Collaborative R&D Program

Application Guidelines

The purpose of this document is to provide applicants with guidance about how to develop a strong application for the bi-lateral R&D program managed by ISTPCanada. This includes relevant information to help potential applicants in understanding the various processes and steps needed to complete a funding application. They should apply notwithstanding the specificity of the partner country or the targeted priority sectors. ISTPCanada funding applications are usually accepted through specific Calls for Proposal (CFP) Announcement. Additional details related to partner country, targeted priority sector(s), and participation of additional funders, will be clearly described in each Call for Proposal Announcement. Potential applicants are invited to regularly visit ISTPCanada web site, and to sign up online to receive instant ISTP ALERTS to find out when the new CFPs are released.

# Program Overview

ISTPCanada develops and implements R&D collaboration programs under Science and Technology (S&T) cooperation agreements between Canada and its key trading partners, including India, China, and Brazil. Mandated by the Government of Canada through Foreign Affairs and International Trade Canada (DFAIT), ISTPCanada stimulates early-stage partnership development activity; facilitates the creation of new partnerships between Canadian companies, research organizations and their counterparts in countries; and fund cooperative R&D projects with high commercial potential.

The key objectives of this program are:

* to encourage domestic competitiveness through the transfer of technology and knowledge resulting from international S&T partnerships;
* to foster international S&T partnerships and collaborative research with an emphasis on industrial outcomes;
* to accelerate the commercialization of R&D that would benefit Canada and the partner country, through international partnerships, with a focus on small and medium-sized enterprises;
* to access international technologies for Canadian enterprises;
* to promote Canadian R&D capacity and Canada as a destination for foreign technology-based investments;
* to encourage the mobility of researchers and to promote Canada as a career destination for foreign researchers and highly qualified personnel; and
* to strengthen overall bilateral S&T relations.

The Planned Results of the program are as follows:

* Firms participating in ISTPCanada‑funded projects are positioned effectively in target markets and sectors to engage in innovative technology‑driven R&D and/or adoption.
* Canadian-based firms have increased knowledge and understanding of global innovation and business networks.
* The international R&D community, in targeted markets and sectors, demonstrates an increased awareness of Canadian technological capabilities.
* Canadian-based Firms have access to, and participate in, global R&D networks in targeted markets and sectors.
* Innovative technologies are developed and commercialized.

# NSERC-ISTPCanada Joint Funding Opportunity

In February 2012, ISTPCanada and the Natural Sciences and Engineering Research Council of Canada (NSERC) joined forces and signed an agreement aligning their respective collaborative R&D programs. The alliance enables ISTPCanada and NSERC to jointly solicit, evaluate and fund collaborative R&D projects that bring together Canadian companies and academic researchers and collaborating counterparts from partner countries under the International S&T Partnerships Program (ISTPP). Within the program managed by ISTPCanada, this includes China, India and Brazil.

Please note that the proposed area of R&D must be in accordance with NSERC CRD or ARD grant objectives. For projects involving college researchers, all research areas are eligible since the ARD grant covers tri-agency mandates.  For CRD projects, strictly natural sciences and engineering research areas are eligible; therefore projects in health and/or social sciences and humanities are not eligible.

Under the new agreement, Canadian companies that apply for funding through the ISTPCanada collaborative R&D program have the opportunity to leverage academic expertise and involve students jointly with NSERC. For the first time, university and college researchers participating in the ISTPCanada projects may apply for NSERC Collaborative R&D (CRD) and/or Applied R&D (ARD) grants as part of the funding application to ISTPCanada.

Project teams that wish to apply for joint ISTPCanada-NSERC funding must provide details of the academic-industry component of the proposed R&D project. This includes how the project will enable the development and training of highly qualified people. The application form includes a specific section on this anticipated outcome. All project teams seeking NSERC funding are required to provide this information in both the Expression of Interest (EOI) and the complete proposal. In addition, applicants are also required to submit a specific budget for the CRD/ARD component of the project. A budget template is provided with both the EOI and proposal application form for this purpose.

Applicants are only required to submit a **single** application to ISTPCanada to request funding for both the company and the academic organization for the proposed R&D project. ISTPCanada and NSERC will implement an integrated, merit-based project evaluation and selection process. A positive funding decision for R&D projects that request funds from both organizations will trigger:

* ISTPCanada to allocate funds to industry participants; and
* NSERC to allocate funds to academic participants.

