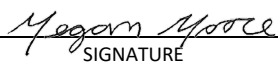






Title: CNLs' Canadian Nuclear Research Initiative (CNRI) for Advanced Reactor Development: 2020 Program Guidelines		Date: 2020/10/23	
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**1. CNL’S CANADIAN NUCLEAR RESEARCH INITIATIVE FOR ADVANCED REACTOR DEVELOPMENT PROGRAM OVERVIEW**

Canadian Nuclear Laboratories’ (CNL) Canadian Nuclear Research Initiative (CNRI) is a program to support collaborative Advanced Reactor (AR) research projects with third-party proponents in Canada. The goal of the program is to accelerate the deployment of safe, secure, clean, and cost effective ARs in Canada.

Annually, CNRI will issue a call for proposals (CFP), and CNL will enter into joint R&D projects based on the results of a review of these proposals. The objective of CNRI is to make CNL’s technical capabilities and expert knowledge available and accessible to the AR community in order to equip them with the technical support required to progress towards AR deployment in Canada.

The benefits of these joint R&D projects will be shared between CNL and the applicant. Work will begin as early as April 2021 and can continue until March 2023.

**1.1 Focus Areas**

A CFP will be issued annually as part of the CNRI program. The 2020/21 CNRI CFP emphasizes low technology readiness level work to support technology development in order to accelerate future deployment of advanced reactors. The focus areas for the 2020/21 CNRI CFP are listed in Table 1.

**Table 1: CNRI 2020/21 Call For Proposals Focus Areas**

	<b>Topic</b>	<b>Focus Areas within Topic</b>
1	Advanced Nuclear Systems (including SMRs)	<ul style="list-style-type: none"> <li>• Vibration and Wear</li> <li>• Materials research (modelling and experimental)</li> <li>• Fuel research (modelling and experimental)</li> <li>• Thermo-hydraulic research (modelling and experimental)</li> <li>• Severe accident analysis</li> <li>• Cyber Security</li> <li>• Non-proliferation</li> </ul>
2	Fusion	<ul style="list-style-type: none"> <li>• Tritium Management</li> <li>• Thermo-hydraulic research (modelling and experimental)</li> <li>• Materials research (modelling and experimental)</li> </ul>
3	Nuclear Clean Energy System	<ul style="list-style-type: none"> <li>• Materials research (modelling and experimental)</li> <li>• Thermo-hydraulic research (modelling and experimental)</li> <li>• Safety/Security analysis of integrated systems</li> <li>• Energy Storage (modelling and experimental)</li> </ul>

**1.2 Potential Award Details**

Annually, CNL will enter into a series of jointly funded R&D projects that will utilize S&T services from CNL to accelerate advanced reactor technology development and support future deployments. Projects must be within the CNRI program focus areas, and are expected to be carried out by CNL staff. Subcontracts with other performing organizations may be included in the scope, but will not be eligible for fund sharing and will only be included at CNL’s discretion. Cost share ratios will be defined by CNL, with CNL contributing at most 50% of the commercial cost of the project. CNRI award is allocated on a project by project basis, and is not awarded

directly to the successful proponent. Any changes to agreed upon project scope after an agreement is finalized must be approved by both CNL and the proponents.

## 2. PROPOSAL REVIEW CRITERIA

### 2.1 Proposal Requirements

1. The CNRI program is intended to support joint research projects. CNL will contribute by providing access to CNL staff and facilities. CNL will not provide cash directly to applicants, or sub-contractors.
2. CNL will define a proponent contribution between 50% - 80% of the commercial value of the project based on the following factors: the value the research to CNL, the technology readiness level (favouring earlier TRL work) and whether the proponent has received previous CNRI awards.

Example CNRI Cost Share Calculation

$$\text{Proponent Cost Share (\%)} = \frac{\text{Proponents' Financial Contribution to CNL (\$)}}{\text{Total Cost of Work Completed using CNL Staff and Facilities(\$)}}$$

Note: In-kind contributions will not be considered as part of the cost share calculation, however they will be considered during final project selection.

3. For the 2020/21 CNRI call for proposals, projects must be complete by 2023 March 31. Projects that extend beyond 2023 March 31, will not be considered.
4. Work is to be performed at CNL by, or in cooperation with, CNL staff. Applicants may receive access to CNL facilities and/or laboratories when deemed necessary for the project.
5. Proposal must include at least one industry partner<sup>1</sup>.

