National Research Council Canada

2018–19

Departmental Plan

Supplementary Corporate Information

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Raison d’être

As the largest federal performer of research and technology development in Canada, NRC advances scientific knowledge, supports business innovation and provides technological solutions to pressing public policy challenges. Working with industry, government and academia, NRC’s scientific experts and industrial technology advisors support a broad range of science and innovation activities, including helping technology-based small and medium-sized enterprises to scale-up, access global value chains and become internationally competitive. By balancing the advancement of emerging science and technology required for tomorrow’s economy with innovation support that Canadian companies need to grow and succeed, NRC translates scientific excellence into innovations that improve the quality of life for Canadians and people around the world. By combining its strong national foundation and regionally-based network of specialized scientific infrastructure[i] with deep international partnerships, NRC has become an enabling platform for connecting diverse expertise across Canada’s innovation system, focusing these efforts on the most valuable goals for the country.

Mandate and role

Under the National Research Council Act[ii], NRC is responsible for:

- Undertaking, assisting or promoting scientific and industrial research in fields of importance to Canada;
- Providing vital scientific and technological services to the research and industrial communities;
- Investigating standards and methods of measurement;
- Working on the standardization and certification of scientific and technical apparatus, instruments and materials used or usable by Canadian industry;
- Operating and administering any astronomical observatories established or maintained by the Government of Canada;
- Establishing, operating and maintaining a national science library; and

- Publishing and selling or otherwise distributing such scientific and technical information as the Council deems necessary.

For more general information about NRC, see the "Supplementary information" section of this report. For more information on the department's organizational mandate letter commitments, see the Ministers' mandate letters on the Prime Minister of Canada's website.[iii]

Operating context: conditions affecting our work

Continuing uncertainties in the geopolitical environment, policies and priorities of international partners could impact the R&D efforts of NRC clients and partners in 2018-19. A survey of the world's top 1000 R&D spenders identified the disruption of their global R&D networks as an anticipated impact of economic nationalism. Canada, nevertheless, is identified as potentially benefitting should this direction become a longer-term reality[1]. Growth of 2.0% is forecasted for the Canadian economy in 2018 (after 3.1% in 2017), and Canada is expected be a leader amongst the G7 countries to drive global growth of 3.1% in 2018 (up from 2016) [2]. Higher commodity prices, and the low Canadian dollar are some other factors driving real GDP outlooks for many Canadian industries in the near-term.

As for Science in Canada, the recent results of the federally commissioned panel on fundamental science identified 35 recommendations that serve as input into a new vision developed for Canadian R&D including: establishment of a Canada Research Coordinating Committee to improve collaboration between players; consideration of a network of departmental chief science officers; new investments in research and infrastructure; and supports for learning and careers in STEM. Such directions are anticipated to enable more focused efforts and effectiveness amongst stakeholders working within the Canadian science, technology and innovation ecosystem on publicly-funded research initiatives

Federal priorities and strategies in the areas of: advanced manufacturing, agri-food, clean technology, digital industries, health/bio-sciences and clean resources will guide NRC research directions, with opportunities for partnership in supporting federal investments in other priority areas including transportation, smart cities amongst others. As business-led innovation Superclusters gain momentum in 2018-19, NRC will continue its engagement with cluster lead organizations to support accelerated economic growth in areas of greatest potential. Developments in government digital services, and results from the review of Canada's Intellectual Property Strategy will also affect NRC relative to its operations.

[1] PwC: The 20176 Global Innovation 1000 Study. 2017: https://www.strategy-business.com/feature/Will-Stronger-Borders-Weaken-Innovation?gko=848b0

[2] Conference Board of Canada: Canadian Outlook Economic Forecast, Autumn 2017.