As per the terms and conditions for NSERC CRD and ARD grants, the industrial partner is required to make a cash contribution to the collaborating academic research partner to receive NSERC funding for the project. Companies that wish to leverage NSERC funds are can contribute up to a maximum of $100,000 or 25 percent of the total ISTPCanada contribution (which ever is less) to the collaborating academic researcher. Industry partners are permitted to use ISTPCanada funding to support the research component of the project. For every dollar a company contributes to an academic researcher, the firm leverages up to two in return from NSERC, depending on the level of in-kind support of the direct research costs that the company commits to the CRD/ARD component.

**Example:**

Company *ABC* is leading a collaborative R&D project with a total value of $800,000. ISTPCanada provides $400,000 to the firm (consistent with the terms of its bilateral R&D call for proposal). Company *ABC* may draw $100,000 from this $400,000 allocation and provide it to the collaborating academic researcher on the project (maintaining $300,000 for the tasks they will undertake as the industry partner on the project). As the company has provided $100,000 to the academic partner ($75,000 used for direct research and $25,000 for academic institute overhead), NSERC will contribute up to $150,000 (twice the company contribution for direct research which is $75,000 x 2) to the project, provided sufficient in-kind contribution from the company. Any University overheads taken from the company contribution cannot be levered for NSERC funding. This increases the total value of the Canadian component of the project to up to $950,000. See a budget below showing the amounts in the example above in a Table 1.

*Table 1: Typical Canadian Industry-Academic collaboration Budget*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CANADA Funding Sources** | **R&D Performers** | | |  |
| **Company ABC** | **University A** |  | **Total Actual Cost** |
| **Lead Company Contribution** | **$400,000** | **$100,000** transferred from Company ABC to University A; $75,000 used for direct research, and $25,000 for overhead |  | **$400,000** |
| **ISTPCanada** | **$400,000** from ISTPCanada ($100,000 is transferred to University A) |  |  | **$400,000** |
| **NSERC** |  | **Up to $150,000** (Industry contribution could be doubled by NSERC matching funds) |  | **Up to $75,000 x 2 = $150,000** |
| **Total Actual Budget** | **$700,000** | **Up to $250,000** |  | **Up to $950,000** |

**Please note:** Industry participation from Canada and the partner country is required on ISTPCanada-funded projects (although some exceptions apply to China participants). Academic participation is strongly encouraged however it is not required for ISTPCanada funding. The academic research component of a project must be an integral part of the proposed R&D and managed as a core part of the project by the lead company.

# Application Process

Funding application will only be received following the official Call for Proposal Announcements on ISTPCanada website. Each CFP will define the priority sector(s), if any, and establish the desired project parameter specific to that CFP. Normally, ISTPCanada support (up to a maximum of 50% of the eligible Canadian costs) has an upper limit of $600,000 (please refer to CFP for specific amount). Project duration is typically 2 to 3 years, although longer project duration could be considered. Applications seeking funding support from ISTPCanada may be submitted in two different ways:

* Simultaneously by the Canadian and international co-lead to their respective implementing organisations in each country (this is normally the case for Canada-China CFPs);
* Jointly in a single application by the Canadian and international co-lead to the implementing organisation identified in the CFP Announcement (this is normally the case for Canada-India CFPs)

CFPs will normally involve a 2-stage process. Applicants will first be asked to submit an “Expression of Interest” (EOI) which, amongst other requirements, outlines the proposed work, identifies the project team, establishes the technical and commercial relevance and provides a summary of project funding from all sources. Applicants proceeding to the second stage will be asked to submit a full proposal which would seek greater project detail as well as additional information relating to, amongst other things, commercialization potential and IP management. In the CFP, applicants may also be directed to additional requirements specific to the implementation organizations in each country.

