



House of Commons Standing Committee on Finance – Pre-budget Consultations 2013

This brief is submitted by:

Canadian Association of Physicists

an organization

Organization name: _____

or

an individual

Name: _____

Topic: Innovation and commercialization

Recommendation 1: Please provide a short summary of your recommendation.

Sustain investment in basic research at universities, which creates knowledge and trains highly qualified people, both of which are foundational for long-term economic and social prosperity. To meet the budget 2012 goal to preserve "programming in support of basic research," new funds are needed to begin to compensate for reductions in basic research at the NRC over the past two years and inflationary erosion over a decade in NSERC Discovery Grants (DG) program. Thus, CAP recommends that baseline funding for basic research at universities through the DG be increased by at least \$15M (~5%).

Expected cost or savings: From the pull-down menus, please indicate the expected cost or savings of your recommendation to the federal government and the period of time to which the expected cost or savings is related.

\$10 million-\$99.9 million

Immediately

Federal funding: Please provide a precise indication of how the federal government could fund your recommendation. For example, indicate what federal spending should be reallocated, what federal tax measure(s) should be introduced, eliminated or changed, etc.

This recommendation is aligned with the Budget 2013 plan for a return to balanced budgets through fiscal restraint, allowing for modest spending growth in key areas, including world-class research and innovation. The amount of \$15M is consistent with the size of investments in Budget 2013 for research partnerships with industry through NSERC. Therefore, we believe this scale of new funding is possible in the current fiscal environment. By allocating the funds to the NSERC DG program, every new dollar will go directly to research, because an effective distribution mechanism is already in place.

Intended beneficiaries: Please indicate the groups of individuals, the sector(s) and/or the regions that would benefit by implementation of your recommendation.

Students and researchers in science and engineering programs at all universities across Canada may be immediate beneficiaries. Increased discovery grant funds will enable researchers to conduct more or higher-impact research and, in the process, hire and train more graduate students for science and technology careers.

General impacts: Depending on the nature of your recommendation, please indicate how the standard of living of Canadians would be improved, jobs would be created, people would be trained, etc.

Historically, the "payoffs" of basic research have been many: unanticipated innovations as a result of basic research include the discovery of X-rays, nylon, Teflon, GPS technology, informatics, superconductivity and medical imaging. It is widely recognized that investments in basic research will create more and better-paying jobs, boost productivity, and increase Canadian standard of living: "The greatest benefit to society will come from scientists for whom the practical utility and individual financial reward are minor considerations" [C.D. Howe Institute. Commentary 383. June 2013].

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Recommendation 2: Please provide a short summary of your recommendation.

Restore funding for purchases of equipment needed for basic research to historic levels. Currently, the NSERC Research Tools and Instrumentation (RTI) program depends on budgetary surpluses from other programs. These surpluses have been greatly reduced following the 2012 budget. Indirectly, and possibly as an unintended consequence, RTI funding has dropped from an average of \$35M/yr since 2003 to an expected \$6-10M/yr in 2013. Thus, to meet the budget 2012 goal to preserve "programming in support of basic research," dedicated funds for equipment are needed to compensate for this reduction.

Expected cost or savings: From the pull-down menus, please indicate the expected cost or savings of your recommendation to the federal government and the period of time to which the expected cost or savings is related.

\$10 million-\$99.9 million

Immediately

Federal funding: Please provide a precise indication of how the federal government could fund your recommendation. For example, indicate what federal spending should be reallocated, what federal tax measure(s) should be introduced, eliminated or changed, etc.

One possible source of funds that could be reallocated is the NSERC Discovery Accelerator Supplement (DAS) program, valued at about \$15M/yr, because we believe the RTI program has a much greater scientific impact. The impact of the DAS has declined in recent years due to new selection rules for the Discovery Grants. Baseline funds of \$25-\$30M should be allocated directly to the RTI program, which would then be supplemented by any surpluses from other programs as available. Since RTI supports capital purchases, some fluctuation in the amount from year to year is acceptable.

Intended beneficiaries: Please indicate the groups of individuals, the sector(s) and/or the regions that would benefit by implementation of your recommendation.

Students and researchers in science and engineering programs at all universities across Canada may be immediate beneficiaries. Restored RTI funds will enable researchers to purchase or upgrade equipment needed for their research programs. Without such source of funds, researchers will be unable to sustain current levels of research. If researchers must allocate funds from lab operating budgets to replace essential equipment, much less money will be available to train graduate students. Access to state of the art equipment is essential to high quality training of students for S&T careers.

General impacts: Depending on the nature of your recommendation, please indicate how the standard of living of Canadians would be improved, jobs would be created, people would be trained, etc.

