

**Performance Measurement Strategy for the
Class Grants Program for Centres of Excellence for Commercialization and
Research (CECR Program)**

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June 2013

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List of acronyms

BL-NCE	Business-Led Networks of Centres of Excellence
CECR	Centres of Excellence for Commercialization and Research
CFI	Canada Foundation for Innovation
CIHR	Canadian Institutes of Health Research
HQP	Highly qualified personnel
IP	Intellectual property
IRDI	Industrial R&D Internship program
LOI	Letter of Intent
NCE	Networks of Centres of Excellence
NSERC	Natural Sciences and Engineering Research Council
SSHRC	Social Sciences and Humanities Research Council
OECD	Organisation for Economic Co-operation and Development
PAA	Program Activity Architecture
PMS	Performance measurement strategy
PSAB	Private Sector Advisory Board
R&D	Research and development
S&T	Science and technology
STIC	Science, Technology and Innovation Council
TTO	Technology transfer offices
UILO	University industry liaison office

1 Program Profile

1.1 Need for program

Science and technology (S&T) plays a key role helping Canadians address pressing societal and economic challenges. S&T also supports business innovation, enabling economies to improve their long-term productivity and competitiveness, and in so doing supporting a higher standard of living and quality of life. Canadian private-sector investment in research and development and demand for highly skilled workers are low compared to other OECD countries. Improving Canada's performance in this regard may contribute to stronger productivity and enhance economic growth.

Budget 2007 announced a broad range of early actions in support of the S&T Strategy, including three new programs to leverage Canada's strong public-sector research base to the benefit of business research and innovation: the Centres of Excellence for Commercialization and Research (CECR), Business-Led Networks of Centres of Excellence (BL-NCE), and Industrial R&D Internship (IRDI) programs. All three programs are intended to increase private-sector investments in research in Canada, support the training of skilled researchers, and connect the resulting ideas and talent to businesses seeking to bring innovations to market.

The CECR program is a federal mechanism to support the operation of research and commercialization centres that bring together people, services and research infrastructure to position Canada at the forefront of breakthrough innovations in priority areas. The program was established to create internationally recognized centres of excellence that will deliver economic, social, health and environmental benefits to Canadians. Centres are initially funded over a period of five years. Some centres may receive additional funds or have their funding period extended. Three competitions for new centres have been completed since the beginning of the program, and 21 centres are now active. Following a formative evaluation¹ of the program done in 2009, a management response was developed and recommendations from the evaluation were implemented. In 2012, the program ended its first five years of operations. The program has undergone a summative evaluation, based on an analysis of the funded centres during that period. Results of this evaluation have demonstrated that the program is progressing towards reaching the objectives set in the first five-year phase, and the continued relevance and effectiveness and need of the program. These evaluation results also point to the need to continue the program to support innovation and commercialization of research results.

The program is now entering its second phase of operation under amended terms and conditions (2012). The new Performance Measurement Strategy (PMS) proposed follows the Treasury Board (TB) guidelines², and is aligned with the amended CECR terms and conditions. It is understood that the PMS should be reviewed periodically and revised (if required) to maintain its relevance. The proposed PMS will be revised, based on the findings of the summative evaluation

¹ http://www.nce-rce.gc.ca/ReportsPublications-RapportsPublications/ProgramEvaluations-EvaluationsProgrammes_eng.asp

² <http://www.tbs-sct.gc.ca/cee/dpms-esmr/dpms-esmr02-eng.asp>

which will provide recommendations on changes to the performance measures used in the first years of the program

1.2 Alignment with Government Priorities

The goal of the CECR program is to create internationally recognized centres of excellence in research and commercialization in areas of priority to the Government of Canada in order to deliver economic, social, health and environmental benefits to Canadians.

Three competitions were held since the creation of the program in 2007 leading to the funding of 22 centres in the four priority areas of the 2007 S&T strategy: environmental sciences and technologies; natural resources and energy; health and related life sciences and technologies; and information and communications technologies. These centres operate in areas under the jurisdiction of all three federal granting agencies. The CECR program is part of the federal agencies' strategic planning and reporting system, and included in their respective Program Activity Architecture (PAA). Each of the granting agencies reports on CECR-related activities and results in areas under its own jurisdiction.

Centres selected in future competitions will continue to be aligned with the areas of priority for the Government of Canada.

1.3 Target Populations

Primary target populations are innovative researchers and entrepreneurs, public and private-sector organizations that the government aims to mobilize to achieve the expected results of the CECR program, as well as Canadians who will benefit from the results and economic activity arising from the centres. Organizations eligible to receive CECR funds are not-for-profit corporations created by universities, colleges, not-for-profit research organizations, firms and other interested non-government parties.

1.4 Stakeholders

Important stakeholders are academic institutions and research-intensive firms working in the areas of priority for the Government of Canada, provincial and other federal departments, the private sector, and non-governmental organizations that collaborate with, and contribute to the centres. The Government of Canada is another stakeholder given the significant role played by the CECR program within its Science and Technology Strategy as well as within the various activities of the Industry Canada portfolio. The Canadian public can also be considered as a stakeholder since the program results have important impacts on the economy and on the quality of life of Canadians.

1.5 Governance

The CECR Program is overseen by a tri-agency NCE Steering Committee made up of the Deputy Minister of Industry Canada (or delegate), the Deputy Minister of Health Canada (or delegate), the Presidents of the three granting agencies - the Canadian Institutes of Health Research (CIHR), Natural Sciences and Engineering Research Council (NSERC) and Social Sciences and Humanities Research Council (SSHRC), and the President of the Canada Foundation for Innovation (CFI) as an observer.