## Expression of Interest (EOI)

Submission of an EOI is mandatory. Applicants interested in submitting a full proposal must submit an EOI before the due date (See the CFP for deadlines) to be eligible. In the EOI, the implementing organisations want to ascertain an overall, brief view of the proposed research and development collaboration project. Proponent must provide a brief explanation of the scientific value of the proposed project and the degree of innovation inherent in the proposed product or service being developed. Discuss the business opportunity of the proposed project and its capacity for commercial success in the near future. Finally, highlight the capacity of all participants of the project to manage and conduct the collaboration, including future commercialization leading to benefits for both countries. It is important to be **clear, concise, and to the point** when filling each section so to best present the merit of your project in an effective manner.

The EOI form is similar to the full application form except that it requires less detailed information. The EOI should be no longer than 8 pages of content excluding the cover page and the instructions provided in the template. Please use the template provided with call documents for submitting the EOI (Call documents are available at www.istpcanada.ca). Incomplete EOI template or EOI’s submitted in any other format will not be accepted.

Please note that the EOI review will have three possible outcomes:

* EOI meets all the requirements and lead participants are requested to submit a full proposal;
* EOI clearly does not fit the program criteria and lead participants are advised not to submit a proposal;
* EOI fits most of the criteria, but the lead participants are requested to provide extra clarification or modification before a final decision can be made.

Implementation Organizations decision on the acceptance / rejection / enhancement of EOIs will be communicated to the applicants shortly after the EOI deadline.

Please refer to the full proposal guidelines below to get a better understanding of what might be included to strengthen the EOI.

## Full Proposal

Applicants invited to submit a full proposal will receive an application template along with the EOI acceptance letter from the implementation organization. **Applications in any other format will not be accepted.** Proposals for the Collaborative R&D Program will include a technical and a business component. The technical component describes the innovation, gives details of the proposed technical approach and contains a research Program Plan. The business component covers the market analysis, commercialization plans, and benefits to project participants, project organization, and the management plan. The proposal will also provide a description of the companies and other participants along with detailed resumes of key project personnel. Please refer to the following sections to get a better understanding of what will be covered in the application form:

### The Innovation

* What is the current "best practice"?
* What are the current limitations? This is an opportunity to elaborate on the shortcomings that exist in the proposed area of innovation as a prelude to the description of the innovation and how it can overcome these shortcomings. Current limitations could include: high cost, sub-optimal performance, lack of attention to specific market opportunities, e.g., poor suitability to high-or-low-end markets, size, compatibility, nonconformance to standards, etc;
* What is the idea? Sketches, diagrams and tables could be included to help describe the innovation. This description should clearly identify in what way(s) the innovation overcomes current limitations. How the idea overcomes these limitations is to be contained in this section;
* How much will the proposed program cost and how long will it take to develop the product to the point of commercial readiness?
* What is the patent situation, including background patents and the potential for new patents? Are there any obligations to other agencies which have supported any part of the innovation development?
* Which standards relate to the developed product? Will the proposed product meet current and/or emerging standards?

### Proposed R&D Program

This section of the proposal could be organized in two parts: "Analysis of the Problem" and "Proposed Approach".

#### Analysis of the Problem

The purpose of this section is to establish a credible basis for the proposed R&D program, with the intent of identifying specific problem areas. These are the problems or challenges that need to be overcome in order to achieve the program objectives. For example, at the start of the project, the companies and participants are at Position A, which relates to the current limitations highlighted in the preceding section. By the end of the project, at the point of commercial readiness, the companies and participants expect to be at Position B. What specific problems must be solved or overcome in order for the companies to reach Position B, consistent with the project budget and timetable? Clearly, these problems and their resolution should have been considered by the participants in formulating their Proposed Approach and in defining the Program Plan.

The problems may focus on a variety of technical issues – for example, how to achieve lower power consumption or higher circuit speed with data indicating both the current situation and the target values for the innovation. Process challenges may include how to enhance measurement accuracy; improve manufacturing yield; make the software platform-independent; automate a process, etc. Product targets may relate to issues such as the design of a more streamlined system with fewer parts, improved temperature performance, greater reliability, smaller footprint, enhanced market appeal, or greater flexibility. In some cases, the problems may relate to the need for fundamental technological breakthroughs in order to develop a currently nonexistent product. In others, for example, the technological problems may be relatively straightforward, with key issues relating to product integration into an existing line or management of a complex, inter-disciplinary, multi-task project.

