

Fall/Winter 2004

CSTA Update

Fostering excellence in government S&T

CABINET APPROVES RELEASE OF LINKS REPORT

On December 16, 2004, Cabinet approved public release of the CSTA's report *Linkages in the National Knowledge System (LINKS)*. The report, undertaken at the behest of the former Cabinet Committee for the Economic Union (CCEU), recommends actions that the federal government can take to foster effective S&T linkages among science-based departments and agencies (SBDAs) and with industry and academia. It addresses linkages across the broad spectrum of the S&T enterprise, including research and development (R&D), related scientific activities (RSA) and the science-policy interface. The report focuses on fostering a linked national science and innovation system characterized by integration, coordination and inter-connectivity among all of the players, as well as promoting individual S&T collaborative initiatives at the program and project level.

S&T is playing an increasingly critical role in informing government policy and decision making on a wide range of issues that affect Canada's social and economic well-being, from global warming to genetically modified organisms, to terrorism and other threats to human and economic health, such as SARS and BSE. Increasingly, these issues are complex and multi-dimensional in nature, crossing or transcending the traditional boundaries associated with institutions, sectors, scientific disciplines and geopolitical borders. To respond effectively, the CSTA maintains, Canada needs a mature science and innovation system characterized by S&T linkages. Through linkages, the government can engage the full capacity of the innovation system and draw on the most appropriate expertise, experience and resources wherever they reside in Canada. This will enable the government to more effectively identify, address and resolve these issues that affect the lives of Canadians.



Message from the Deputy Chair

It's with great pleasure that I assumed the role of the Deputy Chair of the CSTA in June 2004. CSTA members are uniquely positioned as senior external advisors, with direct links to the advisory boards of the science-based departments and agencies.

Our report on federal S&T linkages, soon to be published, is particularly timely. SBDAs have been exploring means to facilitate greater collaboration and integration both among themselves and with academia and industry. The appointment of the National Science Advisor provides a good opportunity to promote a linked federal, and indeed national, S&T system.

Building on our body of work to date, we have an exciting year ahead of us as we tackle our new topic - looking at the implications of the changing S&T enterprise, both nationally and internationally, for the management of federal S&T in the 21st century.

This is a critical time for government S&T, and I believe that the CSTA can play an important role in contributing to federal S&T excellence. I look forward to a challenging and rewarding year.



Dr. Alan E. Winter
Deputy Chair
CSTA

LINKS (cont'd)

But achieving the full benefits of S&T linkages will require overcoming a number of key challenges. Chief among these, according to the CSTA, is the vertical system of governance which characterizes the Canadian system. The system is dominated by traditional vertical departments which are structured largely to provide S&T-based solutions to issues within their specific jurisdictions. The accountability, resource allocation and reward structures and processes characteristic of this type of vertical system lack the incentives, flexibility and responsiveness that facilitate horizontal S&T.

The CSTA believes that Canada's social and economic well-being depend increasingly on the government's ability to use S&T linkages effectively and efficiently. In the *LINKS* report, the Council offers recommendations to promote a linked federal S&T system and to foster collaborative S&T initiatives.

The *LINKS* report is currently in production. The report will be available at the end of January 2005 from the CSTA Secretariat and on the CSTA web site, at www.csta-cest.ca. Supporting background consultants' studies will also be available on the web site. †

SPOTLIGHT ON REPORTS

Cabinet Approves Federal S&T Framework

The new framework for federal S&T, *In the Service of Canadians: A Framework for Federal Science and Technology*, was approved by Cabinet on December 16, 2004.

The framework is intended to guide the effective conduct and management of federal S&T. Initiated as a response to the CSTA's *BEST, STEPS* and *EDGE* reports, the framework is also, more broadly, a response to the wide-ranging challenges and opportunities facing the federal government in carrying out its S&T activities. The framework is an enduring statement of the government's directions on S&T management and is designed as a flexible tool to allow incorporation of new elements as learning continues and new policies and practices emerge.

The framework consists of three related elements.

CSTA's New Topic

With the completion of the *LINKS* report, Cabinet has asked the CSTA to continue building on its body of work by next examining the implications of the changing S&T enterprise, nationally and internationally, for the management of federal S&T in the 21st century. The CSTA will initiate work on this new topic at its next full-council meeting, on January 14, 2005 in Gatineau, Quebec.

