

POWER FORWARD CHALLENGE

Applicant's Guide



Department for
Business, Energy
& Industrial Strategy



Natural Resources
Canada

Ressources naturelles
Canada

Canada

INTRODUCTION

Natural Resources Canada (NRCan) and the UK Department for Business, Energy & Industrial Strategy (BEIS) developed this Challenge with the 2030 grid in mind. As electric vehicles (EVs), smart devices, storage systems, remote connectivity and the like become more commonplace, the demands placed on our electricity grids will become increasingly complex and very different from when they were built. Disruptive technologies and new thinking are necessary to develop, maintain and maximize the potential of clean, robust and flexible power grids and energy systems, and innovation is the key to understanding and enabling electrical grids, looking ahead to 2030 and beyond.

With this in mind, NRCan and BEIS are launching the Canada-UK Power Up Challenge (the Challenge). We are looking for innovators from Canada and the UK to come together to pitch high-quality projects that explore the cutting edge of smart grid innovation. Over the next decade, millions of new smart, connected, electric devices will come online at the “grid edge,” with the potential to act as new energy system assets. In anticipation of this, policymakers, systems operators and innovators in the electricity sector are reconsidering how to most effectively seize the clean growth and competitiveness opportunities linked to this trend. We are asking firms to come together to build out end-to-end solutions to aggregate and manage networks of distributed energy resources effectively to support their integration to the grid and the provision of clean, flexible, reliable electricity.

Solutions will need to be disruptive, modular and scalable, interoperable, and demonstrate clear value to the end user and the grid. Teams will have to be international and bring together aggregators of distributed energy resources, as well as a variety of innovative software and hardware solutions.

CHALLENGE OBJECTIVES

The objectives of the Challenge are:

- Demonstrate innovative technology solutions that can aggregate and manage increasingly large and complex groups of distributed energy resources to support grid flexibility, stability and reliability;
- Build on Canadian and United Kingdom (UK) strengths in smart grid technology and bring together innovators from both countries to design solutions for the grid of the future;
- Create concrete opportunities for Canadian firms looking to expand into UK (and European) markets and UK firms looking to expand into Canadian (and North American) markets;
- Support Canadian and UK leadership and competitiveness in clean technology innovation and the anticipated market opportunities for smart grid technologies in 2030 and beyond.

CHALLENGE OVERVIEW

Through an open call for proposals, a group of finalists will be selected to receive up to \$3 million or £1.8 million each over approximately 16 months to conduct a pilot-scale demonstration of their solutions for the grid of the future. Finalists will be chosen based on having assembled a consortium team that can offer the highest-impact, end-to-end solution that demonstrates the ability to integrate large and diverse groups of distributed energy resources to the grid while meeting a range of criteria outlined in Section 2 of this guide. Finalist projects will compete to demonstrate best-in-class performance and to be considered for the \$1 million prize awarded to the winning team (both UK and Canadian enterprises are eligible).

Prior to this demonstration phase, NRCan and BEIS will offer support to SMEs that wish to participate in the Challenge. This support will enable consortium-building activities and the development of feasibility studies for their proposed projects. In order to be considered for this support, SMEs will submit applications by 17 December 2018 outlining their project vision, and their plans to bring together a consortium and develop a full proposal for the Challenge. Selected proposals will be awarded CAN\$100,000 or £60,000. It is optional for teams to apply for this SME Participation support. Additional details on this process are outlined below.

Teams will have to decide whether their proposed project will be developed in Canada or in the UK. Based on this decision, there will be some instances in which different conditions apply. This guide clearly illustrates where different conditions apply.

TIMELINE

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| • Power Up Challenge launch | 16 October 2018 |
| • Call for proposals opens | 16 October 2018 |
| • SME financial support application deadline | 17 December 2018 |
| • Demonstration proposals deadline | 15 March 2019 |
| • Pitch event and announcement of finalists | by June 2019 |
| • Contribution agreements with finalists signed | by August 2019 |
| • Finalist demonstrations developed | by December 2020 |
| • Final event | by March 2021 |

Specific dates will be communicated through the Challenge website at <http://impact.canada.ca>.