Day-to-day administration of the CECR program is provided by the Networks of Centres of Excellence Secretariat (NCE Secretariat). Given the multi-disciplinary nature of the centres, funding for a given centre may flow through more than one granting agency, and so the NCE Secretariat will be the primary point of interaction for the centre throughout the duration of the award.

A Private Sector Advisory Board (PSAB) has been created to provide advice on the operations and performance of the program and assist with the selection and performance assessment of centres.

The NCE Secretariat runs periodic national competitions through which the Steering Committee selects successful centres on the recommendation of the PSAB and international peer review panels charged with review of proposals.

1.6 Resources

The total financial resources for the CECR program for the five-year period from fiscal years 2012-13 to 2016-2017 are \$150 million. Program funding is intended to support the operating and commercialization costs of funded centres and complement other sources of funding from the public and private sectors.

Table 1: Financial resources for the CECR program

	Fiscal year 2012-2013	Fiscal year 2013-2014	Fiscal year 2014-2015	Fiscal year 2015-2016	Fiscal year 2016-2017
Unallocated Grants	\$28,985,125	\$28,985,125	\$28,985,125	\$28,985,125	\$28,985,125
CECR Administration	\$1,014,875	\$1,014,875	\$1,014,875	\$1,014,875	\$1,014,875
Total CECR	\$30,000,000	\$30,000,000	\$30,000,000	\$30,000,000	\$30,000,000

2 Logic Model

2.1 Program Objectives

The goal of the CECR program is to create internationally recognized centres of excellence in research and commercialization in the areas of priority for the Government of Canada to deliver economic, social, health and environmental benefits to Canadians.

2.2 Expected Results

The program's goal is to build on existing infrastructure, networks and resources to enhance capacity by investing in a portfolio of research and commercialization centres that yield the following benefits:

- Brand Canada as the host of internationally recognized centres of excellence that will yield economic, social, health or environmental benefits to Canadians;
- Draw on existing research and commercialization strength, infrastructure, networks and funding capacity to enhance their impact;
- Attract, retain and provide training to highly qualified personnel (including internationally recognized business leaders);
- Open up new opportunities for Canadian researchers and firms to access world-class equipment, facilities and networks;
- Create, grow and retain companies in Canada that are able to capture new markets with breakthrough innovations;
- Accelerate the commercialization of leading-edge technologies, goods, services in priority areas where Canada can significantly advance its competitive advantage;
- Attract investment (including foreign direct and venture capital investments); and
- Strengthen domestic collaboration and ensure that benefits spill over to a wide array of firms, organizations, sectors and regions of the country.

Centres will be expected to become self-sufficient in a reasonable period by the establishment of strong partnerships and execution of a strong business plan.

These results are graphically depicted in the logic model and listed in the PMS in subsequent sections of this document where they are grouped in chronological order. Although many of these results are expected to occur over the course of the award, the longer term outcomes can occur years after the end of the funding period due to their complexity.

2.3 Logic Model

The logic model identifies the linkages between the activities of a program and its ultimate objectives. It delineates the set of activities that make up the program and the sequence of outcomes that are expected to flow from these activities. As such, the logic model serves as a "roadmap," showing the chain of results connecting activities to the ultimate outcomes, and thus, identifies the steps that will demonstrate progress towards achievement of the program's goals and objectives. Four levels of performance are delineated in the logic model presented in Figure 1: activities and outputs, immediate outcomes, intermediate outcomes and ultimate outcomes.

Activities and Outputs

These outline the specific activities conducted by NCE Secretariat staff to deliver the program and the outputs that are produced from these activities. The activities and outputs are entirely within the control of the Secretariat, and program managers are directly accountable for them.

One of the most important activities of the Secretariat is to administer the selection process of new centres and the adjudication of requests from on-going centres for an extension to their funding or their funding period. The process is detailed below.

Selection process: the NCE Secretariat employs a rigorous competitive process based on a two-stage peer-review process. To ensure delivery of results and benefits expected from the funded centres, the review process is based on three overarching selection criteria: outlined below:

I. Criteria 1: Benefits to Canada

- The extent to which the centre's research and commercialization activities address issues of high priority for Canada;
- The likelihood that the centre will create sufficient scale and focus to brand Canada as the host of an internationally recognized centre of excellence in its area of priority;
- Evidence that the centre will help accelerate the commercialization of leading edge technologies, goods, services in priority areas where Canada can significantly advance its competitive advantage.

II. Criteria 2: Track Record and Potential of the Applicants

- The achievements of the applicants and their ability to contribute to the centre's research and commercialization objectives;
- The ability of the applicants to attract investment sufficient to meet the program matching requirements and to encourage investment in partner firms.
- The ability of the applicants to support partners, firms and researchers with advice, analysis, training and business services to advance their commercialization objectives.

III. Criteria 3: Business Plan

This criterion will be assessed based on the updated Corporate Plan and the Business Plan where applicable.

- Excellence, focus and coherence of the research and development, and commercialization program;
- The effectiveness of the plan to manage, protect and exploit intellectual property resulting from centre-funded innovation;
- A credible demonstration of how this investment will result in the creation of a self-sustaining, productive centre of excellence;
- The quality of the proposed organizational structure with appropriate representation on the Board of Directors and management team to achieve its objectives;
- Evidence that the applicants have in place an accountability framework likely to result in effective leadership, sound financial planning and decision-making.

Stage 1 - Letter of Intent: All applicants are asked to submit a Letter of Intent (LOI) that describes the preliminary elements of the proposed centre. LOIs serve to identify centres interested to apply and the specific expertise needed for the review. Ongoing centres applying for extension are all invited to submit a full application. LOIs submitted by new centres are reviewed by the PSAB against the program selection criteria and competition framework, and a short list is provided to the NCE Management or Steering Committees for approval. Only the approved LOIs will be invited to submit a full application.