The way in which people conduct, understand and apply S&T - how we generate, access, communicate and use information and knowledge - has changed and continues to change. At the same time, the S&T-based issues affecting Canada's social and economic well-being are increasingly complex and multi-dimensional in nature and demand correspondingly interdisciplinary responses. The CSTA proposes to explore in depth the implications of these changes for the management of federal S&T in the 21st century and provide recommendations on how the government should respond in managing its S&T and in positioning itself as a key actor in the national science and innovation system. The intent is to ensure that the government's S&T system can support future policy and regulatory decision making requirements and provide effective S&T responses to future challenges and opportunities.

These articulate the unique and essential role of federal S&T; present principles and corresponding commitments to guide the conduct and management of federal S&T activities; and identify the necessary features of an environment that promotes and supports federal S&T.

The framework applies to all federal departments and agencies and their employees involved in the direct planning, conduct, management, policy development, communication and use of federal S&T. It may also be applied, as appropriate, to the management of government funding of external S&T performed on behalf of the federal government.

See *Framework Approved* on page 4

MEMBER NEWS

The CSTA thanks outgoing member **Brian Giroux**, whose term on the Council recently expired. Brian was appointed to the CSTA in July 1998 by Fisheries and Oceans Canada. He chaired the sub-committee responsible for producing the *STEPS* report, was a member of the sub-committees that took the lead on the *BEST* and *EDGE* reports, and worked with the Council in producing the *LINKS* report. Brian is Executive Director of the Scotia Fundy Mobile Gear Fishermen's Association.



The CSTA welcomes Fisheries and Oceans' new appointee to the CSTA, **Ron Bulmer**. As an independent consultant with expertise in fisheries and seafood issues, Ron provides services to government and industry in strategic planning, marketing, international trade and association management. He served for twenty years with the Fisheries Council of Canada and, as its president, was responsible for representing the majority of seafood firms in Atlantic Canada, Ontario and British Columbia engaged in the growing, harvesting, processing and marketing of fish and seafood. Prior to the Fisheries Council, Ron served as President of the Canadian

Association of Fish Exporters, from 1978 to 1983, where he was responsible for the development of world markets for Atlantic Canada seafood products.

The CSTA also thanks outgoing member **Denis Brière**, whose term on the Council recently expired. Denis was appointed to the CSTA in October 2001 by Natural Resources Canada. He served on the sub-committee responsible for the *EDGE* report, and worked with the Council in producing the *LINKS* report. Denis is Dean of the Faculty of Forestry at Laval University.

The CSTA also thanks outgoing member **Judith Hall**, whose term on the Council recently expired. Judith was appointed to the CSTA in September 2001 by Health Canada. She served on the sub-committee which took the lead on the *EDGE* report, and worked with the Council in producing the *LINKS* report. Judith is a professor of pediatrics and medical genetics at the University of British Columbia. An announcement of Judith's replacement on the CSTA is pending.

The CSTA also bids farewell to **Peter Victor** and thanks him for his service on the Council. Peter was appointed to the CSTA in July 2002 by Environment Canada, and worked with the Council in producing the *LINKS* report. Peter is a professor in the Faculty of Environmental Studies at York University.



The CSTA welcomes Environment Canada's new appointee to the CSTA, **Jim Germida**. Professor and Head of the Department of Soil Science, University of Saskatchewan, Jim received his undergraduate training at the University of Maryland and his Ph.D from Pennsylvania State University. Jim's research focus is on microbial biodiversity and community dynamics of microorganisms in agroecosystems (specifically on the impact of plant species, crop rotations and crop breeding programs on microbial biodiversity in soil), and the use of plant-microbe systems for phytoremediation of contaminated soil ecosystems. He has been the

Co-editor of the Canadian Journal of Microbiology since 1993 and a member of the Editorial Board for Arid Land Research and Management since 1990. He served as the President of the Canadian Society of Microbiologists in 2001 and as Past-President in 2002. He has served, and continues to serve, on a number of national and international grant review panels and government commissions, and has published over 100 refereed journal articles and book chapters.

SPOTLIGHT (cont'd)

Framework Approved (cont'd)

The framework represents the culmination of months of consultation and collaboration within the interdepartmental S&T community. Each department and agency will be responsible for the implementation of the framework within its organization. The Minister of Industry will lead a coordinated, government-wide effort to monitor the effectiveness of the framework in strengthening federal S&T and will report back to Cabinet in three years on progress towards this goal.

For further information or a copy of the framework, contact Industry Canada's S&T Strategy Directorate at (613) 993-7589. †

ALSO OF INTEREST

Cabinet Approves Funding for Canadian Academies

On December 16, 2004, Cabinet approved \$35 million in operational funding over the next 10 years for the Canadian Academies of Science (CAS). The CAS will contribute to sound governance by providing a clearer picture of complex S&T issues. This will support informed decision making by government, industry and the public on a wide range of issues that impact on the social and economic well-being of Canadians.