Additional items to be addressed in this section may include:

* Definition of the required properties and functions of the end-product that will be used in the service environment. Often, this is referred to as "the specifications sheet". This is the “Position B” referred to previously in this section. What market input has contributed to formulating the end-product characteristics?
* Identification and description of problems associated with realizing the required properties and functions. This is an in-depth discussion of the problems that must be solved in order to achieve the program's objectives. The participants should confirm that any critical technologies required are firmly under control.

#### Proposed Approach

This section must be sufficiently detailed for expert reviewers to assess the approach being followed for the research. It should include:

* A general plan of the proposed effort setting the stage for the more detailed task descriptions. This overall plan includes the achievements that will make it possible to realize the program's objectives;
* Any technical or economic constraints;
* Identification and detailed description of each task. This is the heart of the technical part of the proposal, stating the objective for each task and identifying the participant with primary responsibility for the task;
* Describe - for each task - the specific approach that will be employed, i.e., detail the techniques to be used to solve the previously identified problems. In this section, the participants demonstrate that they are aware of current best practice, its limitations and the opportunities inherent in the proposed innovation. As well, this section should demonstrate that the proposer understands the problems associated with developing the idea of commercial readiness;
* Discuss alternate approaches to resolving problems and the basis for selecting the preferred solution. Even if a preferred solution has not yet been determined, the various alternatives should be reviewed along with their relative merits;
* The detailed description of the technical approach should provide the reviewers with sufficient information to perform a meaningful review of the proposal. For each task, provide supporting information that justifies the specific approach, where appropriate;
* Since the final objective is a product or process, tasks addressed should include compliance to standards (or why the product will not comply with applicable standards), prototyping, regulatory approvals, exhibitions, marketing activities, documentation, etc. Again, for those tasks relating to "testing", for example, details should be given as to what is to be tested, how many tests are needed, test objectives, test methodology, expected results, etc.

### Program Plan

Should the project be approved, the Program Plan section of the proposal will be incorporated into the Project Funding Agreement and will be used by ISTPCanada in monitoring project progress. For projects with duration 18 months or less, the effort should be organized into one project period. For longer projects, the effort should be organized into two periods of roughly equal duration. Note that regardless of the project duration, progress and financial reporting will be required every six months.

The Program Plan should consist of:

* A chronological schedule of program activities presented in graphical form, clearly indicating the estimated time required for the completion of each task in addition to milestones. Specific participant assignments for each task should be identified in the Program Plan even if this information was provided elsewhere, and task assignments for subcontractors and consultants should be delineated;
* A one page summary Gantt chart;
* A Work Breakdown Structure (WBS) detailing the planned time commitment for each task, covering the same project duration (see example in Table 2);
* And encompass the entire duration of a multi-period program, including all activities that must be performed until commercial readiness.

**Table 2: Example Work Breakdown Structure and Estimated Effort**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Task #** | **Title** | **Task Description** | **Start Date** | **End Date** | **Effort Days** |
| **1000** | **Phase 1** | | | | |
| **1100** | **Project Management** | | | | |
| 1110 | Project Management and support | Plan and monitor project activities and progress  Implement and monitor subcontracts  Monthly and quarterly reports |  |  | 70 Participant A |
| 1120 | Meetings | Kick-off meeting  Quarterly review meetings |  |  | 10 each |
| **1200** | **High-Level System Requirements and Design** | | | | |
| 1210 | System requirements and design | Overall system requirement specifications  Overall system conceptual architecture and design  System components definition |  |  | 60 Participant A  20 Participant B |
| **1300** | **Data Plan** | | | | |
| 1310 | Data planning, acquisition and preparation | Data planning  Data acquisition  Data preparation and processing |  |  | 20 Participant A  20 Participant C |
| 1320 | Model data integration | Integrate data into models  Test models and analyze outputs |  |  | 40 Participant A  40 Participant C |
| **1400** | **Model identification and definition** | | | | |
| 1410 | Application crop model implementation | Model identification, development and testing |  |  | 60 Participant A  60 Participant C |
| 1420 | Integrated intelligent model implementation | Model identification, development and testing  Establish and test system communication |  |  | 80 Participant A  10 Participant B |
| 1430 | Product generation model implementation | Model identification, development and testing |  |  | 40 Participant A  10 Participant B |
| **1500** | **Hardware and Software Identification and Acquisition** | | | | |
| 1510 | Sensors | Identify and purchase sensors  Install, test and maintain sensors |  |  | 10 Participant A  40 Participant C |
| 1520 | Software acquisition | Software development and testing |  |  | 10 Participant B |
| **1600** | **Commercialization requirements** | |  |  | 20 Participant A  20 Participant D |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **Total Effort (Person Days)** | | |  |  | **XX Participant A**  **YY Participant B**  **ZZ Participant C**  **AA Participant D** |