Stage 2 - Full Application: Centres included in the approved short-list will be invited to submit a full application which may consist of the following:

- A robust business plan addressing the CECR program objectives (including a proposed budget). Applications for extended funding must send a revised corporate plan.
- A description of the achievements of the applicants and their ability to contribute to the centre's research and commercialization objectives.
- Letters of support and/or summary of contributions the applicants secured from partner organizations.

Applications for new or extended funding will undergo review by an Expert Panel established by the NCE Secretariat, comprised of domestic and international experts, who will meet with applicants, and produce in-depth written assessment reports based on the review criteria. The PSAB will review all the proposals, taking into consideration the Expert Panel reports. Centres failing to be endorsed by Expert Panels will not be recommended for funding. PSAB will provide comments on each proposal and a ranked list of centres recommended for new or additional funding. As well as a grant amount and duration for each centre, based on the quality of the proposal with regard to all program criteria. PSAB will also review and make recommendations to the NCE Steering Committee on all requests for extension of existing Funding Agreements. The NCE Steering Committee will make the final funding decision.

Following NCE Steering Committee approval, the NCE Secretariat, with the collaboration of the granting agencies, will prepare an integrated submission to the TB for approval to appropriate the required funds to the relevant granting agencies. Due to the multi-disciplinary nature of the centres, funding for a given centre may come from more than one granting agency, and the NCE Secretariat will be the primary point of interaction for all centre applicants throughout the grant period. Funding will be managed by the NCE Secretariat and disbursed to the recipient(s) against a funding agreement under the legal authority of the relevant granting agency(ies).

Other essential activities of the program are:

- Integrated program delivery and management, e.g. signing of Funding Agreements with selected centres, developing guidance manuals, and providing advice and directions to ongoing centres.
- Monitoring and evaluation: annual reports provided by centres (details in section 3). Program evaluations are done every five years (details in section 4).

Immediate Outcomes

Immediate outcomes occur as a result of the activities and outputs produced by centres. These outcomes are controlled by the target population, and as such, can only be influenced by the NCE Secretariat. They are expected to occur in the first years after the start of the CECR funding to the centre. Immediate outcomes include:

- enhanced research and commercialization capacity that draws on existing research and commercialization strength, infrastructure, networks and funding;
- contributions in cash and in-kind from partners from all sectors;

- attraction and retention of highly qualified personnel (including national and international business leaders); and
- training opportunities.

Intermediate Outcomes

Intermediate outcomes occur as a result of the immediate outcomes. They are less under the influence of the NCE Secretariat and are subject to external factors. Although they are particular to each centre, they should contribute to the achievement of the intermediate results of the program leading to the achievements of the ultimate outcomes. These outcomes should be reached before the end of the centre funding cycle. Intermediate outcomes include:

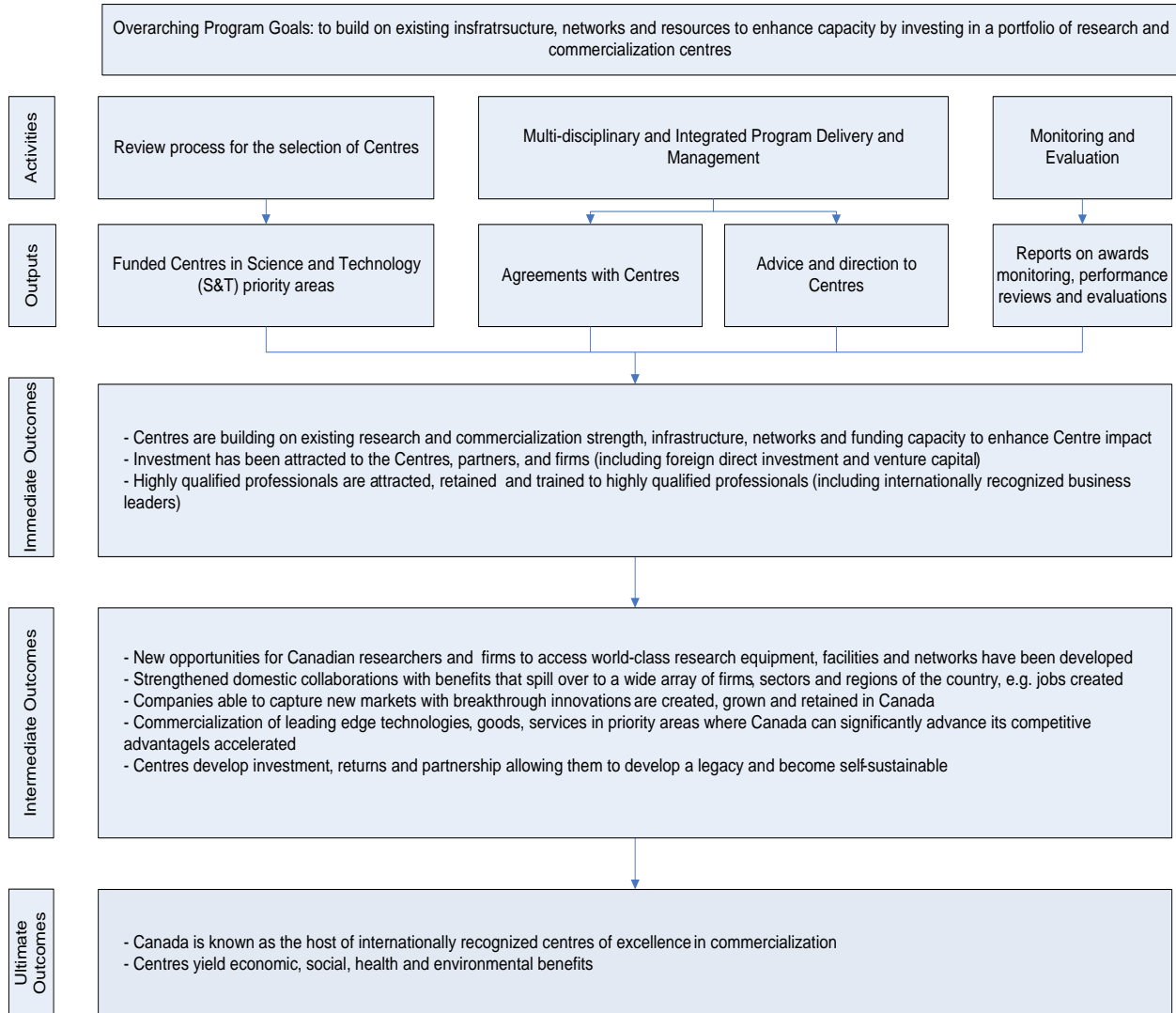
- attraction of national and foreign investment in the centre and the firms served by the centre;
- new opportunities for Canadian researchers and firms to access world-class research equipment, facilities and networks;
- establishing new domestic collaborations with benefits that spill over to a wide array of firms, sectors and regions of the country;
- creation, growth and retention of companies in Canada that are able to capture new markets with breakthrough innovations;
- jobs created in centres and companies; and
- development of investments, returns and partnership allowing centres to develop a legacy and become self-sufficient by the end of the funding period.

