

Brief to the Federal Finance Committee

CANADIAN NETWORK OF SCIENTIFIC PLATFORMS (CNSP) RÉSEAU
CANADIEN DES PLATEFORMES SCIENTIFIQUES (RCPS)

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Executive Summary:

The Canadian Network of Scientific Platforms (CNSP) is writing to the finance committee to express our support for the recommendations of Canada's Fundamental Science Review Panel. Specifically, we support the recommendation for increased funding to the tri-agency granting councils, stable funding for the Canada Foundation for Innovation (CFI) and increased funding for university Research Support Funds.

Technology development is at a rapid pace and individual research labs cannot afford to have all the required research infrastructure within their own laboratory. In addition, to address fundamental research questions many diverse tools and technologies are required but it would be difficult for each research laboratory to have the diverse expertise required to excel in multiple technology areas. Scientific platforms (SPs) have emerged to maintain **state-of-the-art infrastructure** and provide **highly specialized expertise** to use the infrastructure to its full potential. This allows researchers at a given institution to have access to an array of technologies and expertise to generate the high quality, quantitative and reproducible data required to address fundamental research questions and stay globally competitive.

The Canadian government has invested billions of dollars in research infrastructure over the last decade. For example, as of 2016, the CFI has supported 9,303 projects at 145 research institutions with \$6.7 billion in investment [1]. Additional funding to SPs will lead to a good return on this tremendous investment. Funding just one full time job in a SP leads to support for millions of dollars of infrastructure investment and training and education for hundreds of researchers. Increased funding for tri-agency operating grants and stable funding for the CFI will ensure researchers have access to SPs, SPs will be able to maintain and renew cutting-edge technologies, enable research and development (R&D) and provide new sustainable jobs. SPs train and educate hundreds of young researchers feeding into the knowledge economy. SPs make it easier for young scientists to hit the ground running and generate high quality reproducible data while setting up new laboratories. Funding for university research support funds will allow institutions to invest in centralizing SP finance and administration freeing up SP scientists to focus on training and education of the next generation, R&D and providing support for research labs to generate rapid reliable research results. High quality SPs can be used by institutions as a recruitment tool and to initiate and sustain R&D relationships with businesses.

Funding for SPs through these three panel recommendations is aligned with several government priorities. Well managed strong SPs will ensure high risk high gain research can produce accurate results rapidly keeping Canadian science competitive on the world stage. Almost half of all SPs jobs are held by women (47%) supporting equity initiatives. SPs are training the next generation of scientists for high quality jobs. SPs are a key player in building corporate-academic R&D partnerships. Finally, research results from SPs will lead to new discoveries and new inventions that will improve the quality of life and health of Canadians.

HELP CANADIANS BE MORE PRODUCTIVE

1. High quality stable technology jobs.
2. Advancement of science.
3. Access to world class expertise and infrastructure.
4. Institutions can recruit and retain top scientists.
5. Institutions can partner with business for R&D.
6. Maintain top international relationships.
7. New technologies and new discoveries.
8. Improve quality of life and health of Canadians.

Abbreviations: CFI-Canada Foundation for Innovation; CNSP-Canadian Network of Scientific Platforms; SPs-Scientific Platforms, R&D-Research and Development

The Canadian Network of Scientific Platforms (CNSP) (www.cnsp-rcps.ca):



The CNSP is a network of scientists and administrators responsible for the maximal effective use and sustainability of scientific infrastructure platforms across Canada. Scientific platforms (SPs) span all research fields and are quickly becoming essential for the effective operation of state-of-the-art infrastructure and services. Highly effective SPs not only require state-of-the-art infrastructure and services but also highly qualified personnel (HQP) to operate the infrastructure and/or provide the services, support and educate researchers and lead research and development (R&D) in the field. The CNSP was created in August of 2016 and currently has **17-member institutions** from 8 provinces representing **140 scientific platforms**. The SPs within the CNSP serve approximately **10,000 researchers** from about **4000 research laboratories**. On average, each SP consists of ~\$6M worth of infrastructure investment by the Canadian Foundation for Innovation, federal and provincial funding agencies, institutions and industry. This tremendous investment of scientific research funding totaling **half a billion dollars** (within the CNSP network facilities) requires stable long-term funding for infrastructure renewal, operation and maintenance and salaries of HQP. SP support will keep Canadian research programs at the forefront globally. These long-term investments will ensure an exceptional return on the immense infrastructure investments made by the Canadian people.

Canada's Fundamental Science Review:

In 2016, science minister Kirsty Duncan, appointed a 9-member panel of expert scientists and administrators to review how fundamental science in Canada is funded and to make recommendations on how the federal government could maximize investments to ensure Canada would be a global leader in scientific research. The panel was led by former University of Toronto president David Naylor. Round-table discussions were held across Canada with scientists, 1,275 written submissions from the scientific community were reviewed and made 35 recommendations were made in the Naylor report. The CNSP supports the recommendations of the panel and we would like to voice our support more specifically for three areas of the funding recommendations.