GENERAL TERMS AND CONDITIONS

Applicants to the Challenge agree to the following when submitting their application:

- Applicants agree to comply with all applicable laws (in Canada and the UK).
- Applicants must be able to demonstrate ownership of or permission to use any intellectual property (IP) used in the Challenge.
- The Ministers of Natural Resources Canada and the Department for Business, Energy & Industrial Strategy have the sole discretion to cancel this Challenge or any part thereof at any time in their respective jurisdictions.

PRIVACY

All Challenge submissions will be reviewed by both NRCan and BEIS, irrespective of which country their proposed project takes place in.

NRCan

For NRCan, the use and distribution of data collected under this program will comply with both the [Privacy Act](#) and the [Access to Information Act](#). Pursuant to the *Privacy Act*, the program will keep confidential any personal information it may collect and will not disclose or transmit said information without the applicant's written consent.

Pursuant to the *Access to Information Act*, the program will protect from disclosure any information of a financial, commercial, scientific or technical nature it collects from applicants so long as the applicants treat said information as confidential in their own establishments. If the applicant chooses to send the proposal or other confidential information to Natural Resources Canada by email, NRCan will respond to the proposal by email. Similarly, if the applicant's correspondence is through regular mail, NRCan's response will be in like manner. However, in all cases, NRCan will use email correspondence to the applicants for all non-confidential matters.

Applicants to the Challenge have the option of allowing NRCan to share submitted information for the purposes of the Challenge with other organizations that provide funding and support for innovation, such as other Government of Canada departments and initiatives (e.g. the Government of Canada Clean Growth Hub); provincial, territorial or municipal governments; and not-for-profit organizations (e.g. Sustainable Development Technology Canada).

See Annex A for the letter of consent, which must be completed and submitted in order for information to be shared

BEIS

Privacy Statement

Who are we?

Department for Business, Energy & Industrial Strategy

<https://www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy>

The Department brings together responsibilities for business, industrial strategy, science, innovation, energy and climate change.

How will the information you provide if applying to this Challenge be used?

The information provided when applying to this Challenge will be used within the UK Department for Business, Energy & Industrial Strategy (BEIS), Ofgem and other central government bodies in the UK to determine funding decisions on collaborative innovation projects between Canada and the UK. BEIS will share the information from the proposals with our equivalent organisations within Canada, Natural Resources Canada (NRCan), Innovation, Science and Economic Development Canada (ISED), and Environment and Climate Change Canada (ECCC), which may in turn pass information on to other stakeholders that provide funding and support for innovation, such as other Government of Canada departments and initiatives (e.g. the Government of Canada Clean Growth Hub); provincial, territorial or municipal governments; and not-for-profit organizations (e.g. Sustainable Development Technology Canada).

Using your personal data

Personal information that you supply to us via the proposal will be used as documented immediately above. We will not disclose any information outside this remit unless required to do so by law.

See Annex A for the letter of consent, which must be completed and submitted in order for information to be shared and for applications to be assessed.

ELIGIBILITY

Eligible project leads may include the following:

- Legal entities duly incorporated and validly existing in Canada or the UK, including:
 - Small and medium-sized enterprises (as defined by the [EU](#) for UK projects and by [Canada](#) for Canadian projects);
 - Other for-profit and not-for-profit organizations such as companies, utilities, industry associations and research associations;
 - Indigenous organizations and groups; and
 - Canadian/UK post-secondary/academic institutions.

Note: Non-Canadian or non-UK individuals and entities may be part of a partnership or consortium submitting a proposal as long as the project lead meets the above criteria and is associated with at least one duly incorporated or registered legal entity in Canada or the UK.

Note: Project and partnership working requirements:

- Projects must take place in either Canada or the UK;
- **For UK-based projects**, a minimum of 20% of the total eligible cost for each project will need to cover work completed by organizations from Canada;
- **For Canada-based projects**, a minimum of 20% of the amount received from NRCan (up to CAN\$3M) must cover work completed by organizations from the UK;
- A maximum of 49% of the total project cost for each project can be incurred by organizations from the Challenge partner country;
- Companies from either country which establish a presence in the other country in order to lead a proposed project will be considered to be eligible to address the minimum partnership working threshold (20%), and will be exempt from the upper partnership threshold (49%).

Only the selected finalists' projects will be able to compete for the prize of \$1 million.