Ultimate Outcomes

Ultimate outcomes are the external consequences that the intermediate outcomes contribute to and reflect the rationale for the program. They represent a long-term vision which the centres contribute to, and are generally independent of the centre's type and specific objectives. As such, ultimate outcomes are usually difficult to measure, because their long-term nature and other mitigating factors often influence their attainment. Together, the centres ultimate outcomes in research and commercialization will contribute to the program's overall ultimate outcomes: namely,

- to brand Canada as the host of internationally recognized centres of excellence, and
- to yield economic, social, health and environmental benefits to Canadians.

Figure 1: Logic Model for the CECR program



3 Performance Measurement Strategy Framework

3.1 Performance Measurement Strategy Framework

Ongoing performance measurement refers to the systematic collection of information for monitoring how a program is performing at any given point in time. It can be used to report on the level of attainment of planned results and performance trends over time. The key focus of the performance measurement strategy is to establish what indicators will be used to measure progress towards outputs, outcomes, and how, when and by whom information on these indicators will be collected.

The implementation of performance indicators will require careful planning including an analysis of the resources, skills, roles and responsibilities and priority for indicators relative to ongoing policy and program implementation demands.

The initial strategy for the CECR program had been developed during the design phase of the program and reflects the program structure at that time. The formative evaluation suggested a review of the PMS. This section presents a revised PMS for which reflects changes in the T&Cs of the program. The proposed PMS will be reviewed as it is implemented, and changes made to reflect new program orientations or delivery mechanisms. Data collection methods used will be refined as needed to provide more streamlined information or to include useful missing information. Performance indicators are presented in Table 2

As recommended by the *Guide to Developing Performance Measurement Strategies* (Treasury Board of Canada, 2010), baselines, targets and timelines will be developed and inserted in the PMS. They can be obtained from:

- baseline data based on past performance or previous iterations of the program;
- business plans and reports on achievements of the first centres;
- similar programs that are considered leaders in the field (benchmarking);
- generally accepted industry or business standards; and
- publicly stated targets (e.g. set by the government, the federal budget).

Table 2: Performance Measurement Strategy Framework for the CECR program

Program Outputs and Outcomes	Indicators	Data Sources/Data Collection Methods	Responsibility for Data Collection / Data Management System	Timing/ Frequency of Data Collection
Outputs				
Funded centres	Funded centres (number, geographic distribution, government priority areas)	Selection Committee reports/Steering Committee recommendations, NCE, and funding agencies databases	NCE Secretariat NCE database	Every competition year
	Funding awards (number, amount, duration)	Selection Committee reports/Steering Committee recommendations	NCE Secretariat NCE database	Every competition year
Agreements with centres	Nature and number of Funding Agreements	Funding and agreements with centres	NCE Secretariat NCE files	Every competition year
Advice and direction to centres	Nature and quality of advice and direction provided	Interviews/survey of centre staff, partners and firms	NSERC/SSHRC evaluation	Summative evaluation (2015-2016)
Reports on awards monitoring, performance reviews and evaluations	Number of participants, partners, amount of contributions and expenditures	NCE database, statistical reports	NCE Secretariat NCE database	Every competition year
Immediate Outcomes				
Centres are building on existing research strength, infrastructure, networks and funding sources to enhance centre impact	Number and type of infrastructure, networks and funding sources levered by centres	Annual progress report	NCE Secretariat NCE database	Annually
	Number, type, sector and size of centre partner organisations	Annual progress report	NCE Secretariat NCE database	Annually
	Amount and sources of cash and in-kind contributions	Annual progress report	NCE Secretariat NCE database	Annually
Investment attracted to centre, partner and firms (including foreign direct investment and venture capital)	Investment in centres (amounts invested, type and country of investor)	Annual progress report	NCE Secretariat NCE database	Annually
	Investment in centre partners and served firms (amounts, type and country of investor)	Annual progress report	NCE Secretariat NCE database	Annually
	Importance of the centre in decision to	Interviews/survey of centre partners and	NSERC/SSHRC evaluation	Summative evaluation