1. **The CNSP supports an annual increase of \$485 million to tri-agency research operating grant funds.** The tri-agencies fund research in Canada in the social sciences, natural sciences, engineering and health sciences. Approximately 50% of the operational funding in SPs comes tri-agency grants through user fees that researchers pay for access to infrastructure and training. Thus, an increase in funding to the tri-agency grant programs will lead to many benefits for SPs.
 - a. Researchers will have consistent access to the technologies and expertise required to **address fundamental research questions**.
 - b. Creation of **new jobs** and sustainability of existing high quality technical jobs. University trainees work for 2-5 years so it is critical to have stable jobs and expertise in SPs for the long-term retention of knowledge.
 - c. Support R&D activities for the **rapid development and implementation of novel technologies**.
 - d. Support the development and implement of **custom technology workshops and courses** to train the next generation of scientists.
 - e. **Support women in science.** Women represented 59% of all university graduates in Canada aged 25-34 in 2011 [2]. However, only 39% of STEM graduates are women. In fact, women accounted for less than a third (28%) of those employed in scientific research and development (R&D) across the world in 2013 [3]. Based on CIHR grant applications 32% of principle investigators in the health sciences are women [4] and 30% of Canada Research Chair holders are women [5]. Importantly, based on a CNSP demographic survey conducted in 2017 **women hold 47% of all SP jobs** [6]. Women hold leadership roles as SP directors (44%) and managers (53%). Any investment in SPs will fund **high level scientific positions for women in science**.

Abbreviations: CFI-Canada Foundation for Innovation; CNSP-Canadian Network of Scientific Platforms; SPs-Scientific Platforms, R&D-Research and Development

2. **The CNSP supports ongoing predictable and stable funding for the Canada Foundation for Innovation (CFI) at the levels recommended in the Naylor report (\$535 million/year):** Stable funding for the CFI will ensure SPs continue to have opportunities to be involved in outstanding scientific proposals to access new state-of-the-art infrastructure and stay competitive. Stable CFI funding will have many benefits including the following.
- Operation and maintenance funding will ensure **infrastructure is in top condition** and available to the larger research community for the **rapid generation of high quality research results**.
 - Operational funds will ensure **stable jobs for highly trained scientific staff** to allow researchers to access the expertise they need to address research questions and stay competitive.
 - Annual funding opportunities will allow institutions to **strategically plan for infrastructure renewal**.
 - Young scientists** can rapidly embark on their independent researcher careers. **Immediate access** to infrastructure and expertise in SPs will allow research projects to begin immediately while new researchers are setting up their research laboratories.
 - Researchers can **place their CFI funded equipment in SPs**. The SP can focus on infrastructure maintenance, protocol development, training and education. Researchers can focus on rapid set up of their world class laboratory and address their research questions. Any time the researcher does not need to use the equipment it can be used by the broader research community **maximizing returns on the investment**.
3. **The CNSP supports an increase in university research support funds to 40% of operating grant funding.** Canadian universities conduct \$13 billion in R&D annually [7]. SPs play a central role in R&D activities across all fields. New RSF funding could be used to support SPs centrally saving overall costs with the economy of scale and providing a single point of contact to make researchers aware of institutional infrastructure and expertise. Institutions could capitalize on new RSF funding to centralized finance, administration and management of SPs. This would create **new jobs** at the institutions to link businesses with SPs so they could have access to state-of-the-art infrastructure and be involved with R&D activities in SPs. Centralized university support would support the following.
- Free up scientific staff to focus on **infrastructure maintenance and quality control, R&D, educational courses and workshops**.
 - SP staff will have more time to train hundreds of young researchers in highly specialized areas **growing Canada's knowledge economy**.
 - State-of-the-art SPs are an excellent recruitment tool to **attract the best and the brightest minds** to Canadian institutions.
 - Canadian universities conduct one billion dollars of research for businesses [7]. Of the SPs surveyed, **45% currently have business users** [8]. Access to state-of-the-art infrastructure and expertise ensures small biotech companies, pharma companies and large Canadian companies can stay at the cutting edge. These companies cannot afford the infrastructure or the cost to develop the unique and extensive expertise required to operate it. However, these companies can afford to budget for usage fees. These fees can be set at market prices and can cover some of the operational costs of the SPs making it a win-win relationship. For example, corporate users account for 9% of SP usage but on average generate 17% of SP revenue (up to 80% of the revenue in some SPs) [8].

HELP CANADIAN BUSINESSES

1. Topmost contract research with academics.
2. Access to state-of-the-art infrastructure and expertise out of reach for the business to develop independently
3. Rapid high-quality discovery for businesses.
4. Keeping Canadian businesses competitive on a global scale.
5. Economic, social and health benefits for Canadians.

Abbreviations: CFI-Canada Foundation for Innovation; CNSP-Canadian Network of Scientific Platforms; SPs-Scientific Platforms, R&D-Research and Development

References

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- [4] CIHR 2016 Project grant results. <http://www.cihr-irsc.gc.ca/e/49852.html>
- [5] Canada Research Chair Program statistics.
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- [6] CNSP Demographic Survey 2017. https://www.surveymonkey.com/r/CNSP_demographics
- [7] Statistics Canada, Gross Domestic Expenditures on R&D in Canada, 2016.
- [8] CNSP Survey 2016. <https://www.surveymonkey.com/r/CNSP-RCPS>

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