Key risks: things that could affect our ability to achieve our plans and results

Building on the operational context identified above, some key factors in the environment driving risks for NRC in the coming year include:

- **Emerging ("exponential") technologies reliant on information technologies:** Major, cross-cutting technologies that are key to advancing breakthroughs are dependent on increasingly sophisticated computing capabilities in information technology. Such technologies include: big data, artificial intelligence and analytics; cybersecurity and privacy technology; genetic technologies; internet of things; quantum computing; robotics and autonomous vehicles. NRC is currently putting significant attention towards enabling its IT infrastructure and high-performance computing capabilities, with consideration of options for the most effective operating model. Some progress has been made, with significant work taking place during 2018-19 and beyond.
- **Increase partnerships at domestic and international levels for NRC to advance priorities:** This creates potential uncertainties in alignment of stakeholder interests, infrastructure to enable collaboration, managing interdependencies, and client expectations. NRC will establish collaboration centres as part of its Dialogue Action Plan to facilitate greater engagement and optimizing use of infrastructure.
- **Managing resources and activities targeted to different stakeholders:** NRC will need to manage its resources effectively to enable the desired balance between advancing scientific knowledge, supporting business innovation, and delivering policy solutions for government. An NRC Strategic Plan will guide decisions at a high level including decisions on NRC's Investment Framework for R&D activities.
- **Increasing competition for scientific and technical talent and funding:** Highly-skilled R&D talent are not bound by geographic boundaries, and there is increasing competition from around the world for very specialized expertise that could be sourced potentially from other organizations (as a service, or recruited). NRC will develop HR strategies in 2018-19 to ensure that it can recruit and retain existing talent to meet current and anticipated future capability requirements
- **Implementing the results from the NRC Dialogue** arising from the internal NRC engagement process will take place while maintaining business operations. To ensure that the changes are well-managed, NRC established a dedicated implementation hub to manage the overall project and the interdependencies of the various initiatives, supported by external expertise and an internal Change Management Advisory Board representing a broad cross-section of NRC management and functions

Risks	Risk response strategy	Link to mandate letter commitments or to government-wide and departmental priorities [3]
Human Resources - Talent: NRC will not be able to attract, retain and align best talent with organizational priorities leading to inefficiencies, lack of ability to deliver and lack of credibility.	• Enhance number of student and post-doctoral placements; • Lead a multi-stakeholder working group to identify needs and potential tools to record and track expertise; • Develop and leverage mobility mechanisms such as assignments and industrial placements; • Develop a strategic plan to identify and address the key challenges and opportunities for talent attraction and retention. **Measures:** Regrettable departure rates, post-doctoral fellowship retention rates, representation of women in STEM-related roles and in management, cross-program collaboration.	Enabling Canada's Innovation and Skills Plan Science and Research Excellence Managing Resources Effectively
Operational Funds - Infrastructure: Aging research infrastructure will not be renewed leading to difficult choices between programs, an inability to deliver innovative S&T and retain top talent, and diversion of operating funds.	• Conduct 3-year review of NRC facilities, including developing an inventory of NRC facilities to be reviewed, conducting internal assessments, and launching external reviews; • Align facility and infrastructure investments with strategic directions, in consideration of findings from above, and ongoing operational requirements; • Explore alternative models to recapitalize major science assets (e.g., competitive funding, public-private partnerships) **Measures:** Age of a facility as a proportion of expected useful life; % of capital costs invested in maintaining assets/recapitalization; facility repair expenses (corrective maintenance) as an indicator of issues; internal NRC client satisfaction	As above
Information Technology - Security: Failure of IT security systems may lead to unauthorized access to sensitive / confidential data, compromised results, and loss of credibility.	• Encapsulation of the legacy network to improve security posture; • Continuation of the Security Awareness and Education Program; • On-going Security Assessment and Authorization process in place for all services and systems prior to being brought on-line; • IT Security Operations (Regular vulnerability scans, personnel screening, least privilege security model). **Measures**: Number of IT Security Incidents, Number of	As above

[3] Aligning to government-wide priorities (budget themes) and departmental priorities. Internally, all Risks link to NRC's Core Responsibility of Science and Innovation.

	participants in Security and Awareness training sessions, Vulnerability Assessment results, Results of mock phishing campaigns, Number of systems with full (vs. conditional) Authority to Operate	

Endnotes

i NRC research facilities, www.nrc-cnrc.gc.ca/eng/solutions/facilities/index.html

ii National Research Council Act, http://www.laws.justice.gc.ca/eng/acts/N-15/

iii. Mandate letters to the Ministers, http://pm.gc.ca/eng/mandate-letters