1. PHASE 1 – CONSORTIUM BUILDING & PROJECT PROPOSALS (OCTOBER 2018 – JUNE 2019)

The ultimate goal of Phase 1 will be for participating teams to submit fully formed proposals for pilot demonstration projects. If selected, teams will receive up to CAN\$3 million/£1.8 million to execute their demonstration project in Phase 2 of the Challenge. Phase 1 will run from the opening of the call for proposals on 16 October 2018 to the selection of finalist projects by June 2019. Throughout Phase 1, teams will focus on the formation of consortium teams and the development of their project proposals.

Phase 1 will be comprised of three main activities:

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| <p>Support for SME Participation (OPTIONAL) <i>Deadline for applications:</i> 17 December 2018</p> | <p>To support the participation of SMEs in the Challenge, NRCan and BEIS invite individual SMEs or groups of SMEs (with an identified lead) to apply for financial support of up to CAN\$100,000/£60,000 in their respective countries by submitting a preliminary proposal by 17 December 2018.</p> <p>Proposals will:</p> <ul style="list-style-type: none"> • Clearly outline the project idea, explaining how it will meet the Challenge evaluation criteria. • Clearly outline applicants' plans to build their consortium and fully develop their proposal by 15 March 2019. • Include any other supporting document such as letters of support, etc. <p>Only selected applicants will receive support, which can be used to advance the development of consortium teams and project proposals, including feasibility studies. Selections will be made based on the recommendations of NRCan's and BEIS's Technical Evaluation Committees, which will consider project eligibility, perceived innovativeness, and how well applicants have laid out their plans to build out their proposal. An application form containing further instructions will be made available on the Impact Canada website: http://impact.canada.ca.</p> <p>Note: For the Support for SME Participation funding, NRCan will fund Canadian SMEs and BEIS will fund UK SMEs regardless of the location of the proposed project.</p> <p>NRCan and BEIS will take separate approaches to funding at this stage:</p> <ul style="list-style-type: none"> • For BEIS: Successful applicants will receive up to £60,000. Please carefully review Annex B, C, D, and E for details on how successful applicants will receive support • For NRCan: Ten (10) successful recipients will each receive CAN\$100,000 and will then be subject to a grant agreement, whose terms and conditions will be negotiated between NRCan and the recipients |
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| <p><u>Pilot-Scale Demonstration Proposals</u> (MANDATORY) <i>Deadline for applications:</i> 15 March 2019</p> | <p>Teams will be required to submit full project proposals by 15 March 2019 in order to compete to be selected for Phase 2 of the Challenge. From these proposals, NRCan's and BEIS's Technical Evaluation Committees will evaluate and rank the proposals, selecting a group of semi-finalists. The semi-finalists will be invited to pitch their projects to a panel of expert judges at a Phase 1 pitch event in May 2019. Semi-finalists will receive a score from the panelists which will be considered for selecting the finalists who will proceed to Phase 2.</p> <p>Further application instructions, including descriptions of the evaluation criteria, will be made available on the Impact Canada website: http://impact.canada.ca.</p> <p>Note: Being selected for Support for SME Participation funding is not a pre-requisite for submitting a full application. Both proponents who do not apply for and who do not receive SME Participation financial support are still eligible to submit full proposals in March 2019.</p> <p>Note: NRCan and BEIS will conduct due diligence on all semi finalists. See Section 4.1 for additional information on NRCan's and BEIS's financial due diligence/validation processes.</p> <p>Note: NRCan will fund Phase 2 projects that will be based in Canada. BEIS will fund Phase 2 projects that will be based in the UK. NRCan and BEIS will collectively select the Phase 2 finalist projects.</p> |
| <p>Additional Support from NRCan/BEIS (OPTIONAL) <i>Details will be made available on the Impact Canada website</i></p> | <p>NRCan and BEIS will look to support engagement between Canadian and UK innovators, and the development of feasibility studies for the proposed projects through a series of activities during Phase 1.</p> <p>Additional information on these activities will be posted on the Impact Canada website in Fall 2018: http://impact.canada.ca.</p> |

1.1 Application Requirements for Phase 1 Pilot-Scale Demonstration Proposals

As mentioned above, the call for proposals for pilot scale demonstration proposals will open with the launch of the Challenge on 16 October 2018. The deadline for applications is 15 March 2019. Application documents will be available through the Impact Canada website: <http://impact.canada.ca>. Further challenge details, including application instructions and specific dates, will also be available on the same website.

