

NATIONAL PLATFORMS FUND HIGH PERFORMANCE COMPUTING

CALL FOR PROPOSAL

The objective of the National Platforms Fund is to provide research infrastructure, resources, and services that meet the needs of many research areas, and that may require periodic reinvestments to stay competitive internationally because of the nature of the technologies. To achieve this objective, a pan-Canadian approach or strategy that builds on and transcends the priorities and development plans of single institutions is needed, and requires the support of a number of partners and agencies. High Performance Computing has been identified as meeting the purpose and intent of this funding mechanism.

Over the last few years, rapid developments in technology and enabling research tools, including advanced computing, have revolutionized the way research is done. Once used by only a limited number of researchers in a few select fields, these computing resources have now become essential to advancing research frontiers in all areas from health sciences to engineering to natural, social, and human sciences.

In Canada, a number of stakeholders have made significant investments in high performance computing. Canadian institutions have formed consortia to acquire and manage computational facilities more effectively, and to better meet the needs of researchers. These regional HPC consortia include WestGrid, HPCVL, SHARCNET, SciNet, CLUMEQ, RQCHP, and ACEnet.

This uniquely Canadian model has been a major success. These regionally based consortia have begun to provide Canadian institutions and their researchers with access to state-of-the-art computing resources. This enables the pursuit of research and partnerships in areas of strategic importance to Canada and is contributing to enhanced international competitiveness and leadership.

Further investments in HPC are now required to maintain the momentum created through these successful initiatives. Resources alone will not be sufficient to achieve this objective. Also required is greater mobilization of, and collaboration among, the various stakeholders across the country. It was with this objective in mind that a workshop was held in October 2005 to discuss next steps in planning and supporting HPC capabilities in Canada. This exercise was greatly facilitated by C3.ca's publication in August 2005 of *The Long Range Plan for High Performance Computing in Canada*. The workshop involved over 30 participants representing key stakeholders including universities, funding agencies, industry, as well as federal and provincial governments. A significant outcome of the workshop was the agreement to move forward with an integrated, pan-Canadian

strategy for HPC over the next three to five years to ensure Canada's international competitiveness in this area.

A SINGLE PROPOSAL

The applicants are expected to work towards an integrated, pan-Canadian strategy for HPC spanning three to five years. This will result in the submission of a single proposal that will:

- ensure access to internationally competitive HPC resources that will benefit institutions and their researchers from across the country;
- provide effective governance at both national and regional levels;
- ensure alignment between capital investments and human infrastructure needs, as well as operational and maintenance needs;
- provide a persuasive plan that provides solutions and assurances on longer-term sustainability issues, extending beyond the timeframe over which the requested NPF and other funds would be expended;
- propose the acquisition of HPC resources within the budget available for capital investment (see below).

No other proposal requesting generic HPC resources will be entertained outside of this single proposal. It is therefore incumbent upon the applicants to develop a proposal that considers and addresses appropriately the needs of institutions and their researchers. An open, inclusive approach will be critical for success.

ELIGIBILITY TO APPLY

The complexities involved in the development of a single, integrated proposal are substantive. Considerable flexibility will therefore be allowed with regard to the designation of a lead institution and/or a project leader.

ELIGIBLE COSTS

Funding may be requested from the CFI, Provinces, NSERC, CIHR, SSHRC, and Genome Canada. As eligibility of use of funds can vary between organizations, applicants are expected to communicate with these and other potential partners as they prepare the application.

The CFI will provide up to 40 percent of the total eligible infrastructure cost of the proposal to a maximum of \$60 million. Institutions must also identify the sources of funding for the remaining 60 percent of the capital costs.

The CFI will also contribute to the operating and maintenance costs through its Infrastructure Operating Fund (IOF). The IOF allocation (up to a maximum of \$18 million), is equivalent to 30 percent of the amount provided by the CFI.

THE ASSESSMENT CRITERIA

The assessment of the proposal will be carried out on two interdependent themes:

- 1 Impacts of past HPC investments;
- 2 Integrated, Pan-Canadian Strategy.

1. Impacts of Past Investments

1.1 Results and outcomes of past HPC investments. The extent to which past investments:

- enabled leading-edge research on computationally-challenging questions that would not have been possible to undertake without the HPC resources;
- enabled institutions and their researchers to gain a competitive advantage nationally and internationally;
- attracted and retained excellent researchers;
- enhanced the training of highly qualified personnel through research;
- strengthened partnerships among institutions and enhanced the efficiency and effectiveness of HPC resources;
- provided resources that are used to their full potential;
- contributed to bringing benefits to the country in terms of improvements to society, the quality of life, health and the environment or contributed to job creation and economic growth.