### The Market

Although there are uncertainties implicit in predictions of future markets and possible competition for any new product or process, it is important to demonstrate that the participants have made a thorough analysis of the market. Such an analysis can typically include the following considerations:

* What market needs are served? Are one or more participants currently active in developing, manufacturing and selling similar types of products in this market? What is the basis for this market need?
* What is the total addressable market for the product? What is the current position of the participants in this market? What is the expected growth of this market over the effective sales window of the product being developed, and what is the basis for this projection? What events could significantly alter this projection? What market share is expected to be captured in the year of market entry and over the product sales lifetime?
* What barriers, e.g., regulatory, might be encountered, and how will they be overcome?
* What competition exists or do you expect in the future? Provide an evaluation of the impact of competition on the commercialization of the proposed product.

This is not a complete list. The basic message is that developing innovative concepts for commercial gain is an intrinsically risky, uncertain, but occasionally highly rewarding undertaking whose prospects of success can be immeasurably improved by finely tuned, objective and early planning. The participants should present whatever additional information they consider relevant.

### Commercialization – Plans and Prospects

It is obviously beneficial to those making investment decisions regarding new technology if a single index can be derived which provides a "figure of merit" for deciding on a particular investment, or for evaluating various alternatives.

A preliminary financial analysis which includes the potential gain from successful implementation of the proposed project should be made using a Cash Flow Analysis approach of your choice.

Should the project prospects be encouraging, the commercial program needs to be planned and implemented? Some of the questions to be discussed are:

* Will the participants be engaged in production? What are the existing manufacturing facilities and how can the proposed product manufacturing be incorporated into the existing infrastructure?
* Who will sell to which market regions? What is the current sales level of the participants in the primary target regions for the proposed product?
* Do any of the participants currently have a suitable sales and service network? If there is such a network, it should be described. Alternatively, does such a network need to be created from scratch? Describe the process by which the participants plan to establish such a network and the resources required;
* Considering the maximum cash requirements based on the cash flow analysis, to what extent are the necessary resources - financial or otherwise - available within the participating companies? If any additional resources will be required, how will they be mobilized? Describe all relevant potential sources.

### Cooperation and Benefits

The clear expectation of risk and benefit sharing by participants during product development and commercialization is essential under this program. An important factor in evaluating the proposal, therefore, is the extent to which the participants will share in the research, product development and introduction to the marketplace, as well as the benefit to be derived by each participant during product commercialization. Also of importance are the expected socio-economic benefits in each participating countries in the form of new export markets, new employment opportunities, new capital formation, productivity improvements, etc.

Please elaborate these issues in the context of the agreement between the participants with respect to their agreed-upon roles during the various project stages including the commercialization process.

If there are plans for exchange of young researchers involved in this project, please indicate the length of exchange and the role(s) to be played in the R&D activities. Also explain how the exchange of young researchers adds value to the project goals.

### Organization and Management Plan

This section should contain a presentation of the proposed management procedures for the program, including the internal review procedures and overall management plan that will ensure, barring unforeseeable circumstances, implementation to design specifications, on schedule and within budget.

* Describe the procedures to be implemented to maintain timely communications between lead participant's project team in each country. Indicate the role of review meetings (when, where, for what purpose, with whom) during the project;
* Provide an organization chart for the project, identifying each participant's project leader and the overall program manager, and indicate the relationship of this ad hoc organization to the formal hierarchies in the participant’s organization. Identify the program's key project personnel and their responsibilities;
* Regarding staff - indicate positions to be filled by new employees and identify the status of these staff;
* Identify the role of key consultants and subcontractors on the organization chart and indicate if a relationship between the consultants/subcontractors and the participants currently exist.