Prime Minister Paul Martin announced the government's funding support for the CAS in his October 6, 2004 Reply to the Speech from the Throne. The CAS mandate is two-fold:

- to provide a standing capacity for credible, independent, expert assessments of the science underlying pressing issues and matters of public interest; and
- to provide a recognized, unified voice for Canada on behalf of the sciences, particularly in international, inter-academy fora.

The CAS will complement the work of existing S&T advisory bodies. Advisory bodies, such as the CSTA, the Advisory Council on Science and Technology (ACST) and the Canadian Biotechnology Advisory Committee (CBAC), provide recommendations concerning specific courses of action. The CAS, through its expert

panels, will provide assessments of what is known and what is not known about the science underlying key public policy issues. These assessments will establish the "facts" about a particular issue, examine the validity of the evidence informing the issue, clarify areas of concurrence, divergence and uncertainty where they exist and define those questions that remain unanswered. The government and others can then use this information to inform deliberative processes and decision making on key issues.

The Minister of Industry and the National Science Advisor will work closely in identifying priority issues for assessments, according to their importance to the federal policy agenda and their implications for the health, safety, environmental and economic well-being of Canadians. Demand for assessments is expected to come largely from federal science-based departments and agencies, with some requests expected from Parliament, provincial governments or CAS members.

Founding members of the CAS include The Royal Society of Canada, the Canadian Academy of Engineering and the Canadian Institute of Academic Medicine. †

The Knowledge and Development Challenge from the Prime Minister

On October 15, 2004, Deputy Chair Alan Winter was joined by four other CSTA members - Peter Johnson, Art Collin, Martin Taylor and Peter Victor - at a roundtable hosted by Canada's National Science Adviser, Dr. Arthur Carty, on the R&D challenges for development.

As part of his mandate, Dr. Carty has been challenged by the Prime Minister to tackle the commitment in the February 2004 Reply to the Speech from the Throne that Canada devote no less than 5% of our R&D investment to a knowledge-based approach to development assistance for less fortunate countries.

The October 15 roundtable brought together about 40 participants from the federal

UPCOMING EVENTS

- The CSTA will hold a full-council meeting on January 14, 2005 at the Hilton Lac Leamy in Gatineau, Quebec. The focus of this meeting will be initiation of the Council's new topic of study, "Implications of the Changing S&T Enterprise for the Management of Federal S&T".
- On January 11-13, 2005, there will be a Federal S&T Forum at the Hilton Lac Leamy in Gatineau, Quebec. The theme of the forum is Moving from Collaboration to Integration. Organizers are expecting approximately 350 participants from science-based departments and agencies and affiliated representatives from industry and academia (such as CSTA members). Anticipated outcomes include: development of a common understanding of S&T integration; identification of barriers to S&T integration and strategies to overcome them; and initiation of an action plan or framework for S&T integration.
- In conjunction with the Forum, a Pre-Forum Workshop on Science Convergence is scheduled for January 11, 2005, also at the Hilton Lac Leamy. This workshop will present leading-edge developments in S&T convergence and raise awareness about the potential implications of these developments for Canadian S&T.
- As part of his mandate related to R&D challenges for development, National Science Advisor Arthur Carty will attend a workshop on research and capacity-building in Africa in London, England in early February 2005. Canada - with IDRC as the lead - is working with the United Kingdom to develop the workshop in the context of the G-8 Summit scheduled for July 2005 in the UK. The work of the Commission for Africa that was appointed by Prime Minister Blair offers another opportunity for Canada to demonstrate leadership in meeting Prime Minister Martin's challenge to devote no less than 5% of our R&D investment to a knowledge-based approach to development assistance for less fortunate countries.

ALSO OF INTEREST (cont'd)

NSA Roundtable (cont'd)

government, research agencies and councils, the private sector and universities to engage in a dialogue around this subject. Discussion addressed questions such as: How best can we mobilize our assets in knowledge production to assist the needs of the developing world? What are we doing now? What incentives are required to help focus our approach in this area, and what are the key instruments that we have in place to engage this challenge both in Canada and with our partners around the world?

Several points emerged from the roundtable, including the following:

A strategic framework or policy map of the issues should be developed. It must be explicit about: the objective and rationale for this exercise; the definition of developing countries and articulation of their needs; the differentiation between types of developing economies and how this maps on to Canadian policy objectives in trade, investment, diplomacy and economic and social

development; the means to assess the gaps in our policies; the implementation mechanisms to be considered; and the means to communicate this to the various Canadian sectors of interest.