2. Integrated, Pan-Canadian Strategy

2.1 Quality of proposed research or technology development and appropriateness of HPC resources needed. The extent to which the proposed strategy will:

- enable computationally challenging research with the potential of being internationally competitive, innovative, and transformative, and that could not be pursued otherwise;
- meet the needs of institutions and their researchers effectively and efficiently;
- provide a high degree of suitability and usability;
- be scalable, extendable or otherwise upgradable in the future;
- incorporate reliable, robust system software essential to optimal sustained performance;
- provide a suitable and sustainable physical environment to accommodate the proposed systems and personnel, including adequate floor space, power, cooling, etc.

2.2 Effectiveness of the proposed pan-Canadian strategy in HPC in contributing to strengthening the national capacity for knowledge creation and innovation.

The extent to which the proposed strategy will:

- build regional, provincial, and national capacity for knowledge creation and innovation and for international competitiveness;
- ensure ongoing complementarities and synergies among regional facilities to create a national resource;
- combine the expertise and resources of regional facilities to ensure researchers have access to unprecedented depth and support in the application of HPC to the most computationally challenging research problems;
- attract and retain the best researchers or those with the highest potential;
- create a stimulating and enriched environment for training highly qualified personnel;
- strengthen multidisciplinary and interdisciplinary approaches, collaborations among researchers, and partnerships among institutions, sectors, or regions;
- ensure effective governance at both national and regional levels, including the management structure, accessibility and allocation of access to facility to different users, operation and maintenance of HPC resources on an ongoing basis;
- address all aspects and costs as well as long-term sustainability issues, including the relevance of the proposed distribution between funding partners and the nature and extent of support from institutions.

2.3 The potential benefits to Canada of the research or technology development enabled by HPC. The extent to which activities enabled by the proposed strategy will:

- contribute to knowledge creation and its application for job creation and economic growth in Canada;
- support improvements to society, quality of life, health, and the environment, including the creation of new policies in these areas.

The proposal must meet all criteria, to a degree appropriate to its size and complexity, in order to be funded or partially funded

THE PROPOSAL

The proposal must be submitted by **May 31, 2006** and the main body of the proposal will consist of up to 35 pages of free text, using regular 8.5"X11" page size, and no less than a 10-point font. Additional pages may be used for case-studies and budget (see below). Pictures and diagrams may be included within the number of pages permitted.

The applicants should structure the proposal to provide information that will address the four (4) assessment criteria (i.e. those listed in the previous section).

Specifically, the proposal must comprise a section of no less than seven pages for each criterion. The applicants will however have the flexibility to determine the structure and the sequence of the sections of the application. Relevant information should include but is not limited to:

- the process used to determine the current and future needs of institutions and their researchers in all areas of research;
- the job mix expected to represent the usage of the system(s) for research purposes. In this regard, the applicants should append case studies describing the type of leading-edge research that they would be able to undertake with the specific systems being acquired. Such case studies would not count as part of the 35 pages, but should amount to no more than 20 pages in total;
- an analysis of the performance of the proposed HPC systems against sets of benchmarks that are appropriate to the research applications envisioned;
- the implementation plan (what/where/when), including a risk mitigation plan, cost sharing strategy, and a detailed overall budget. The applicants should breakdown the budget by year, by region or facility, funding sources and types of costs, as appropriate;
- the process to be used for the allocation of access time, for data sharing and archiving, and for determining standards and protocols.

Only the 'Financial Information' module of a regular application needs to be completed for the National Platforms Fund. Note however that there is no page limit for the budget justification attachment. The main body of the proposal will consist of up to 35 pages of free text as described above. For further details on the submission process, applicants should contact CFI staff directly (email: alain.malette@innovation.ca telephone: (613) 943-1248). A paper copy of the proposal, including signatures from the Presidents [or their designates] of all participating institutions, should also be submitted.

THE REVIEW PROCESS

The proposal will be verified for completeness, and additional material may be requested to ensure that all required information is available for review.

An international review committee will be tasked with reviewing the proposal to assess its merits against the assessment criteria. The review committee will have the opportunity to meet with proponents to obtain further clarification and/or reassurances on aspects of the proposal. The review is a collaboration between the key funders, including the federal funding agencies and the provincial governments. It is designed to meet the respective decision-making needs of the various funding partners. Each agency will use their own internal decision-making process to reach a decision on the support of the proposal. Applicants

must be aware and agree with the multi-agency approach which will involve sharing evaluation material between potential funders.

THE FUNDING DECISION

The final funding decisions will rest with the various funding partners. It is expected that decisions would be made by December 2006.