In order to be considered, each applicant must provide the following by the closing date:

- supporting documentation for eligibility;
- supporting documentation for IP, if applicable;
- detailed proposal as described below (see Section 1.2);
- risk mitigation plan as described below (see Section 1.3);
- financial risk assessment as described below (see Section 1.4); and
- information on existing funding.

Each submission must provide sufficient details to enable assessment against the Evaluation Criteria (Section 2).

1.2 Detailed Proposal

Applicants must include a full description of how project objectives will be achieved and a clear description of all project activities and associated costs. Each applicant is expected to provide the following information in his or her proposal:

- the name(s) and contact information associated with the submission, with the project lead clearly identified;
- official proof of the project lead's legal structure and eligibility to receive funding from either BEIS or NRCan, and the prize;
- description of the partnership or consortium that will carry out the project;
- details about the business model and partnerships;
- a detailed analysis to support expected costs, using the Canada-UK Power Up Challenge Financial Form. The form will be made available on the Impact Canada website: <http://impact.canada.ca>. This form should be downloaded, completed and included in applicants' full submissions.
- a work plan, including timelines, activities and milestones for the full duration of the project if the project is selected as a finalist and funded;
 - **for projects in Canada:** each applicant may request up to four separate payments, which must be associated with clearly identified critical project milestones;
 - the value of the payments for each critical milestone must be justified by the proposed activities to achieve them, and supported by the details in the Financial Form;
 - **for projects in the UK:** applicants may request payments associated with clearly identified critical project milestones as well as reimbursement for eligible expenditures (see Annex E for UK eligible costs);
 - the value of the payments for each critical milestone must be justified by the proposed activities to achieve them, and the proposed project costs must be detailed in the Financial Form.
- a detailed description of specific tasks describing the work that will be completed to meet the project milestones (one paragraph per task) and a detailed breakdown of the activities required in order to complete the task;
- details about the technology to be demonstrated;
- details about how the technology will positively impact the grid of 2030 and produce environmental benefits;
- a detailed analysis to support expected direct and indirect GHG emissions reductions and energy savings;
- a detailed risk assessment (e.g. technology, business);
- the general approach used to execute the project tasks (e.g. in-house, contract, partners or vendor);
- plans for scale-up and project development beyond 2021; and
- criteria supporting any decision to stop and/or end the project before November 2020.

As part of the application process, all applicants are asked to submit a **public description of the project** (500 words). This should be a public facing form of words that adequately describes the project but that does not disclose any information that may impact on Intellectual Property (IP), is confidential or commercially sensitive. The titles of successful projects, names of organizations, amounts awarded and the description of the project may be published once the award is confirmed as final.

1.3 Risk Mitigation Plan

Applicants must provide a risk mitigation plan for the full duration of the project.

The plan must outline any project risks, including:

- the technical, regulatory, organizational and environmental risks associated with the project;
- approaches for overcoming or mitigating risk, including prior experience managing similar or comparable risks; and
- details on the regulatory framework that applies to the project, including a summary of the permits/approvals required for the project, a status update and timeline for obtaining them, and the impact any delays in obtaining them may have on the overall project.

1.4 Financial Risk Assessment

Applicants must provide certain documentation to support a financial risk assessment by NRCan and BEIS.

A financial risk assessment may be performed for each application that is selected as a semi finalist in May 2019. This assessment is intended to focus on the overall financial viability of the project, the applicant and potential partners during the Challenge. Please refer to Annex F for the requirements of the Financial Risk Assessment Report.

2. Evaluation Criteria

The Phase 2 finalists will be selected because they provide proposals that most clearly demonstrate the end-to-end capabilities of their projects to integrate increasingly large and complex numbers of distributed energy resources onto the grid, looking ahead to 2030. Finalists will also effectively project the positive impact of their projects on the environment, the grid and the cost to end users. Lastly, finalists will demonstrate a clear business case and a vision of how they will leverage the Challenge to support additional activities beyond 2021.

Projects that meet the application requirements will be evaluated against the criteria below. Consideration will also be given to factors that would help meet the overall Challenge objectives and increase their impact, such as regional diversity and representation.

Note: We strongly encourage applicants to structure part of their proposals around the criteria below (Sections 2.1 to 2.10), addressing as many of the questions as possible.

2.1 Feasibility

(During the evaluation, this section will account for 10% of the total score)

Describe the feasibility of the project to meet the objective.