### 2.2 Proposal Benefits

1. Proposals must align with at least one of the focus areas listed in the call for proposals.
  - a. Applications that include several focus areas in support of multiple objectives are welcome.
2. Proposal must create lasting value for CNL. This could be in the form of knowledge and/or technology development that CNL can leverage for future work.
3. Proposal must advance AR development/deployment.
4. Proposal must provide a benefit to Canada. This benefit does not need to be fully realized at the end of the project (ex. AR deployed in Canada). However, the proposal must clearly explain how the project supports a longer term goal for advanced reactors in Canada.
5. In-kind contributions must be clearly defined, identifying what is being offered and how it will benefit the project. An estimated dollar value must be provided.

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<sup>1</sup> An industry partner is defined a private sector entity directly involved with the commercialization of advanced reactors. This could include an advanced reactor designer/vendor, a future reactor operator and/or a member of the supply chain.

### **2.3 Project Scope**

1. Research goals of the applicant should be clearly defined with specific deliverables and target timeline.
2. The proposal must outline expected working arrangements between CNL and the applicant. For example, will CNL staff work in cooperation with applicants' staff? Will work be carried out at one of CNL's sites or somewhere else?
3. Project scope must be achievable within the project budget and available resources<sup>2</sup>.

## **3. CANADIAN NUCLEAR RESEARCH INITIATIVE AGREEMENT**

A CNRI agreement is a collaborative agreement that allows CNL and applicants to optimize their resources, share technical expertise in a protected environment, access intellectual property emerging from the effort, and advance the commercialization of developed technologies.

### **3.1 Finances**

Applicants must provide research funds as per the cost share requirement; but may also make in-kind contributions such as personnel, services, facilities, equipment, intellectual property or other resources.

CNL will manage the project and may provide personnel, services, facilities, equipment, intellectual property or other resources. CNL will contribute by providing access to CNL staff and facilities; CNL will not provide cash directly to applicants.

### **3.2 Terms and Conditions**

A standard set of terms and conditions has been established for the CNRI initiative. These terms and conditions can be found on the CNRI website ([www.cnl.ca/CNRI](http://www.cnl.ca/CNRI)).

### **3.3 Publications and Reports**

The applicants agree to produce the following deliverables, in conjunction with CNL, as part of the joint research project:

- An initial abstract suitable for public release;
- A final report, upon completion or termination of this agreement; contents to be agreed upon at the start of the project.

The parties agree to secure pre-publication review from each other wherein the non-publishing party shall provide written objections to be considered by the publishing party within 15 days of notice.

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<sup>2</sup> The initial project plan, including cost and resource requirements, will be set by CNL for proposals that have passed the technical review. The applicant will be given the opportunity to review the initial project plan prior to final selection.

**4. CNRI PROGRAM TIMELINE**

Date	Descriptions
16 November 2020	CNRI 2 <sup>nd</sup> call for proposals will be launched at G4SR-2 at which time we will begin accepting proposals.
4 January 2020	Deadline for proposal submission.
Spring 2021	Successful projects announced and work begins
September 2021	Next CNRI CFP is expected to be announced.

**5. CNRI APPLICATION GUIDELINES**

The total proposal is to be no more than eight pages in length. It should include the following five sections.

1. Abstract (200 words)
  - a. The abstract should be written in plain language, suitable for inclusion in a media release. It should include a description of the research project, target outcomes, and the benefit for CNL and Canada.
2. Alignment (up to 1 page)
  - a. Describe how the project aligns with one or more of the identified focus areas.
3. Impact (up to 1 page)
  - a. Define the key problem that is to be addressed through this project and its significance.
  - b. Describe how this project will support advanced reactor development/deployment in Canada.
4. Project Scope (up to 5 pages)
5. Define the research goals of the applicant, include specific deliverables and target timeline.
  - a. Identify the applicant project team, including names and expertise. Explain how the applicant project team will work with the CNL project team.
  - b. To the extent possible, identify the facilities, capabilities and expertise required to complete the scope of work.
6. Budget (up to 1 page)
  - a. Identify an approximate total budget for the project.
  - b. Identify monetary and in-kind contributions separately.
  - c. Note that in-kind contributions will not be considered as part of the matching calculation.

From the proposals that pass the technical review, CNL will select a set of proposals to proceed to negotiations. Through negotiations, CNL will work with proponents to draft a project plan in response to the CNRI proposal. This project plan will include scope, budget, cost share, and deliverables.