Canadian companies, especially SMEs, are facing both opportunities and barriers in developing R&D partnerships and technology-based market opportunities with the South. We need to explore new arrangements for technology partnerships with emerging markets, in particular India, China, South Africa and Brazil. It was also suggested that Canada "internationalize" some of its key domestic R&D programs to link with opportunities in the South, such as the Canada Research Chairs, Networks of Centres of Excellence (NCEs) and research partnerships in health and the biosciences.

For more information on Dr. Carty's work in delivering on this mandate from the Prime Minister, contact Paul Dufour of the National Science Advisor's Office, at 613-948-6669 or pdufour@pco-bcp.gc.ca. †

ALSO OF INTEREST (cont'd)

Advisory Council on Science and Technology (ACST) Update

The Prime Minister's Advisory Council on Science and Technology (ACST) complements the CSTA's mandate by providing broad-based policy advice on research and innovation focussed on the university and business sectors. The Deputy Chairs of the CSTA and the ACST each sit on the other council in an ex officio capacity in an effort to enhance coordination and cooperation between the two advisory bodies.

During 2004, the ACST moved forward on several inter-related issues of strategic importance to Canada. These projects flowed from the set of four thematic policy recommendations submitted to the Prime Minister in December 2003 and from the request from then Minister of Industry, Honourable Lucienne Robillard, for advice on commercialisation, community innovation and research impact assessment.

The projects undertaken are briefly described below:

1) Seed and Pre-Seed Stage Venture Capital

A roundtable was held in the spring with experts in this field. The discussions and ensuing advice to government were captured in a comprehensive report that was released to the public domain in the fall 2004.

2) Community and Regional Development

A small group of experts from Canada, Mexico, the United States and Scotland was brought together to explore new approaches to regional and community development, including the role of clusters in supporting economic development and competitiveness.

3) Human Capital Development

The ACST maintained ongoing research and contacts with experts in this area, with an emphasis on issues related to highly qualified people. In the fall 2004, the council organized a small roundtable in Calgary on skills in the natural resource sector at the conclusion of a national conference on this subject.

4) Research Impacts: Evaluation Framework and Indicators

Initial work was conducted by the ACST Secretariat to outline this issue, followed by two external contracts to further investigate and develop a framework. This work was completed in December.

5) Federal-Provincial-Territorial Innovation Councils

During the second half of 2004, the ACST initiated contact with provincial and territorial external advisory councils to identify the potential and willingness to collaborate on mutual priorities and projects. By year-end, concrete steps had been achieved in identifying mutual interests and a willingness to share information and explore future collaborative work.

6) Government Procurement & Market Demonstration

The ACST believes that this topic has potential to help advance technological innovation and its commercialized applications in society and the marketplace. A terms of reference was prepared at year-end, for the purpose of pursuing an external study of international practices and new directions by national governments.

7) Innovation Imperative & Economic Indicators

The ACST is currently working on developing an indicator and conceptual framework that will reveal the true nature of the competitive forces that are impinging on Canada's global competitiveness.

At its November 2004 meeting, two distinguished and longstanding members resigned from the ACST: Martha Piper (President, University of British Columbia) and René Simard (Past Rector, Université de Montréal). Drs. Piper and Simard were highly-valued members of the ACST, contributing their experienced insights and wisdom to helping advance Canada's growth and development. They will both be missed.

For more information, contact the ACST Secretariat at (613) 991-5616. †

FAST FACTS

The *2003 Science and Technology Data* booklet was released in October 2004 by Industry Canada. The booklet offers readers a one-stop source for pertinent S&T information related to Canada's economy. It includes data related to Canada's standing among other OECD countries in areas such as gross domestic expenditure on research and development (GERD), the federal government's share of financed and performed R&D, Canada's business enterprise expenditure on research and development (BERD), Canada's higher education expenditure on research and development (HERD), and data on population growth and education levels. For a copy of the 2003 S&T Data booklet, contact Industry Canada's S&T Strategy Directorate at (613) 993-7589.

FROM THE FRONT LINE

From the Front Line provides the opportunity for SBDAs to share with the S&T community how the Council's work has influenced their management of S&T. If you are interested in submitting an article for publication in CSTA Update, please contact the CSTA Secretariat.

