



## CANADIAN SCIENCE POLICY CONFERENCE

Published on *Canadian Science Policy Conference* (<http://cspc2013.ca>)

> Conference Themes

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### **Emerging Trends in International Trade and Diplomacy: The Role of Science and Technology**

The integration of science and technology (S&T) with international trade and diplomacy is emerging as a strategic opportunity. Science and technology have fostered global relationships through research hubs and innovation networks in both developed and developing countries. International partnerships are now a necessity for innovation and for the advancement of science and technology; they have also become a major component of international trade. Science and technology is increasingly being recognized as a new and effective tool in diplomacy, international relations and trade. The increasing level of S&T involvement in international trade and diplomacy has led to bi-lateral S&T agreements between governments. Science and technology are being considered as major mechanisms for socio-economic development. This is why developing countries as well as emerging markets are seeking more collaboration in these areas.

For Canada, the potential benefits of integrating S&T with international relations and trade are a matter of national interest. For example, Canada assumed chairmanship of the Arctic Council in 2013—a prime example of a science diplomacy opportunity. Canada's international S&T ties contribute to its overall diplomacy and trade with other countries.

This CSPC 2013 theme seeks to generate discussion to address both challenges and opportunities for S&T in trade and diplomacy including:

- What is the economic impact of S&T in building successful bilateral and multi-lateral relationships? What is the role of S&T in diplomacy around the world? How might these opportunities shape the future?
- How can Canada ensure the engagement of S&T in its approach to international trade?
- S&T has contributed to changing economic conditions in the developing world. How might Canada leverage its resources to benefit from contributing to this shifting landscape?
- What leadership is shown by the international community to use S&T to improve the well-being of people, and to address some of the important challenges facing our world today, both locally and globally? What could Canada be doing to contribute more strongly?

### **Private Sector R&D and Innovation: New Realities and Models**

The level of Canadian private sector research and development (R&D) has been scrutinized in the past decade. Several assessments have indicated that Canada's R&D spending/activities rank low compared to other OECD countries – resulting in a negative impact on innovation and productivity. The 2011 report by the Expert Panel on Federal Support for R&D included six sets of recommendations, some of which are being implemented, while other recommendations are still being debated.

This CSPC 2013 theme focuses on the challenges facing private sector R&D, given the realities of our time: economic austerity, rapid technological advancement, emerging R&D powerhouses, and extensive global competition. It encompasses a number of issues:

- What are the impacts of Canadian science and technology (S&T) policies and programs on the level of private sector investment in R&D? How can they encourage private sector returns on R&D?

- How could investment in private sector R&D be best supported by private equity, venture capital, institutional financing, and public funding?
- What are the roles and responsibilities of the private sector, academia, and government in shaping an efficient innovation ecosystem? What are the roles of intermediaries in the innovation system? Should their role be revisited?
- How could Canada become a more attractive environment for multinational R&D, as well as becoming an international research hub?
- Does Canada's IP regime require an upgrade to attract more investment and encourage international collaboration?
- What might increase the level of collaboration between the private sector and:
  - the academic sector?
  - international institutions and companies?
- Traditionally, private sector investment tends to occur closer to commercialization, whereas public sector investment is assumed to support the earlier stages of R&D. Is this assumption still valid in today's global and interconnected economy? What are the goals and objectives of R&D in the private sector compared with those in the public sector?
- To what degree do private sector entities collaborate? How can they leverage available data from external sources?

## **Communicating Science and Technology**

“We have designed our civilization based on science and technology, and at the same time arranged things so that almost no-one understands anything at all about science and technology—this is a clear prescription for disaster.” – Carl Sagan

Science and technology communication is used to shape, translate and deliver knowledge to a diverse range of audiences including other scientists, innovators, interest groups, the general public, government officials, and politicians. Communicating science in an increasingly complex, changing, and interconnected world has itself become a science.

Good science and technology communication is crucial for innovation to occur. This occurs through the communication of ideas, concepts, problems and solutions among representatives of the public and private sectors, academia and NGOs, and society at large.