### The Participants and the Project Personnel

In the final analysis, the determining factors in the successful commercialization of innovation are the people and the participating companies involved. Please provide information about each of the participants, including the following:

* In the case of company participants, please provide the year in which each company was established, company ownership and principal business of each company;
* Record of performance in similar/related undertakings. Describe the extent to which products similar or related to the proposed innovation have been developed and commercialized. What is the track record or history of each participant that also substantiates a positive prognosis for this proposed product's successful commercialization?
* Degree to which the proposed project can be absorbed into the existing structure of each participant. To what extent are the staff, equipment, facilities, etc., available for the project? Identify the need to hire staff, obtain (purchase, lease or rent) capital equipment, or expand manufacturing operations;
* Relationship of the proposed project to other participant projects that receive/have received support from any outside agency for development of the proposed innovation;
* In the case of company participants, the financial information validating that the companies cannot only contribute their share of the project cost, but have the resources available for the commercialization phase. Public companies can submit annual and quarterly reports rather than specially prepared information. At a minimum, annual revenues expected during the current fiscal year and realized during each of the last two fiscal years should be given, in addition to an indication of the profitability of the company participant during this period. Number of employees at home, at field locations and abroad should be given, along with an indication of changes in the employment picture during the past two years;
* Description of relevant facilities, equipment, infrastructure, etc., which are expected to be utilized during the project and during product commercialization;
* Resumes of key personnel/researchers who will work on the project. The resumes should include each individual's role in the project, e.g., project manager, senior software engineer, field engineer, etc. Include the person's current affiliation with the participant’s organization, job title, relevant job experience and significant accomplishments, starting from the most current position. List professional affiliations and committee memberships. Indicate higher education and degrees and provide a listing of relevant publications authored or co-authored (maximum, one page). Resumes of consultants should also be included. In general, the reviewers of the proposal need to see that the experience, education and capabilities of the professional staff are commensurate with the R&D tasks to be performed;
* Additional pertinent information, such as product brochures, expressions of interest from potential customers in the products or processes to be developed, marketing agreements, etc., should be included.

### Intellectual Property Treatment

Most of the collaborative projects funded under this program are expected to produce new intellectual property (IP). The program also recognizes the value to the participants of any background IP they might bring into the project. In general, a participant’s background IP will remain vested with the owner.

Please provide a detailed list of the background IP brought into the project by all participants. The proposal must describe, to the extent possible, the new IP which is expected to result from the project and must address the proposed treatment of all the intellectual property. This includes the ownership of new IP and sharing of the new IP between the participants. Any IP agreement between the participants must respect the IP laws of each country along with the IP policies of the academic and other research institutions involved in the project. A signed IP agreement between all participants in the project is required before funds will be released to the project team.

### Project Budget

A separate budget should be presented for the project component in each country covering each participant's activities for each period of the project as proposed (Please use the appropriate budget sheets for each participant. Successful EOI applicants will receive a template for the full proposal along with the budget sheets. Each participant should provide its budget detail in the prescribed budget sheet and the lead participants should provide an overall budget for the project’s national components.

Furthermore, the funding of the project begins from the effective start date agreed upon in the project funding agreement signed with the successful lead participants. Expenses incurred by the participants prior to the effective start date of the project cannot be restructured to fit into the eligible expenditures.

**Canadian Stacking Rule**

**Please note that a stacking rule applies to the Canadian component of all projects.** A stacking limit is the total of all government assistance as a percentage of eligible costs. Total government assistance includes federal, provincial and municipal funding. This stacking limit for this program is 75%. Any amount exceeding this limit is subject to recovery. It is the responsibility of the applicant to disclose all the sources of government funding in the proposal and during the life of project.

For example, if the Canadian cost of the R&D project is $200,000, a maximum of $150,000 could be provided by federal, provincial and/or municipal government agencies, programs or institutions (labs etc). The remaining $50,000 of the project budget must be derived from a non-government source. The proposed project budget for the EOI and full application observe the stacking rule limit.

# Project Agreement

Lead participants of the selected projects are required to complete all necessary internal procedures for project implementation (pre-screening form for Canadian Environmental Assessment Act provided with the full application template), and enter into an agreement or Contract with their implementing organization.