Program Outputs and Outcomes	Indicators	Data Sources/Data Collection Methods	Responsibility for Data Collection / Data Management System	Timing/ Frequency of Data Collection
	invest in Canada	firms		(2015-2016)
Highly qualified personnel are attracted, retained and provided with training (including internationally recognized business leaders)	Training provided to post-graduate and postdoctoral trainees (number, type, nature, duration)	Annual progress report	NCE Secretariat NCE database	Annually
	Opinion of trainees (post-graduate students and post-doctoral researchers)	Interviews/survey of centre HQP, partners and firms	NSERC/SSHRC evaluation	Summative evaluation (2015-2016)
	Number of top business leaders (domestic and international) participating in centres and retained	Annual progress report	NCE Secretariat NCE database	Annually
	Importance of the centre in decision to come/stay in Canada	Interviews/survey of centre HQP, partners and firms	NSERC/SSHRC evaluation	Summative evaluation (2015-2016)
Intermediate Outcomes				
New opportunities for Canadian innovators to access world-class research equipment, facilities and networks have been developed	Number, type of research equipment, and facilities or networks accessed	Annual progress report	NCE Secretariat NCE database	Annually
	Nature and extent of use by Canadian innovators	Annual progress report	NCE Secretariat NCE database	Annually
Strengthened domestic collaboration and ensure that benefits spill over to a wide array of firms, organizations, sectors and regions of the country	Number and type of partnerships and collaborations established by centre activities	Annual progress report	NCE Secretariat	Annually
	Benefits to firms, organisations, sector and regions (increased activity, sales, jobs created)	Annual progress report	NCE Secretariat NCE database	Annually
		Interviews/survey of centre partners and firms	NSERC/SSHRC evaluation	Summative evaluation (2015-2016)
Companies able to capture new markets with breakthrough innovations are	Number of companies created, grown and retained	Annual progress report	NCE Secretariat NCE database	Annually
		Interviews/survey of companies	NSERC/SSHRC evaluation	Summative evaluation (2015-2016)

Program Outputs and Outcomes	Indicators	Data Sources/Data Collection Methods	Responsibility for Data Collection / Data Management System	Timing/ Frequency of Data Collection
created, grown and retained in Canada	Number and nature of breakthrough innovations and benefits to companies (e.g. cost-savings, new products and processes)	Annual progress report	NCE Secretariat NCE database	Annually
	Number and nature of market outcomes (e.g. increased market share or new markets accessed)	Interviews/survey of centre partners and firms	NSERC/SSHRC evaluation	Summative evaluation (2015-2016)
Commercialization of leading edge technologies, goods, services in priority areas where Canada can significantly advance its competitive advantage accelerated	Number and type of technologies, processes, goods or services commercialized or put into practice by centre partners	Annual progress reports	NCE Secretariat NCE database	Annually
	Opinion of key informants on accelerated commercialization (or changes in practices) with help of centre	Interviews/survey of centre partners and firms	NSERC/SSHRC evaluation	Every five years
	Extent to which centre partners have advanced their competitive advantage	Interviews/survey of centre partners and firms	NSERC/SSHRC evaluation	Summative evaluation (2015-2016)
Centres develop investment, returns and partnership allowing them to develop a legacy and become self-sustainable	Number of centres operating with a viable business plan	Survey of centre	NSERC/SSHRC evaluation	Summative evaluation (2015-2016)
		Final reports	Extended centres	Periodically (end of grant)
Ultimate Outcomes				
Canada known as the host of internationally recognized centres of excellence in commercialisation	Number and nature of recognition (national and international) of program and/or centres (e.g. media, awards)	Annual progress reports	NCE Secretariat NCE database	Annually
		Interviews/survey of centre partners and firms	NSERC/SSHRC evaluation	Summative evaluation (2015-2016)
Centres yield economic, social	Economic, social, health and	Annual progress reports	NCE Secretariat NCE database	Annually

Program Outputs and Outcomes	Indicators	Data Sources/Data Collection Methods	Responsibility for Data Collection / Data Management System	Timing/ Frequency of Data Collection
health and environmental benefits	environmental, benefits resulting from centres	Interviews/survey of centre partners and firms	NSERC/SSHRC evaluation	Summative evaluation (2015-2016)

3.2 Accountabilities and Reporting

The CECR program receives its funding through parliamentary appropriations and has a responsibility to Parliament and to Canadian taxpayers to ensure that the funds entrusted to it are well managed and used effectively and economically. Granting agencies share this responsibility and include the CECR program in their reports to Parliament.

The monitoring of CECR grants is an ongoing function of the NCE Secretariat to ensure that funds are used effectively to attain the expected results. These monitoring activities are linked to ongoing performance measures, and the data collected also feed into program evaluations. Program evaluations are required every five years, and make use of ongoing performance monitoring data provided by the Secretariat as well as data provided by the centres. The Program Evaluation Strategy is described in the next section. The table below provides details on performance reporting for the CECR program.

Table 3: CECR Program Performance Reporting

Type of Report	Purpose	Contents	Frequency of Use/ Timing	Responsibility
Departmental Performance Report	Reporting to Parliament on CECR program's outcomes	Granting agencies funding received for the CECR programs	Annual	Each of the participating granting agencies
NCE Annual Report (includes CECR Program)	Reporting to NCE Steering and the public on the CECR programs activities and outcomes	Summary of financial, statistical and outcomes and achievements	Annual	NCE Secretariat
Centre annual reports	Reporting to the NCE Secretariat and the member organizations	Performance and audited financial statements	Annual	CECR

Robust controls are built into NCE Secretariat's systems and processes. They include clear assignments of responsibility and authority for the approval of grants, budget controls embedded in the NCE grants management database, and multi-faceted monitoring of ongoing grants. Financial controls, which are carried out by the Finance Division (Review and Investigations),

within the Common Administrative Services Directorate at NSERC/SSHRC³ and by the Finance Division at CIHR, are reviewed and modified as needed.

