benefits of the CECRs.

## Program Activity 4.1: Internal Services

### Program Activity Summary

NSERC and SSHRC share internal services for general administration, human resources, finance, awards administration, information management and technology, and audit services. This common administrative services model has proven highly efficient for the two federal granting agencies. In addition, NSERC has its own corporate services to address the agency's

[7] Inventions disclosed, inventions protected, new patent applications, patents issued, total patents held, new licenses, total active licenses, royalties from licensing, and total spin-off companies.

distinct needs in terms of governance, policy, planning, statistics, program evaluation, performance measurement, communications and international relations.

NSERC is working cooperatively with SSHRC, CIHR and CFI in order to improve the coordination of programs, activities and policies. Adopting a more integrated approach to programs and client services helps reduce the administrative burden on researchers and institutions. It also enables the support of crosscutting, multidisciplinary research initiatives designed to address important scientific opportunities and problems that matter to Canadians.

**Financial Resources ($ millions)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 24.0 | 24.1 | 24.1 |

**Human Resources (Full-Time Equivalent—FTE)**

| 2012–13 | 2013–14 | 2014–15 |
|---|---|---|
| 179 | 179 | 179 |

## Planning Highlights

From 2012-13 to 2013-14, NSERC will:

1) **Maximize the results and impact** of federal government investments in research by leveraging relationships with researchers and with communications departments at colleges and universities to increase NSERC's outreach and visibility to the Canadian public. This will be done by leveraging relationships with the media, stakeholders and partners to showcase the impact of research on the lives of Canadians and in Canada's economy.

2) Continue to **identify new opportunities to connect with external audiences.** This will be achieved by:

i. Partnering with other organizations and stakeholders on areas of priority for the government and bringing together researchers and KOLs.

ii. Identifying speaking opportunities that target industry and sector-specific associations to underscore the benefits of NSERC's Strategy for Partnerships and Innovation (SPI) and to showcase the impact and results of government investments in the Strategy for Partnerships and Innovation.

iii. Identifying opportunities to demonstrate the value and impact of NSERC-funded researchers.

3) Continue to **increase its outreach** via social media by producing and posting on the NSERC Web site and Social Media sites videos that promote NSERC funded researchers and demonstrate how their research impacts Canadians.

4) Continue to **develop and practice integrated planning** to support the development of a multi-year strategic plan, an annual corporate plan, annual divisional plans and an annual budget plan.

5) Place **greater emphasis on performance, evaluation and audit/risk** analysis activities to ensure that programs and services are offered in a strategic, coherent and cost-effective manner and support a more results-oriented culture.

6) **Monitor mitigation strategies** identified in NSERC's 2011-2012 Corporate Risk Profile.

7) **Implement the new *Tri-Agency Framework: Responsible Conduct of Research*** with CIHR and SSHRC, including the already established Secretariat and Panel on the Responsible Conduct of Research.

8) Revise and update the tri-agency **Memorandum of Understanding on the Roles and Responsibilities in the Management of Federal Grants and Awards,** for implementation by winter 2012.

9) Work in collaboration with CIHR and SSHRC to develop a **policy on access to research outputs.**

# Section III: Supplementary Information

## Financial Highlights

The future-oriented financial highlights presented within this Report on Plans and Priorities are intended to serve as a general overview of NSERC's financial position and operations. These financial highlights are prepared on an accrual basis to strengthen accountability and improve transparency and financial management.

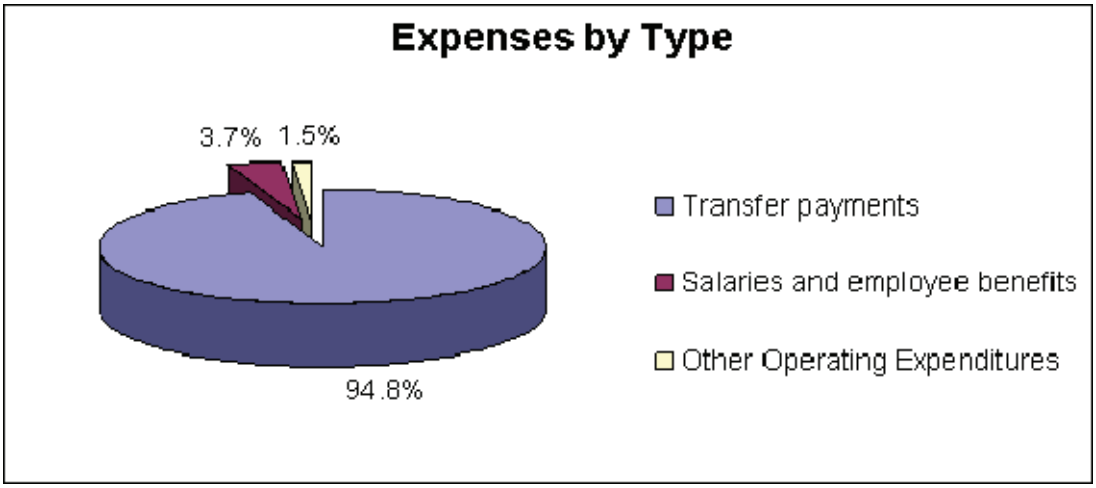
The Future-oriented financial statement can be found on NSERC's website at: http://www.nserc-crsng.gc.ca/NSERC-CRSNG/Reports-Rapports/plans-plans_eng.asp

**Future-Oriented Condensed Statement of Operations**

For the Year (ended March 31)

**($ millions)**

| | $ Change | Future-Oriented 2012-13 | Future-Oriented 2011-12 |
|---|---|---|---|
| **Total Expenses** | -17.7 | 1,056.7 | 1,074.4 |
| **Total Revenues** | - | - | - |
| **Net Cost of Operations** | -17.7 | 1,056.7 | 1,074.4 |




Total expenses are projected to be $1,056.7 million in fiscal year 2012-13. The majority of these expenses are for transfer payments ($1,001 million) in the form of grants and scholarships related to departmental programs. The balance of spending is made up of salaries and employee benefits ($39.3 million) and other operating expenses ($16 million). The latter two types of expenses are required to support departmental programs and other corporate obligations.

**Condensed Statement of Financial Position**
For the Year (ended March 31)
**($ millions)**

| | $ Change | Future-Oriented 2012-13 | Future-Oriented* 2011-12 |
|---|---|---|---|
| **Total assets** | - | 9.1 | - |
| **Total liabilities** | - | 8.3 | - |
| **Equity** | - | 0.8 | - |
| Total | - | 9.1 | - |

* No Future-Oriented statement of financial position was prepared in the 2011-12 Report on Plans and Priorities.

## List of Supplementary Information Tables

All electronic supplementary information tables found in the *2012–13 Reports on Plans and Priorities* can be found on the Treasury Board of Canada Secretariat website.

- Details on Transfer Payment Programs;
- Greening Government Operations;
- Upcoming Internal Audits and Evaluations over the next three fiscal years.

# Section IV: Other Items of Interest

## Organizational Contact Information

**Barney Laciak**
**Manager, Corporate Planning and Reporting**
Natural Sciences and Engineering Research Council of Canada
350 Albert St.
Ottawa, Ontario K1A 1H5
Canada
Telephone: 613-996-1079
E-mail: Barney.Laciak@nserc-crsng.gc.ca