- What are the risks associated with the project?
 - What mitigation strategies will be used to address the various risks identified?
- Does the project have the capacity and expertise to meet its objectives?
- Please elaborate on the expertise and roles of key team members.
- What are key milestones and deliverables, and when are they expected to be completed?

2.2 Consortium Building/Canada-UK Partnerships

(During the evaluation, this section will account for 15% of the total score)

Describe the consortium support for the project.

- Who are the partners and where are they located? How does the consortium meet the minimum 20% bilateral partnership threshold? (i.e. identify activities to be carried out by partners from the UK for Canada-based projects and vice versa)
- Do the partners or the consortium have the structure or capacity to support a successful project?
- Is the governance in place adequate for this type of project? Do the partners have a formal co-operation agreement in place?

- How will project activities be shared among partners or consortium members?
- How will any weaknesses in partnership or collaboration be addressed by 2021?
- What is the level of support from either a utility, distribution network operator or systems operator to the partners/ consortium? Is there an interconnection agreement in place?
- Does the partnership or consortium have the financial resources to achieve its objectives?
- Has any work already been carried out on the proposed project?

2.3 Technological Innovation

(During the evaluation, this section and section 2.3.2 will account for 25% of the total score)

2.3.1 Describe the technological innovations of the project.

- What is the nature of the technological advancement resulting from the project?
- What is the composition of the solution?
 - Size, number and diversity of controllable loads?
 - Presence and characteristics of generation and storage?
 - Nature of systems integration and control of the solution?
- How does the project demonstrate a clear understanding of directly competing technologies?
- Does the project demonstrate a progression in technology readiness level (TRL) and what is the current TRL? Please see Annex B for TRL descriptions.
- What is the Canadian content of the innovation?
- What is the UK content of the innovation?

2.3.2 Describe the end-to-end capacity of the project.

Proponents will fill out an “end-to-end test” for their proposed project, outlining its capacity to bring together hardware and software elements of a distributed energy resource integration solution in a way that addresses a range of criteria associated with providing flexibility services to the grid, improving situational awareness, unlocking new data-enabled value creation, and providing strong cyber security.

If proponents are not able to cover any of the criteria outlined in this section, ***it does not mean that their project is rendered ineligible***. This test is meant to establish a sense of the end to end capacity of each team’s solution. Proponents will provide detailed justification for how their project will function against each of the criteria they address, doing so for as many criteria as possible. Teams will be evaluated on the quality of their justification as well as the range of criteria that their solutions can address.

Flexibility Services

- Does the solution demonstrate the ability to effectively manage large, distributed and diverse sets of assets? This includes, but is not limited to:
 - Capability to control various loads and generation sources;
 - Capability to interact with multiple communication interfaces;
 - Compensating for variable renewable energy generation;
 - Droop control;
 - Volt-var optimization;
 - Co-ordinated frequency ride-through;
 - Arbitrage;
 - Dispatching reserve on an as-needed basis; and
 - Supporting internal system stability through local voltage control.
- Proponents should outline other flexibility services that their solutions provide with detailed explanations.

Situational Awareness

- Does the solution improve visibility and control of its assets and the network? This includes, but is not limited to parameters such as:
 - Real power;
 - Reactive power;
 - Voltage;
 - Frequency;
 - Greenhouse gas emissions;
 - Accuracy of algorithm generating load and/or generation forecasts; and
 - Generation and consumption prices.
- Proponents should outline other innovative situational awareness-related capabilities of their projects, providing detailed explanations.

Data-Enabled Value Creation

- Does the solution leverage or provide data from different streams to create new value for end-users, grid operators, distributed energy resource aggregators, regulators, or other stakeholders? Please consider examples such as:
 - Tools for customer intelligence;
 - Asset planning recommendations;
 - Outage/fault management recommendations; and
 - Safety considerations.
- Are the procedures in place to ensure high-quality data-sets and/or analytics?
- Will data—including information on contexts, acquisition details, uncertainties and analysis methods—be made available to the public for future study?
- Are new business models or efficiencies enabled?
- Is data being used to help advance the technical or scientific state-of-the-art?
- Is data being used to help reduce cost, improve system reliability or sustainability?
- How are public sensitivity, privacy, data ownership, permissions and safety issues addressed?
- Proponents should outline any other relevant information on how their solution is creating new value from data, providing detailed descriptions.