Frameworks for ongoing monitoring of expenditures are in place, as described in detail in the *Tri-Agency Financial Administration Guide*. As specified in the guide, representatives of the granting agencies will visit academic institutions and affiliated centres, periodically to:

- assess whether grantees have the necessary financial/administrative tools to properly and effectively manage their research funds;
- review the effectiveness of procedures, systems and controls in place at the institution to ensure that the granting agencies' policies and requirements are followed;
- review expenditures from grant accounts to ensure that these were made in accordance with the established policies, requirements and guidelines and for the broad purpose intended; and
- share and disseminate information on guidelines and expectations for financial accountability and integrity.

For centres not affiliated with academic institutions, the financial monitoring procedure described above is adapted to reflect the organizational context. In addition, each centre has a Board of Directors that has the overall responsibility for the management, direction, and financial accountability of the centre, including the approval of the audited financial statements and annual reports provided to the NCE Secretariat. Finally, the centre's activities are subject to general overview and monitoring by the NCE Steering Committee through the NCE Secretariat. An NCE Secretariat staff person sits on each centre's Board of Directors, thus monitoring compliance of the program's policies and procedures.

Each participating granting agency has its own internal audit function; however, program funding administered by the NCE Secretariat falls under the purview of NSERC's internal audit function. NSERC's internal audit function supports the agency's efforts to achieve its corporate objectives, through its independent assessment of NSERC's internal management framework and by providing senior management with assurance regarding its risk management, internal controls, and governance practices, including, but not limited to NSERC's core granting programs. The Auditor General of Canada is NSERC's external auditor and is responsible for conducting an external audit of NSERC's financial statements. Over the years, the Auditor General has consistently rendered an unqualified opinion regarding the agency's and NCE's financial statements.

Recipients are asked to provide annual progress reports to the NCE Secretariat. These reports will be used to determine whether grants are being used for the intended purpose and to monitor centre performance. Feedback is provided to centres on their annual reports. The PSAB will also be asked to comment on the centre's annual performance.

³ NSERC and SSHRC share common administrative services such as the Financial Division, which oversees financial visits for both agencies and the NCE Secretariat.

The NCE Secretariat is responsible for providing consolidated reports on the overall impact of the program. The NCE Secretariat compiles, revises and analyses the performance data provided by the centres on a yearly basis and reports on the CECR program in the annual public report posted in its Web site.

Recipients send progress reports electronically, making data capture and analysis relatively easy and timely, two important features of any good performance measurement system. Reporting requirements are provided to the centres annually. A web reporting system is being developed.

Whenever possible, program data and statistics that are either already available or that can be collected using a file review method will be used. These data sources include survey results or statistics on target population. Data integrity for this type of performance information largely depends on the methods used to collect it by the organizations providing it.

The data sources and collection methods identified in the PMS table constitute multiple lines of evidence that can be used to gather the appropriate information for each indicator. Each of these data sources and collection methods is described in this section. Note that data for some indicators will also be collected within the course of evaluation activities; the data sources more appropriate to evaluation are described in the next section.

The NCE Secretariat maintains a database that stores information necessary to manage and monitor the life cycle of the granting processes, such as information relating to the receipt of the initial application, peer review, final approval, and financial monitoring of grants and information on grantees. The Secretariat database is an invaluable source of information for ongoing performance management, since reports can be developed and generated with updated information when necessary. Information related to the portion of the grant attributable to each of the three granting agencies is also reported in its own respective database.

Measures to ensure data integrity are built into the input process managed by program and agency staff. Data integrity for annual progress reports is based on the quality of the information provided by the centres. The validity of the reporting instruments will be also monitored and any required clarifications will be made to ensure that the questions structuring the reports are clear and unambiguous. The 2012 summative evaluation has made recommendations to review the PMS, the annual reporting and the data collection method. These recommendations will be implemented as indicated in the NCE Management Response.

4 Evaluation Strategy

As a tri-agency program, the evaluation of the CECR program is overseen by the Interagency Evaluation Steering committee, which is comprised of the Heads of Evaluation of CIHR, NSERC and SSHRC, and a representative of Industry Canada. The CECR program will be evaluated every five years in accordance with the *Financial Administration Act* to meet the information needs of deputy heads and inform program renewal. The next summative evaluation is scheduled for fiscal year 2015-2016.

A formative evaluation, completed in 2009, looked specifically at the implementation of the program data gathering strategy, design and delivery issues. A summative evaluation, completed in 2012, served to inform program renewal and improve program delivery. Based on recommendations from these evaluations, modifications deemed necessary were implemented.

The draft evaluation strategy is presented in Table 4. The framework outlines the proposed evaluation questions as well as the data sources and data collection methods required to address these questions. The questions presented in the framework address the information needs of the Deputy Heads and the core evaluation issues (i.e. relevance and performance) outlined in the Policy on Evaluation. The proposed evaluation questions will be reviewed and modified, if necessary, prior to undertaking the next evaluation.

As with the performance measurement strategy, the evaluation strategy requires the identification of specific data requirements for each of the evaluation questions. These data requirements, or indicators, can be based on indicators in the performance measurement strategy or can be specific to one evaluation question. The strategy identifies the indicators specific for each evaluation question, as well as data sources and collection methods, and the timeline for data collection. Some the evaluation issues will be measured in part by the indicators identified in the PMS. To avoid duplication, the table below displays the indicators that will be measured through evaluation activities only. It is understood that the data collected on an ongoing basis will also be used to answer evaluation questions.

