Canadian Association of University Teachers
Association canadienne des professeures et professeurs d'université

Response to Industry Canada's Consultation Paper

"Seizing Canada's Moment: Moving forward in Science, Technology and Innovation"

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CAUT ACPPU

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I. Introduction and Summary

Canada is in need of a new science policy and strategy. The current direction of the federal government is threatening to impede scientific progress and compromise the integrity and independence of public science. This is reflected in the government's waning commitment to funding basic research; its attempts to steer funding toward politically targeted priority areas or to projects with ostensibly foreseeable commercial outcomes; the muzzling of public scientists; and deep cuts to government scientific agencies, programs and libraries.

The Canadian government needs to pursue a different science strategy that puts the public interest first and builds upon the proven strengths of government and higher education-based research. The Canadian Association of University Teachers recommends that the government build a new approach based on the following priorities:

- Renew investments in basic research guided by priorities set by the scientific community;
- Implement measures to protect the integrity and independence of university and college research including adopting safeguards to prevent the politicization of research; and
- Increase support for government science and scientists.

II. Renew Investments in Basic Research

> *Governments come and go, but scientific expertise and experience cannot be chopped and changed as the mood suits and still be expected to function. Nor can applied research thrive when basic research is struggling.*
>
> *Nature*, 487, 271–272 (19 July 2012)

Basic research refers to experimental and theoretical work undertaken with the primary aim of acquiring new knowledge, and not necessarily with any particular application or use in view. The objective of basic research is to gain more understanding of the subject under study. Although basic research may not have specific applications as its goal, the most important scientific discoveries have typically come from basic research driven by a quest for knowledge.

Despite the claims to the contrary in the discussion paper, the federal government's support for the conduct of basic research in Canada has stalled in recent years. The budgets of Canada's three granting councils – the Canadian Institutes for Health Research (CIHR), the Natural Sciences and Engineering

Research Council (NSERC), and the Social Sciences and Humanities Research Council (SSHRC) – have seen only modest growth in their base budgets. As a result, when adjusted for inflation basic research funding is well below levels recorded in 2007 when the government adopted its *Mobilizing Science and Technology to Canada's Advantage* strategy. Overall, base funding for SSHRC is down over 10 per cent in real terms, support for NSERC has dropped 6.4 per cent, and CIHR funding has declined by 7.5 per cent.

Granting council base funding, 2007-2014 (constant 2010 dollars, millions)

	2007-08	2008-09	2009-10	2010-2011	2011-12	2012-13	2013-14	Change (2007-14)
SSHRC	383.7	358.1	368.1	359.4	355.6	351.5	344.8	-10.1%
NSERC	1057.9	1051.5	1042.3	1050.2	1030.8	1018.9	990.3	-6.4%
CIHR	1017.8	989.8	1020.1	1026.9	953.0	969.4	941.4	-7.5%
Indirect costs	327.9	335.7	330.9	324.9	322.6	318.9	302.0	-7.9%
Total	2787.2	2735.0	2761.5	2761.4	2662.1	2658.7	2578.4	-7.5%

Source: *Calculations based on SSHRC, NSERC, and CIHR Departmental Performance Reports, Budget 2012 and Budget 2013*

One impact of this declining support in real terms for basic research has been a marked decline in the number of promising research projects that can be funded. The success rate for NSERC's discovery grants has fallen from 71 per cent in 2007 to 62 per cent in 2012. The success rate for SSHRC's standard research grant -- now called the Insight Grant -- dropped from 33 per cent in 2007 to 27 per cent in 2012. For CIHR, the percentage of successful applicants for its open operating grant program is just 9 per cent in 2012, down from 22 per cent in 2007.

While providing inadequate support for basic research, the government has instead targeted new investments toward directed research that it alleges will foster commercial innovations. This is reflected in the overwhelming focus of the consultation paper on business innovation that simplistically equates scientific progress solely with short-term commercial outcomes. This approach reflects a dangerously shortsighted and narrow view of science that ignores the history of scientific advances. The discovery of X-rays, nylon, Teflon, GPS technology, informatics, superconductivity and medical imaging are just some of the innovations that emerged as the unanticipated results of basic research. The evidence clearly suggests that a narrowing focus on commercialization can stifle the creativity and unexpected discovery fundamental to basic research.

