

Canadian Science Policy Conference Session Report

*The Impact of Major Research Facilities as National
Assets: Responding to the Report of the Advisory Panel
on the Federal Research Support System*

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The Impact of Major Research Facilities as National Assets: Responding to the Report of the Advisory Panel on the Federal Research Support System

The 2023 Canadian Science Policy Conference session on Major Research Facilities (MRFs) brought together policy experts, science administrators, researchers and other stakeholders to discuss the recommendations of the *Report of the Advisory Panel on the Federal Research Support System* concerning MRFs. The Advisory Panel proposed a new paradigm, in which the government funds MRFs as a portfolio, and adopts a lifecycle approach from planning to decommissioning. Panelists highlighted the role of MRFs in tackling emerging research challenges and opportunities. Participants and the panelists discussed how a new framework will address issues such as MRF sustainability, optimizing benefits to Canada, and what more needs to be done.

Organized by: Neutrons Canada

Panelists:

- Dr. Art McDonald, Gray Chair Emeritus in Particle Astrophysics and Nobel Laureate (Physics 2015), Queen's University
- Dr. Baljit Singh, Vice-President Research, University of Saskatchewan
- Dr. Marcella Berg, Assistant Professor (Physics), University of Regina
- Janet E. Halliwell, Principal, J.E. Halliwell Associates, Inc.

Moderator: Kevin Fitzgibbons, Board Director, Neutrons Canada

Attendance:

- Participants packed out the Governor General Room I.
- Leaders of MRFs and other facilities funded by the CFI Major Science Initiatives Fund representing physical, environmental, life, and social sciences and engineering were present, including from the following facilities: TRIUMF, Ocean Networks Canada, Canadian Light Source, CMC Microsystems, SNOLAB, Canadian Research Data Centre Network, Canada's Genomics Enterprise, and GlycoNet Integrated Services. Many of these contributed to the discussion.
- Neutrons Canada participated as an organizer and a new organization seeking to secure access to MRF-scale infrastructure for Canadian researchers who require neutron beams.
- Other participants were from third-party research organizations (e.g. Brain Canada), national labs (e.g. Canadian Nuclear Laboratories, National Research Council, Labs Canada), and funding agencies (e.g. Canada Foundation for Innovation). Some of these participated in the discussion.
- University researchers were present, including two Early Career Researchers (Alannah Hallas, UBC; and Marcella Berg, University of Regina) who testified of the critical importance of facilities such as TRIUMF, CLS and neutron sources to their research, and the need to travel outside Canada to access neutron sources.



Points of agreement

- The value of MRFs as essential components of the research ecosystem was universally recognized.
 - They are unique, national in scope, and enhance Canada’s scientific reputation internationally as a player in science, helping to attract talent to Canada.
 - They help Canada collaborate internationally on solving global challenges.
 - They catalyze research teams, bringing researchers together to work on complex problems.
 - They contribute economically to Canada in various ways by answering research questions for industry, training HQP for high-tech careers in industry careers, spinning off technologies, or attracting foreign investment in major experiments.
 - They play a critical role in inspiring young people to think big and pursue S&T careers.
 - The conception of a ‘research infrastructure’ must include the human resources required to operate and derive value from the infrastructure.
- MRFs are used by researchers in all disciplines including the social sciences, and many are multidisciplinary.
- The recommendations of the *Report of the Advisory Panel on the Federal Research Support System* concerning Major Research Facilities (MRFs) should be implemented as soon as possible. Implementation is urgent and should not wait until a perfect solution is found.
 - Urgency is driven by the potential loss of our leading capabilities, including highly qualified personnel and technological leadership, to other countries that have already put frameworks in place that are now enabling them to continuously develop and improve their facilities over the long term. We need long-term planning to remain world-class.
 - In the case of neutron sources, we are losing people who use neutron scattering, because this infrastructure is missing from the landscape. The framework is urgent to keep the community together.
- **Implementation of the recommended funding framework, even without a commitment of new funds, would be welcomed by all the facilities, because it would be a major improvement to the way that Canada makes decisions about funding these facilities and the associated Major Science Initiatives. Once the framework is in place, it will be easier to have an ongoing conversation about the appropriate level of funding.**
- The issues affecting MRFs also affect smaller facilities that are MSI-funded, and rolling out the MRF framework now will have trickle-down effects on improving the governance and funding framework for these facilities as well, both immediately and over time as MRF/MSI policy evolves.
 - For example, a taxonomy is needed to determine distinctions between MRFs, MSIs and other like facilities and organizations, and this taxonomy will be developed over time as Canada gains experience with an MRF framework.
 - The MSI Fund can co-exist with the MRF framework as the two programs will deal with different scales of facilities.
- The total funding available for existing MRFs (and MSIs) is insufficient and is best worked out overall within a framework that enables their consideration as a portfolio as well as their value.