It should be noted that the centres funded by the CECR program are quite diverse with respect to the commercialization model used, scope of the knowledge or technology generated, the sectors and markets, and the partners, clients and end-users reached by the funded centres. As a result, the proposed indicators and data collection methods have been designed in such a way to accommodate the variability across centres.

Table 4: Evaluation Strategy for the CECR program

Issue / Question	Indicators	Data Collection Methods and Source	Timelines for Data Collection
Relevance			
1. To what extent is there a continued need for funding to support the operation of	1. Assessment of the overall need for a centre approach to support research, development, innovation and commercialization	<ul style="list-style-type: none"> ▪ Document review (CECR program documents, federal government documents, literature) 	Summative evaluation (2015-2016)

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commercialization centres?	2. Assessment of specific/unique needs addressed by the program (e.g. needs of partners, stakeholders and user community)	<ul style="list-style-type: none"> on other commercialization programs in Canada) <ul style="list-style-type: none"> ▪ Key informant interviews (NCE management, federal granting agency representatives, Industry Canada representative, PSAB members, expert review panel members, applicants from non-funded full applications, provincial government representatives, TTO/ILO representatives) ▪ Case studies (Interviews with centre management and partners, survey of centre partners) 	
2. Is there a necessary role for the federal government in providing the program?	<ol style="list-style-type: none"> 1. Assessment of the federal government's role and responsibilities in delivering the program 2. Nature and extent of provincial government participation in and support of centre activities 	<ul style="list-style-type: none"> ▪ Document review (CECR program documents, federal government documents, literature on other commercialization programs in Canada) <ul style="list-style-type: none"> ▪ Key informant interviews (NCE management, federal granting agency representatives, Industry Canada representative, PSAB members, provincial government representatives) ▪ Case studies (Interviews with centre management and partners) 	Summative evaluation (2015-2016)
3. To what extent is the program aligned with federal	1. Assessment of the alignment of program objectives with federal government priorities in	<ul style="list-style-type: none"> ▪ Document review (CECR program documents, federal government 	Summative evaluation (2015-2016)

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government priorities?	<p>S&T and commercialization (e.g. S&T strategy priorities, STIC sub-priorities)</p> <p>2. Assessment of the alignment of centre plans and activities with federal government priorities in S&T and commercialization (e.g. S&T strategy priorities, STIC sub-priorities)</p>	<p>documents)</p> <ul style="list-style-type: none"> ▪ File review (letters of intent, full applications, corporate plans, annual reports) ▪ Key informant interviews (NCE management, federal granting agency representatives, Industry Canada representative, PSAB members, expert review panel members) ▪ Case studies (Interviews with centre management and partners) 	
Performance: Effectiveness, efficiency and economy			
4. To what extent has the program achieved expected outcomes?	<p>1. Assessment of actual program performance against expected outcomes based on centres funded to date</p> <p>2. Assessment of incrementality and attribution of CECR program funding to the achievement of expected outcomes</p> <p>3. Evidence of unintended outcomes (positive or negative)</p>	<ul style="list-style-type: none"> ▪ Document review (CECR program documents, federal government documents, literature on other commercialization programs in Canada) ▪ File review (corporate plans, annual reports) ▪ Key informant interviews (NCE management, federal granting agency representatives, Industry Canada representative, PSAB members, expert review panel members, provincial government representatives) ▪ Case studies (Interviews with centre management and partners, survey of centre partners) 	Summative evaluation (2015-2016)
4.1. Draw on existing	1. Source, type (cash and in-kind) and amount of	<ul style="list-style-type: none"> ▪ Document review (CECR program 	Summative evaluation (2015-2016)

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<p>research and commercialization capacity and strengthen domestic collaborations</p>	<p>contributions leveraged by centres for research and commercialization activities</p> <p>2. Number and type of research and commercialization strengths (e.g. individuals, teams, networks, institutions, infrastructure, equipment) connected or leveraged by centres</p> <p>3. Number and nature (new vs. existing, technology push vs. market pull, technology vs. social outcomes) of partnerships and collaborations</p> <p>4. Assessment of the effectiveness of the centres to establish and/or strengthen the domestic collaborations (i.e. approach for engagement and collaboration, participation of relevant researchers, partner organizations, disciplines, institutions and sectors)</p> <p>5. Number and type of spillover of benefits to firms, receptor community, sectors and regions resulting from domestic collaborations</p> <p>6. Number and type (e.g. scientific, technological, social, health) of research challenges addressed by domestic collaborations</p>	<p>documents, federal government documents, literature on other commercialization programs in Canada)</p> <ul style="list-style-type: none"> ▪ File review (corporate plans, annual reports) ▪ Case studies (Interviews with centre management and partners, survey of centre partners) 	
<p>4.2. Attract investment to centres, partners and firms</p>	<p>1. Amount of investment leveraged by the centres and/or partner organizations (by type of investment, centre and source)</p>	<ul style="list-style-type: none"> ▪ Document review (CECR program documents, federal government documents, literature on other commercialization programs in Canada) ▪ File review (corporate plans, annual reports) ▪ Case studies 	<p>Summative evaluation (2015-2016)</p>

