

**TOWARDS A NATIONAL SCIENCE POLICY FOR CANADA**  
A SUBMISSION TO THE HOUSE OF COMMONS STANDING  
COMMITTEE ON FINANCE

2006 PRE-BUDGET CONSULTATION

Presented by the Partnership Group for Science and Engineering (PAGSE)

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**SUMMARY**

We recommend placing greater urgency on the development of a national Science and Technology (S&T) framework. This initiative is being led by Industry Canada in collaboration with the Department of Finance. A clearly enunciated S&T framework will reap positive rewards in terms of productivity, innovation, the attraction, training and retention of highly qualified personnel, and the quality of life of Canadians. Hence, it should be a priority for the federal government. Specifically, we propose that the Government of Canada:

- Evaluate the return to society on public investment in S&T in Canada and the efficacy of the investment mechanisms employed
- Implement the recommendations of the Expert Panel on Commercialization<sup>1</sup>
- Commission an external review of the roles, functions, assets and deficiencies related to research and development (R&D) in federal government laboratories
- Support measures that ensure the national capacity for continuous scientific monitoring, including the collection, long-term archiving and effective access to the data
- Charge Industry Canada with the funding and implementation of international S&T collaborations

**INTRODUCTION**

The Partnership Group for Science and Engineering (PAGSE), perhaps best known for the *Bacon & Eggheads* breakfast lecture series on Parliament Hill, is an association of more than 25 professional and scientific organizations. It reflects a diversity of science and technology interests in Canada, ranging from a focus on research, innovation and industrial capacity to stimulating science in academia and government, to monitoring S&T requirements for policy development. PAGSE is not a lobby group; rather it works

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<sup>1</sup> “*People and Excellence: the Heart of Successful Commercialization, Final Report of the Expert Panel on Commercialization*”, Government of Canada, 2006

in partnership with government to advance research and innovation for the benefit of Canadians.

In past briefs to this committee, PAGSE has highlighted opportunities and challenges facing Canada's scientific community, including the training of highly qualified personnel, private sector research investment, the need for national-level priority setting for government investment in S&T, the importance of a balanced national research capacity, the commercialization of innovation, and improving Canada's capacity to participate in international research. **While this submission continues to emphasize a number of these issues, PAGSE wishes to stress the need for greater urgency in the development of a national S&T framework, an initiative currently led by Industry Canada in collaboration with the Department of Finance.**

### **S&T CAPACITY**

Competing globally is fundamental to the Canadian economy and the Canadian way of life. It involves stimulating innovation, translating it into production at home and marketing production internationally. We are falling behind world trends in all of these areas. As recently stated by Kevin Lynch, Clerk of the Privy Council, in order to compete globally Canada must improve its productivity through the development and application of S&T<sup>2</sup>. Research and innovation capacity depends on factors that include a diverse pool of expertise, a propitious investment climate, and a capacity to turn innovation into economic outcomes within Canada. College and university systems must be flexible to seize opportunities and provide training in emerging fields to ensure the supply of essential highly qualified personnel. Provision of more human expertise must be accompanied by an increased capacity to turn innovation into economic activity, otherwise people, ideas and innovation will leave Canada. Moreover, our ability to attract highly qualified experts from other countries is being eroded as those nations mount their own programs. Balance between government, academic and private sector efforts requires the setting and understanding of clear priorities.

#### **A National S&T Framework:**

Canada must develop a coherent national S&T framework that will enable it to augment its competitive capacity. Such an initiative is being led by Industry Canada, in collaboration with the Department of Finance. However, we are concerned that the longer this process takes, the less likely it is that Canada will retain the brightest and the best, the confidence of industry, and such leadership as we currently have. Achieving a balance between the many competing S&T priorities facing government may complicate the task, but Canada's future depends on our ensuring that we are productive and globally competitive.

Canada has created an impressive number of S&T-related tools (e.g. Canada Foundation for Innovation, Canada Research Chairs, Genome Canada, Canadian Foundation for

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<sup>2</sup> Kevin Lynch, "*Canada's success is no accident, and it isn't a given*", Policy Options, Page 12-17, April-May 2006

Climate and Atmospheric Sciences, Canada Graduate Scholarships, and the Sustainable Development Technology Fund). It is now appropriate to “take stock”, and consider how these recent instruments fit with existing programs (e.g. Granting Agencies, Networks of Centres of Excellence, National Research Council) in addressing the research and innovation of this country. The Government of Canada needs to clearly articulate an accountability framework and to evaluate the return on its investment in S&T in order to set new priorities for future investments. However, Canada must not focus narrowly on applied or commercial benefits alone. It is critical to also recognise the potential value of the basic S&T that underpins Canada’s scientific effort.

