Federal approach to S&T ready to evolve

Keynote: Luncheon Session with Bruce Archibald
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Speaker: **Bruce Archibald**, DM Champion, Federal Science and Technology Community; President, Canadian Food Inspection Agency

Takeaways and recommendations

- ✓ Establish a framework for federal leadership on science and technology
- ✓ Create a federal S&T governance board that will bring coherence to Canada's S&T ecosystem
- ✓ Develop a streamlined approach to attracting and retaining talent in federal science initiatives
- ✓ Take further steps in optimizing open science for greater collaborative opportunities
- ✓ Develop new mechanisms for better collaboration between federal departments, between countries and with industry and academia
- ✓ Invest in government laboratories and S&T infrastructure

The policy issue: "We need to find ways to better integrate government science and technology with a broader science and innovation ecosystem," Archibald told CSPC delegates.

Rapid technological advancements combined with an unprecedented growth in global S&T capacity has created a perfect storm for collaboration. But to take advantage of these opportunities, Archibald said we must "identify barriers to collaboration and find innovative solutions to overcome them".

The options: The Deputy Minister Science & Technology Committee (DMSTC) conducted a review of internal federal science, engineering and technology across all science-based departments and agencies. The Report of the Expert Advisory Group on Government S&T, just recently made public, provides options and recommendations for the future delivery of federal S&T.

The report found that federal S&T is highly fragmented, uses outdated human resources tools, has aging buildings and equipment, and is poorly integrated into the national science and innovation ecosystem. The shortcomings are making it difficult for federal science-based departments and agencies (SBDAs) to attain economies of scale, work effectively with other S&T players, adapt to the rapidly changing nature of science and pull together a critical mass of shared capabilities that contribute value to the entire S&T ecosystem.

The report includes seven recommendations on how the effectiveness of federal S&T can be improved (see list). "The federal science and technology community is taking that analysis to heart as we work with the new government to implement its agenda."

Archibald added that efforts are already underway to take an "enterprise-wide approach to investments in government laboratories and other science and technology infrastructure."

Open science is another priority, particularly one that focuses more broadly than simply making data publicly accessible. "Even more benefit will come from ... science carried out and communicated in a manner that allows others to contribute and collaborate," he said, with all kinds of data being made freely available at different stages of the research.

While more collaboration between departments is needed, Archibald said there have been successes, such as Canada's leadership in fighting Ebola. "We developed a mobile laboratory with rapid diagnostic support which is now replicated around the world," he said.

Canada also developed one of the leading Ebola vaccine candidates, VSV-EBOV, currently in trials in Canada, the United States, Europe and Western Africa. Those collaborations are continuing with the World Health Organization and the government of Ghana.

"That collaborative spirit is also reflected in the government's genomics research and development initiative (GRDI)," said Archibald. This multi-departmental effort includes collaboration with universities and the private sector. Launched in 1999, the GRDI provides $19.9 million annually to eight departments and agencies, including the Canadian Food Inspection Agency, Health Canada and Agriculture and Agrifood Canada (AAFC).

He said GRDI projects are already producing results. A team led by the Public Health Agency of Canada developed an approach to rapidly identify bacteria that is responsible for as many as 400,000 cases of food poisoning in Canada every year. The technology makes it possible to genetically fingerprint *Campylobacter jejuni* in hours rather than days, allowing front-line inspectors to pinpoint where specific strains originate which helps minimize transmission.

Another GRDI project, led by AAFC, developed a test to quickly detect a damaging parasite found in soybeans. The innovation has helped Canada to guarantee that its shipments are free of disease, which ensured continued access to a $50-million market in Malaysia.

Archibald said Canada has two more interdepartmental genomics projects launching in 2016-2017: an anti-microbial resistance project focusing on food production, and an eco-biometrics project that will develop tools to study freshwater biodiversity, monitor drinking water, and evaluate soil health for the agricultural and forestry industry.

"It's our collaborations that put us in a strong position for this response and for future responses," said Archibald. "The impact of science and technology on our citizens, economy and society over the two decades is going to be profound."

Relevant Documents:

Report of the Expert Advisory Group on Government S&T,

Summary of Recommendations
Report of the Expert Advisory Group on Government S&T

1. Leadership: Establish a new department — Science Canada —led by a Minister of S&T responsible for the intramural R&D needs as well as for the government's support of the academic research community.
2. Create a Federal S&T Governance Board to provide leadership and coherence to federal support of the national science and innovation ecosystem. It should have subcommittees and prioritize and direct federal S&T activities.
3. Expand the *One HR for Government Science* initiative to all SBDAs, modernize S&T occupational classification system and develop new mechanisms for inter-departmental and inter-sectoral mobility.
4. Modernize and optimize federal S&T physical infrastructure to seize new opportunities and address emerging challenges. This includes developing an evergreen S&T infrastructure strategy and roadmap to guide investment decisions.
5. Embrace open innovation and deploy new digital technologies to deliver government S&T in more effective ways and work with Shared Services Canada to develop common computational platforms.
6. Launch Federated Anticipatory, Adaptive, Advanced S&T Networks (FA3STnets) to rapidly mobilize national S&T capacity for urgent, horizontal, public policy priorities and grand challenges.
7. Build a set of federal Centres of S&T Expertise to perform S&T foresight, intellectual property management, strategic S&T policy, knowledge mobilization, science culture promotion and S&T risk management. Centres would be attached to ScienceCan, consolidating internal capacity and linking to relevant external capacity.