DRDC Strategy Becomes Closely Aligned to CSTA Reports

- Submitted by Defence R&D Canada, an agency of the Department of National Defence

Defence R&D Canada (DRDC) is the national authority for providing S&T leadership to advance, transform and maintain Canada's defence and security capabilities. Driven by a rapidly changing national and global security environment, DRDC synchronizes its activities with the Canadian Forces (CF) and the Department of National Defence (DND), to deliver excellence in leading-edge research, technology and analysis so that the CF can respond to the new realities of military and security operations and plan for the future.

Realizing the benefits of Canada's investment in research is one of the priorities of the federal government. Enhancing the flow of discoveries, inventions and new concepts from laboratories into commercial products, processes and services will help to bridge the gap between business and research communities. As one initiative towards bridging this gap, the DRDC six regional research

centres are establishing themselves as innovation hubs through their business development activities, supporting the CSTA concepts in the *BEST* report of alignment, linkages and excellence.

The CSTA recommends that federal S&T be built on effective, collaborative relationships. In this theme, the hubs will foster partnerships, pooling of resources, sharing of facilities and networking with the private sector, government units and universities in the region. The hubs will provide integrated capabilities and services from R&D, testing, evaluation and engineering, to technology exploitation by private sector partners. For DRDC, the rapid transition of S&T into the defence and security capability involves engaging industry early in technology insertion and spiral development, moving away from the traditional linear process for procurement to an evolutionary approach taking into account end-to-end procurement. Through timely commercialization, a synergy can be achieved between Canada's defence/security objectives and its economic goals. Results expected are economic benefit at the national level and the creation of sustainable employment.

The CSTA series of reports are providing DRDC with a thoughtful analysis of the evolving context of federal S&T. The CSTA reports note rapid changes in S&T knowledge and capacity world-wide, which supports DRDC's strategy of international linkages to key players such as the NATO Research and Technology Organization, and bilateral and multilateral collaborations with the United States, the United Kingdom, Australia, France, the Netherlands and Sweden. DRDC also played a key role in developing an international R&D strategy for network-enabled warfare. The Assistant Deputy Minister, Science and Technology, is leading the update of the NATO Research and Technology Strategy to reflect the changed defence and security environment.

DRDC continues to lead in national defence and security by connecting Canada's national security needs with the established expertise of DRDC programs. The Chemical, Biological,

See *DRDC* on page 8

FRONT LINE (cont'd)

DRDC (cont'd)

Radiological and Nuclear Research and Technology Initiative (CRTI) is one such initiative, which has become a model for leveraging expertise, S&T delivery and horizontal partnering in the federal government. Its partners include 17 federal departments and agencies, as well as industry, academia and emergency response organizations. This program supports the principles in *BEST* that recommend a more horizontal approach to federal S&T, looking for a multi-stakeholder approach.

DRDC developed an initiative to articulate its strategy and to put in place a system to facilitate the management and execution of that strategy. The DRDC Strategy Map, closely aligned with the DND/CF Strategy Map, is built upon four perspectives: *Customer*, *Value for Money*, *Internal* and *Foundation*. Each perspective is associated with two or three strategic objectives, areas in which DRDC must excel to realize its mission. The Strategy Map forms the basis of DRDC's performance management framework with performance indicators for each strategic objective. Through it, the relevance and health of the organization is monitored on a regular basis. This Strategy Map combines many of the principles contained in the CSTA reports, such as *BEST* (metrics and reporting), *STEPS* (pillars – quality, relevance, transparency and openness), *EDGE* (human resource policies and practices conducive to the conduct of modern science) and *SCOPE* (effective communications).

DRDC has a tradition of excellence in defence science and a commitment to uphold its position as Canada's leading defence and national security S&T agency. Our continued success depends on influencing and aligning with government policy and strategy, strengthening our connections with those who use the results of our work, and solidifying strategic linkages with our national and international partners. The key to our continued success is excellence in an S&T portfolio that is aligned with advances in technology, changes in the defence and security environment and the CF agenda for transformation.

For our strategy, visit http://www.drdc-rddc.gc.ca/publications/lfsa/lfsa_e.asp †

The CSTA is the external advisory body established in 1998 to provide advice to the federal Cabinet on the strategic management of the Government of Canada's internal S&T enterprise.

The CSTA consists of approximately 22 representatives from industry, academia and not-for-profit organizations, and reflects the diversity of S&T-based disciplines. Council members are appointed by ministers of science based departments and agencies and are drawn predominantly from the external science advisory bodies that counsel these SBDAs.

For more information about the CSTA and for copies of its reports, please visit the CSTA Web site or contact the Secretariat:

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