Restoring funding for purchases of equipment needed for basic research to historic levels will allow Canadian researchers at universities to continue generating knowledge and training highly qualified people for science and technology (S&T) careers, both of which are foundational for long-term economic and social prosperity. Canadian standard of living will be improved as knowledge is commercialized or otherwise used for the public good, and as graduates with S&T skills make positive contributions to Canadian society as knowledge workers in industry and government.

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Recommendation 3: Please provide a short summary of your recommendation.

Coordinate funding for large research facilities that are shared by researchers from academic, government, and industry sectors. Coordination as a single portfolio will enable more effective planning for life-cycle costs, and smooth out requirements for capital funds over time. These facilities include those operated by the academic sector such as the Canadian Light Source, TRIUMF, SNOLAB, Ocean Networks Canada, as well as by the public sector such as NRC astronomy facilities and the Canadian Neutron Beam Centre at the NRU research reactor.

Expected cost or savings: From the pull-down menus, please indicate the expected cost or savings of your recommendation to the federal government and the period of time to which the expected cost or savings is related.

≤\$499,999

Immediately

Federal funding: Please provide a precise indication of how the federal government could fund your recommendation. For example, indicate what federal spending should be reallocated, what federal tax measure(s) should be introduced, eliminated or changed, etc.

Coordinating operating funds could be done initially in a cost-neutral manner by reallocating the many different federal contributions to these facilities into one agency mandated to oversee the portfolio. Budget 2013's lump-sum allocation to the Canada Foundation for Innovation (CFI) is yet uncommitted and is a potential source to fund capital costs in the short term, such as an academic contribution toward a new research reactor. With CFI's new long term mandate, it may now be positioned to oversee the funding of both capital and operating costs of large facilities.

Intended beneficiaries: Please indicate the groups of individuals, the sector(s) and/or the regions that would benefit by implementation of your recommendation.

Thousands of students and researchers in universities, government labs, and industry from every province access these facilities for their research. Industry and government users of large facilities include, for example, engineers seeking to solve materials challenges for oil & gas (pipeline reliability), automotive (fuel efficiency), aerospace (safety), metal production (new products and applications), energy (nuclear plant reliability), or defense applications (managing aging of naval fleets). The Canadian Light Source alone is accessed by about 1000 researchers per year.

General impacts: Depending on the nature of your recommendation, please indicate how the standard of living of Canadians would be improved, jobs would be created, people would be trained, etc.

Large research facilities are already enabling their users to train students and generate knowledge leading to innovation, including industries who increase their competitiveness through applied research (see above examples) or spin-off technology. In fact, these facilities are key contributors to our strong performance in physics & astronomy [CCA. State of S&T in Canada. 2012]. Coordinating funding for these facilities will enhance Canada's return on the billions already invested in them by making more effective use of existing resources.

Please use this page if you wish to provide more explanation about your recommendation(s).

Our recommendations are crafted to consider the fiscal environment and the government's policy direction to return to balanced budgets through fiscal restraint, allowing for modest growth in key areas, including world-class research and innovation. Furthermore, budget 2012 sought to preserve "programming in support of basic research" [Annex 1: Industry Portfolio] in the midst of wide-ranging spending cuts across many government departments.

Despite this good intention, basic research capacity has been reduced through cuts to the NSERC RTI and MRS programs and reallocation of resources within the National Research Council. Meanwhile, the NSERC Discovery Grant program has been eroding from inflation for at least a decade, putting great strain on the system.

We believe the amounts requested for new funding or reallocation are possible in the current fiscal environment, and are important to compensate for these losses.

Regarding the need for coordinated funding for large research facilities, the current system is ad hoc, which Suzanne Fortier, former President of NSERC, compared to spending all your money on a car without budgeting for insurance and gas [Research Money, October 10, 2012]. Facilities often piece together their funds from several sources that are usually short-term and not coordinated with each other. Often, they must expend significant effort on seeking political support for funds for core operations or capital projects.

The government took a positive step by establishing the CFI Fund for Major Science Initiatives in 2010, which awards up to 40% of a facility's operating funds for five years. Yet a full solution is still needed, since only a handful of facilities are eligible, a majority of costs must be found elsewhere and it is uncertain whether this CFI Fund will exist after 5 years.

Coordinating funds under one agency will enable better life-cycle planning that links capital and operating money, applying best practices to all facilities. A positive example of life-cycle planning to maximize return on investment is the 2012 announcement of funding for construction of the Canadian High Arctic Research Station, which notably included funds during the 6-year construction period for ramping up associated research programs that will use the facility, as well as a commitment to later funds for on-going operations.

Coordinating funds under one agency will also allow for smoothing out requirements for capital funds over time. It is of great concern to the physics research community that several large funding requests are due in the next few years (e.g. 5-year renewal of TRIUMF, contributions to a new research reactor, or to new and existing international facilities for astronomy or particle physics). Smoothing out these requirements will not change the total amount of funds needed, but may make it easier for Canada to digest in an orderly fashion.

*Please note that at least one recommendation must be provided