- Funding ‘asks’ for individual MRFs directly to the center of government are necessary in the meantime until the MRF framework is put in place, after which the funding should be rolled into the MRF framework.
- Funding models need to recognize the critical importance of scientific, technical and professional staff at the MRFs in supporting their research users and continuously developing the facilities to maintain them at the state-of-the-art. Funding for such research and development also enhances the attractiveness of such career paths.

Participants acknowledged that the need for an MRF framework has been a persistent policy issue since the early 2000s. Multiple panels and reports have identified the need and recommended similar solutions as the recent Advisory Panel on the Federal Research Support System.

Implications and observations

- These changes will require CFI to move away from being a project funder to being a steward of the infrastructure, promoting accountability and funding operations.
- Many of the issues affecting MRFs bear resemblance to issues faced by third-party research organizations (e.g., Brain Canada, Genome Canada), and by Government-owned and operated research infrastructure (e.g., those being planned and constructed by Labs Canada) such as the need for lifecycle funding. The Strategic Science Fund, as an attempt to consider all third-party research organizations as a portfolio, bears some resemblance to an MRF portfolio. These sectors of the research ecosystem may benefit from more collaborative exchange of ideas and policy development.
- There is a need for more money in the system; a policy that calls for automatic annual budget increases in funding for science could be part of the solution.

Summary of Essential Components of the Framework Discussed and Agreed at the MRF Panel Session

Federal responsibility and oversight – Governments must acknowledge that MRFs are national assets representing large public investments and that they warrant greater federal responsibility and oversight of their funding and governance.

- Canada needs a policy commitment to maintain MRFs at a world-class level in comparison to international benchmarks.
- Government acknowledgement of MRFs as national assets does not mean that MRFs must be ‘nationalized’ with government ownership and operations but government oversight and responsibility for maximizing the scientific and technological return on the major investments made in these national assets must be increased.

Lifecycle (sunrise to sunset) planning – MRFs require the funding model to move away from a project-based approach toward a long-term focus.

- Planning also includes direct and long-term engagement of provinces and other stakeholders in the framework.
- The long-term, rather than project-based, focus will better allow agility to fund infrastructure in a way that effectively deals with uncertainty and changes over time.
- The scope of the planning should consider the associated research programs that require the MRF, funding them at a level to enable Canadian researchers to lead the sciences that require the MRF, thus providing a full return from these assets.

Roadmapping – Roadmapping processes that define the research infrastructure landscape and identify future needs for MRFs have been demonstrated in Europe and Australia as very useful for informing funding decisions. Roadmapping can also help determine when to wind down facilities as well as create new ones. A similar process in Canada is needed.

Portfolio – A government agency, such as the Canada Foundation for Innovation (CFI), must be mandated to oversee and administer funding of all MRFs.

- A portfolio approach will enable choosing what to fund with consideration of the whole ecosystem and ensure that the solution is adaptable to facilities of different sizes and different disciplinary needs.
- The portfolio should also include Canadian access to, and participation in, international MRFs either situated in Canada or other countries. Thus, a centralized body is needed that can act as the point of contact for agreements with foreign countries on MRFs.
- A funded mandate is needed for any agency to take on this role, as there will be large substantial administrative responsibilities to oversee the MRF portfolio.
- Final decisions on funding above a certain threshold should be made by Cabinet on the advice of the responsible government agency, whose advice in turn is made on the advice of the MRF scientific advisory body (described below).

MRF Scientific Advisory Body – The agency overseeing the MRF portfolio will require a body of experts to advise on the portfolio of investments, including the following:

- Overseeing the roadmapping process.
- Reviewing, or advising on scientific review processes for, MRFs at all stages of their lifecycle, including proposals for seed money for the development of new MRFs to capital construction and operations, to decisions to terminate MRFs at the end of their lifecycle.

Smaller facilities: Issues affecting MRFs also affect smaller facilities. The MRF framework will have trickle-down effects on improving the governance and funding for these facilities as well.

Acknowledgments

Report Author

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Contributors

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Session Organizer

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