### **Private Sector Participation in S&T:**

A strong national S&T base requires contributions from all sectors: academia, government and industry. Currently in Canada, there is an imbalance between them in terms of research and innovation capacity, as well as S&T infrastructure. Industry support for S&T research lags well behind other nations, especially the United States<sup>3</sup>, while fundamental questions regarding the difficulty of finding risk capital in Canada to exploit innovation opportunities need to be addressed. For example, the Expert Panel on Commercialization has evaluated this short-fall and expressed concern that in terms of expansion-stage financing the average venture capital investment in a U.S. company is four times that invested in a Canadian company. The Panel has made a number of recommendations in this regard, including setting-up a *Commercialization Superfund*, a *Canadian SME Partnerships Initiative*, and a *Small Business Innovation Research Program*, as well as fiscal measures relating to angel investment and foreign venture capital. The Panel also recommends upgrading existing programs such as the *Industrial Research Assistance Program*<sup>4</sup>, *Ideas to Innovation*<sup>5</sup>, and the *Proof of Principle* program<sup>6</sup>, plus the introduction of a similarly commercialization-friendly program by the Social Science and Humanities Research Council (SSHRC). Moreover, the Canadian Manufacturers and Exporters have recently recommended the extension of the SR&ED Tax Credit program to cover the first stage of commercialization of new technologies<sup>7</sup>. Such a system would attract private venture capital and expansion capital for the commercialization of new technologies from around the world with a minimal amount of administrative expense and potential tax leakage. We would add that the government should establish a program to be a first adopter of innovative new technology and services, thereby materially assisting smaller companies in their bid for successful commercialization.

### **Federal R&D Capacity:**

In stark contrast to substantial public reinvestment in university-based S&T infrastructure through the Canada Foundation for Innovation (CFI), the Council of Science and

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<sup>3</sup> OECD, *Main Science and Technology Indicators 2002*: November 2005

<sup>4</sup> IRAP, National Research Council (NRC)

<sup>5</sup> I2I, Natural Sciences and Engineering Research Council (NSERC)

<sup>6</sup> PoP, Canadian Institutes of Health Research (CIHR))

<sup>7</sup> Hon. Perrin Beatty, President and CEO of the Canadian Manufacturers and Exporters, communication to Hon. Jim Flaherty, Minister of Finance, July 17, 2006

Technology Advisors (CSTA) recently found that support for government science has been static or declining over the last quarter century<sup>8</sup>. Thus, the ability of federal Science Based Departments and Agencies (SBDAs) to address their mandates has been weakened. One investment required is new state-of-the-art infrastructure across the full spectrum of government S&T. Achieving a coordinated government-wide balance between the priorities and competing demands of federal SBDAs during capacity restoration will be a key challenge.

### **Long-Term S&T Monitoring Capacity:**

Many fundamental aspects of S&T are underpinned by stable, medium- to long-term programs of scientific monitoring, data collection, and reliable data archiving and access. In addition, some fields, such as satellite-based remote sensing, are experiencing an unprecedented data flow that places enormous strains on archiving and access capacities. These aspects of long-term monitoring capacity are beyond the mandate, capacity and interest of university- or business-based researchers. Across the country, there are wide gaps in basic scientific knowledge: e.g. environmental baselines, to cite but one example. On the one hand, investment in basic monitoring of scientific variables by the federal government has continued to decline, except in response to crises such as the Mountain Pine Beetle infestation in central B.C. On the other hand, there has been an upsurge in interest in non-renewable resources such as oil and gas, minerals, and gas hydrates that will require environmental, political and cultural assessment. Decisions will need to be based on sound science, scholarship and public policy. Responses based on inadequate monitoring and last-minute science will carry a high degree of risk to the economy, to Canadians and their environment, and will compromise future socioeconomic development.

### **International S&T Collaboration:**

Canada's capacity to participate in international S&T programs is currently weak and dispersed. Enabling strong participation would allow Canada to access resources, expertise and infrastructure that would otherwise be unattainable for our scientists and engineers. However, this also requires timely decisions in order for Canada to play a leading role in such initiatives. Yet in many fields of scientific endeavor there are no mechanisms to secure initial funding, e.g. through the granting councils. An innovative form of seed "risk capital" is essential for Canada to establish or maintain its international credentials and to benefit from S&T on the world scene.

## **RECOMMENDATIONS:**

### **Accelerate the development of a new, forward-looking national S&T framework**

Specifically, we propose that the Government of Canada:

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<sup>8</sup> CSTA, *LINKS: Linkages in the National Knowledge System* (February 2005)

- **Evaluate the return to society on public investment in S&T in Canada** and the efficacy of the investment mechanisms employed in order to obtain a clear understanding of the value received for investments already made, whether the latter be in basic or applied research.
- **Implement the recommendations of the Expert Panel on Commercialization and the Canadian Manufacturers and Exporters** with the intent of stimulating business participation in S&T innovation and development.
- **Commission an external review of the roles, functions, assets and deficiencies related to R&D in federal government laboratories** in order to develop a long-term vision and provide mechanisms for improved horizontal working relationships and national S&T infrastructure renewal.
- **Support measures that ensure long-term monitoring, data collection and archiving capacity**, e.g. for environmental baselines, to provide Canadians with the information required to make and support long-term policy decisions.
- **Charge Industry Canada with the funding and implementation of international S&T collaborations**, including establishment of an EU Opportunities Fund to empower Canadians to partner on the EU Framework Programme for Research and Technology Development.