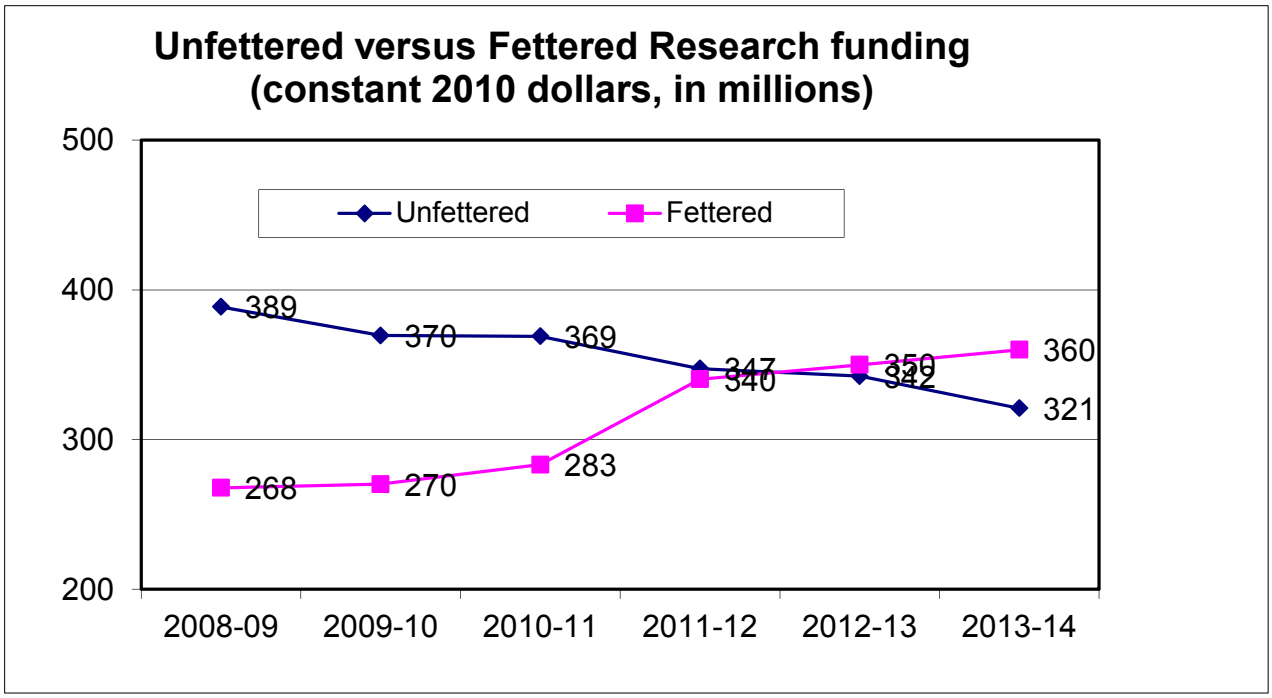
A narrow focus on applied commercial research can also distort the focus of scientific investigation in ways that run counter to the public interest. In the area of medical research, for instance, the obsession with commercial outcomes has encouraged an emphasis on minor modifications to existing drugs and devices, rather than fundamental explorations of the causes of illness and methods of prevention.

To encourage real scientific progress that will produce long-term benefits, the Canadian government needs to re-balance its research funding priorities by boosting support for basic research first. As a first step, CAUT recommends that the federal government substantially increase the base funding of the three granting councils to support basic research. At a minimum, funding should be restored to 2007-08 levels in real terms.

III. Ensuring the integrity and independence of public research

The challenge facing science in Canada today is not simply one of reduced funding. It is also about a change in how and what the government is funding. The federal government has increasingly earmarked and targeted funding to specific projects and institutions that it deems important, and has redirected funding in order to steer researchers into partnerships with industry. This has often been done with limited consultation with the scientific community.

NSERC's shift in funding from basic research towards "fettered" industrial partnerships provides the clearest expression of this trend. In 2008-09, about 65 per cent of NSERC's research project funding was dedicated to basic or "unfettered" research. In the current fiscal year, the situation has nearly reversed, with 53 per cent of total funding now "fettered"[i].



Source: *Calculations based on NSERC Departmental Performance Reports, Budget 2012 and Budget 2013*

Meanwhile, the federal government has also changed the composition of the boards of the granting councils, appointing industry and political figures at the expense of scientific experts. Public agencies such as the National Research Council are seeing their mandate narrowed and explicitly tied to industrial interests.

Canada's university-based researchers remain deeply troubled by the increasing tendency of the government to target research funding and bypass the peer review process. Rather than allow the scientific community to determine what research is most worth funding, the government has increasingly required the granting agencies to direct funding toward industrial collaborations, specific disciplines or topics determined by the government. The government has also used recent budgets to direct specific funding to specific research facilities. In the last two federal budgets alone, all new money for research has been directed at industry-university partnerships.