Issue / Question	Indicators	Data Collection Methods and Source	Timelines for Data Collection
		(Interviews with centre management and partners, survey of centre partners)	
4.3. Attract, retain and provide training to highly qualified personnel	<ol style="list-style-type: none"> 1. Number and nature of training opportunities provided by the program 2. Nature of research and business skills acquired by trainees 3. Assessment of the quality and utility of the training opportunities 4. Number and type of post-graduate students and post-doctoral researchers participating in centre research and/or partner organization research (Canadian vs. international) 5. Number and type of researchers participating in centre and/or partner organization research (Canadian vs. international) 6. Number and type of commercialization professionals (e.g. business leaders) participating in centres and/or partner organizations (Canadian vs. international) 	<ul style="list-style-type: none"> ▪ Document review (CECR program documents, federal government documents, literature on other commercialization programs in Canada) ▪ File review (corporate plans, annual reports) ▪ Case studies (Interviews with centre management and partners, survey of centre partners) 	Summative evaluation (2015-2016)
4.4. Open up new opportunities for Canadian firms to access world-class research equipment, facilities and networks	<ol style="list-style-type: none"> 1. Number and type of research and commercialization resources (e.g. research equipment, facilities, information and/or databases, business strategies/services, market intelligence, entrepreneurs-in-residence) and networks accessed by Canadian researchers and firms 2. Number and nature of relationships (new vs. existing) with international centres and research programs 	<ul style="list-style-type: none"> ▪ Document review (CECR program documents) ▪ File review (corporate plans, annual reports) ▪ Case studies (Interviews with centre management and partners, survey of centre partners) 	Summative evaluation (2015-2016)
4.5. Accelerate the	1. Number and type of technologies, goods or	▪ Document review (CECR program	Summative evaluation (2015-2016)

Issue / Question	Indicators	Data Collection Methods and Source	Timelines for Data Collection
commercialization of leading edge technologies, goods, services in priority areas where Canada can significantly advance its competitive advantage	services commercialized by centre partners 2. Number of technologies, goods and/or services where centres accelerated commercialization 3. Number and type of commercialization impacts (e.g. economic, social, health and environmental)	documents) <ul style="list-style-type: none"> ▪ File review (corporate plans, annual reports) ▪ Case studies (Interviews with centre management and partners, survey of centre partners) 	
4.6. Create, grow and retain companies in Canada that are able to capture new markets with breakthrough innovations	1. Number and type of companies created, grown and/or retained in Canada 2. Number and type of firms capturing new markets with innovations resulting from centre activities	<ul style="list-style-type: none"> ▪ Document review (CECR program documents) ▪ File review (corporate plans, annual reports) ▪ Case studies (Interviews with centre management and partners, survey of centre partners) 	Summative evaluation (2015-2016)
4.7. Deliver economic, social and environmental benefits to Canadians	1. Economic, social and environmental benefits (actual or potential) resulting from the program	<ul style="list-style-type: none"> ▪ Document review (CECR program documents, federal government documents, literature on other commercialization programs in Canada) ▪ File review (corporate plans, annual reports) ▪ Case studies (Interviews with centre management and partners, survey of centre partners) 	Summative evaluation (2015-2016)
4.8. Brand Canada as the host of internationally recognized centres of excellence in research and/or commercialization of research	1. Number and nature of recognition (national and international) of program and/or centres (e.g. media, awards)	<ul style="list-style-type: none"> ▪ Document review (CECR program documents, federal government documents, literature on other commercialization programs in Canada) ▪ File review (corporate plans, annual reports) ▪ Case studies (Interviews with centre 	Summative evaluation (2015-2016)

Issue / Question	Indicators	Data Collection Methods and Source	Timelines for Data Collection
results		management and partners, survey of centre partners)	
5. To what extent are efficient and effective means being used to deliver the program?	<ol style="list-style-type: none"> 1. Factors inhibiting and/or facilitating program delivery 2. Assessment of effectiveness and efficiency of program delivery (e.g. clarity of program objectives in areas of research and commercialization, effectiveness and efficiency of competition and grant administration processes) 3. Comparative assessment of program delivery model with other approaches used to support commercialization 4. Assessment of the program's progress towards the proposed actions to address the recommendations of the formative evaluation to improve program implementation 5. Potential changes to the delivery model to improve efficiency and/or effectiveness 	<ul style="list-style-type: none"> ▪ Document review (CECR program documents, federal government documents, literature on other commercialization programs in Canada) ▪ Key informant interviews (NCE management, federal granting agency representatives, Industry Canada representative, PSAB members, expert review panel members, applicants from non-funded full applications, provincial government representatives) ▪ Case studies (Interviews with centre management and partners, survey of centre partners) 	Summative evaluation (2015-2016)
5.1. To what extent have centres implemented effective delivery models and management practices to achieve expected outcomes?	<ol style="list-style-type: none"> 1. Comparative assessment of centre management and delivery (e.g. structure, operation, leadership and governance) 2. Comparison of delivery models and management practices used by pre-existing and new centres 3. Factors facilitating or inhibiting centre performance 	<ul style="list-style-type: none"> ▪ Document review (CECR program documents, literature on other commercialization programs in Canada) ▪ File review (corporate plans, annual reports) ▪ Key informant interviews (NCE management, PSAB members, expert review panel members) ▪ Case studies (Interviews with centre management and partners, survey of centre partners) 	Summative evaluation (2015-2016)
5.2. To what	1. Identification of	▪ Document review	Summative evaluation

Issue / Question	Indicators	Data Collection Methods and Source	Timelines for Data Collection
<p>extent can the efficiency of the program be improved?</p>	<p>improvements to program delivery to increase efficiency</p> <p>2. Ratio of administrative costs to total program costs for the program and comparable programs</p>	<p>(CECR program documents)</p> <ul style="list-style-type: none"> ▪ File review (corporate plans, annual reports) ▪ Key informant interviews (NCE management, PSAB members, expert review panel members) ▪ Case studies (Interviews with centre management and partners, survey of centre partners) 	<p>(2015-2016)</p>