There is unprecedented demand for evidence-based knowledge to inform public policy, support regulation, and facilitate trade. Communicating science with the general public has been growing through initiatives such as Café Scientifiques, mini medical schools, and on-line citizen science projects. No matter which communication medium is used, the multi-directional flow of information between knowledge-holders and knowledge-seekers is essential.

This CSPC 2013 theme will explore a range of topics related to science and technology communication, including:

- What initiatives encourage scientists and innovators to engage citizens in joint projects?
- How do we ensure citizens are informed about science and how do we communicate science more effectively to them?
- How is science journalism changing?
- How has social media changed science communication?
- How is science being communicated with politicians and how is the role of science advisors evolving?
- How is knowledge mobilization and management being applied in Canadian universities and other public institutions?
- What are the challenges and opportunities for open access data sharing? How might the future of published science be affected by open access data sharing?
- What are best practices in the communication of risk and uncertainty?

## **Graduate Studies and Research Training: Prospects in a Changing Environment**

Science and technology (S&T) capacity in the form of highly qualified and skilled personnel (HQP) and infrastructure are essential to increasing S&T performance. The number of HQP can be increased either through the training of graduate students (the focus of this theme) or through immigration. Although post-doctoral and doctoral graduates represent only a fraction of the Canadian workforce, they have a significant impact on Canada's long-term economic prosperity due to their contributions to innovation and productivity growth.

The 2012 Council of Canadian Academies State of Science and Technology in Canada report concluded that while Canada has the largest number of post-secondary graduates per capita in the OECD, it is not translating this into high numbers of doctoral graduates who will conduct S&T in the future. In 2011, the Science Technology and Innovation Council of Canada documented comparatively high unemployment rates for doctorate holders. Innovation is considered to be a key to Canada's long-term economic and social success; however, this requires HQP that can transform technical knowledge into societal benefits as well as products and services in the global marketplace.

Many countries are grappling with the idea of restructuring the PhD as training for high-level positions in careers outside academia.

Under this theme, CSPC 2013 looks to discuss the intersection of S&T policy with advanced education policy, a discussion that requires academia, government, and private industry involvement. Topics to be explored include:

- How does S&T policy need to be strengthened to facilitate and enhance the training and development of the next generation of graduate students and postdoctoral fellows?
- Is Canada training the appropriate number and type of graduate students and researchers for technical, entrepreneurial, clinical or applied fields outside of academia? What can be done to prepare PhD holders and post-doctoral fellows for careers outside academia?
- How can the training environment be designed to elicit innovation and commercialization, while preserving the exploratory nature of scientific research?
- What does the rise in trans-disciplinary degrees, global networking, and online education mean for our current academic model? Is the current model outdated?
- Is Canada able to meet its needs for research and innovation on northern issues, given that it does not have graduate programs situated in the three Canadian territories?

## **Emerging Issues in Canadian Science Policy**

With an ever evolving S&T, innovation, and policy landscape, this theme examines issues which may have been nascent at the inaugural CSPC meeting five years ago, but which have since attracted significant interest and attention both at the national and international levels. Moreover, this theme will examine what has changed over the past five years in Canada and abroad, and help to frame the discussion of where the field of science policy may lead us five years from now.

This theme will include an examination of:

- How have programs and institutions reshaped the landscape? What gaps remain in that landscape?
- What are the critical policy issues that must be tackled today in order to foster dynamic science and innovation policies in five years time?
- What are the evolving interests and roles of the various levels of Canadian federal, provincial/territorial and municipal governments in science policy and innovation? How should the division of responsibilities and interaction between these levels of government be harmonized to benefit the research ecosystem in Canada?
- How are priorities established for large-scale S&T initiatives, missions, and facilities in Canada? What are good practices for optimizing their return on investment? What are the roles and responsibilities of stakeholders? How should they be governed, and when should funding programs be aligned?
- How can we best position Canada to lead, contribute to, and benefit from major international initiatives?

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