The focus on business innovation and the commercialization of research, with the emphasis on requiring government scientists and university-based researchers to collaborate with industrial partners, can also undermine the integrity of scientific research. In a recently published CAUT report examining 12 major collaboration agreements involving universities, industry and governments in Canada, we found

that seven agreements provide no specific protection for academic freedom, and only one requires the disclosure of conflicts of interest. Only five of the agreements give academic researchers the unrestricted right to publish their research findings and just half provide that the university maintains control over academic matters affecting staff and students.[ii]

As John Polanyi, Canada's most prominent Nobel laureate has warned, when governments or industry try to direct scientific inquiry, rather than allowing the scientific community to do so through its rigorous peer-review system that protects the integrity of their work, our scientific horizons shrink and our future is diminished. A new science strategy must protect the integrity and independence of scientists' work. To achieve this, CAUT recommends the following:

- All scientific research funded through the granting agencies should be subject to peer-review with priorities determined by the scientific community.
- The three federal granting agencies should be made more arms-length from government and the membership of their boards should include more representation of scientific experts.
- Canadians and their elected representatives also need unbiased and non-partisan advice on science policy. The Office of the National Science Advisor had been designed to fill this role, however imperfectly, until it was eliminated in 2008. One potential new approach would be to create a Parliamentary Science Officer (PSO), an independent officer of the Library of Parliament who would report to the Senate and the House of Commons. The PSO would provide independent advice and analysis to Parliament about the adequacy and effectiveness of the nation's scientific policies, priorities, and funding.
- In supporting collaborations with industry and universities, the federal government should require all partners to adopt a clear set of guidelines that provide protections for academic freedom and the free and open exchange of ideas and discoveries, safeguards against conflicts of interest, requirements to ensure transparency, and guarantees that academic staff play the central role in decisions regarding the initiation, development, implementation, monitoring, and assessment of collaborative agreements.

IV. Supporting Government Science in the Public Interest

> *Since Prime Minister Stephen Harper's Conservative Party won power in 2006, there has been a gradual tightening of media protocols for federal scientists and other government workers.*

> *Researchers who once would have felt comfortable responding freely and promptly to journalists are now required to direct inquiries to a media-relations office, which demands written questions in advance, and might not permit scientists to speak. Canadian journalists have documented several instances in which prominent researchers have been prevented from discussing published, peer-reviewed literature. Policy directives and e-mails obtained from the government through freedom of information reveal a confused and Byzantine approach to the press, prioritizing message control and showing little understanding of the importance of the free flow of scientific knowledge.*
>
> - *Nature 483, 6 (01 March 2012)*

CAUT is concerned about recent government actions that have compromised the independence, quality and reliability of data and evidence provided by government science. The federal government has placed unacceptable political controls on public science by muzzling its own scientists. It has gutted government science offices and agencies, and has increasingly politicized the research carried out by its departments and public agencies.

The government's restrictions on scientists' ability to speak freely about their research has earned international condemnation and tarnished Canada's reputation as an open society. To serve the public interest, government scientists must be free to speak publicly about their findings. Canadians have a right to know what the evidence uncovered and discoveries made by their scientists. There is no room in a democratic society for governments to censor or restrict the public's right to know.

Government science is also suffering as a result of the drastic elimination of scientific staff, programs and federal libraries at a time when sound science-based decision-making is needed more than ever. Canadians face major challenges that require sound scientific solutions including those related to climate change, energy demand, public health, and drug safety. Government departments and agencies, such as Natural Resources Canada, Environment Canada, Fisheries and Oceans Canada, Health Canada, Agriculture and Agri-Food Canada, Statistics Canada and the National Research Council have a vital role to play in confronting these challenges, but can only do so when they are adequately funded and free to pursue their work.

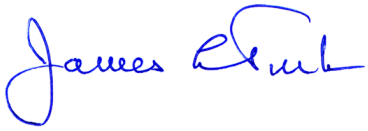
Similarly, funding cuts at Statistics Canada have adversely affected a significant portion of Canada's research community which relies upon the data produced by

the agency to conduct research across all scientific fields. A number of important surveys conducted by Statistics Canada have been eliminated, and the future of others is uncertain. The misguided decision to end the mandatory long-form Census has been condemned by virtually every statistician and social scientist in the country. Statistics Canada officials now concede that the change has compromised data integrity that will have a knock-on effect on other surveys that are essential for economic and social planning.

The federal government must re-invest in its own research programs and free its scientists to provide the public with reliable and independent scientific knowledge and advice. A new science policy has to ensure that the government cannot defund politically inconvenient research, as has happened in recent years in the area of climate science research with the closure of the Experimental Lakes Area, the Polar Environment Atmospheric Research Laboratory, and the Canadian Foundation for Climate and Atmospheric Sciences.

Respectfully submitted by:

Wayne D. Peters
President



James L. Turk
Executive Director

[i] The lack of transparency in Granting Council reporting means that it is impossible to disentangle definitively basic research from targeted research. The terms used in this section are "fettered" and "unfettered", reflecting the distinction that "unfettered" research is investigator-driven. The term "fettered" comes from former University of Toronto president David Naylor in a presentation to the Empire Club of Canada, March 7, 2013: http://www.president.utoronto.ca/secure-content/uploads/2013/03/David-Naylor-Empire-Club-Address.pdf.
Fettered research funding includes funding for NSERC's Research Partnerships area: Strategic areas, university-industry-government partnerships, and commercialization initiatives. Data for unfettered research funding is based on NSERC's Discovery Grant program.

[ii] Available at http://www.caut.ca/docs/default-source/academic-freedom/open-for-business-%28nov-2013%29.pdf?sfvrsn=4