Cyber Security

- Does the solution have procedures in place to protect information technology systems, networks and critical infrastructure?
 - Does the solution meet, exceed or contribute to the development of industry best practices, standards, codes and regulations?

2.4 Interoperability

(During the evaluation, this section will account for 15% of the total score)

Describe how the project considers the development of greater interoperability.

- Is the solution portable?
- Does the solution consider software and hardware interfaces between devices, components and network endpoints, and are they clearly documented to allow for third party devices to expand on the solution's architecture?

- Are source codes and designs made available in the public domain to be used, examined, modified and redistributed for any purpose (i.e. open or free copyright licensing)?
- Is there a plan for the dissemination of the results and lessons learned from the project to experts and peers?
- Does the solution consider relevant standards and codes? Does the solution contribute to the development of new standards, codes, regulations or best practices?
- Does the solution employ an architectural pattern with functional modular units? Are they sufficiently documented to allow other service providers to interact with them?
- Proponents should outline other relevant information about how their solution is contributing towards greater interoperability, providing detailed descriptions.

2.5 Business Model

(During the evaluation, this section and section 2.6 will account for 20% of the total score)

Describe the project business model.

- How does the project demonstrate financial viability?
- Does the project meet required safety measures within the jurisdiction where it will take place?
- Is there a credible path and timeline to commercialization for the proposed solution? In which market(s)?
- What are the expected demands on Capital Expenditures (CAPEX) and Operating Expenditures (OPEX) related to future deployments and over the lifetime of the equipment? How sensitive are these to market conditions?
- How does the business model support the long-term (over three years) viability of the project?
- Is this solution or approach already commercially deployed elsewhere?
- Have you secured contracts for future commercial deployment of this solution?
- Have you or are you planning to bid for future commercial deployment of this solution?
- Do the project partners have clear and demonstrated market traction (e.g. existing and contracted revenues, commercial agreements in place, or investments from credible strategic investors)?

2.6 Business Innovation

Describe the innovative aspects of the project.

- Is the project scalable and replicable (not case-specific)?
- What financial innovations are proposed to advance and support the project?
- What kind of improvements are proposed to existing technologies?
- What is the potential for partnership(s) on this project to support the development of bilateral value chains between Canadian and UK entities?
- How does the project integrate with the existing infrastructure and the needs of end consumers, and what impact will the technology have on the marketplace?

2.7 Consumer Engagement Plan

(During the evaluation, this section will account for 15% of the total score)

Describe how the project engages consumers.

- What efforts have been made to understand the present level of satisfaction for end users of the proposed project?
- What are the projected benefits for consumers and how are the benefits distributed among them?
- What impact does the project have on consumers' energy consumption and/or participation on the grid?
- How does the project implementation plan ensure consumer views are incorporated into the design and delivery of the solution?
- Are there any additional tools or methodologies that the project is considering leveraging for consumer engagement?

2.8 Timelines

Describe the project timelines.

- Does the project have clear timelines and key milestones (i.e. a clear pathway to achieve the objective)?
- Will the project be completed by the end of March 2021?
- Are the project timelines feasible?

2.9 Economic Benefits

Describe how the project will generate economics benefits.

- How many direct and indirect jobs could the existing project and future scale-up create (overall and for local communities)?
- Does the project rely on any local or regional expertise?
- What are the benefits for Canadian and UK utilities, network and system operators?
- What are export opportunities for the technology?

2.10 Project Specifics

Describe the project.

- Where is the project located?
- What is the anticipated start and completion date?
- What activities will be completed for the project?
- How is the project novel and disruptive?
- What is the added value of public funding for this project and what would be the outcome if no public funding was provided?
- What is the estimated cost, total match funding and maximum total public funding requested?
- Will the acquisition of public funds allow the project to leverage private funds? Provide details on the nature of these funding relationships.

3. Assessment and Selection Process

- The Evaluation Criteria (Section 2) identifies the type of information required for assessment.
- A Technical Evaluation Committee made up of experts from Canada and the UK and representatives from within and outside of government will review and evaluate all of the applications. NRCan and BEIS will take appropriate measures to ensure that there will be no conflict of interest for any Evaluation Committee participants, and will exercise Non-Disclosure Agreements to protect proponents' information, where appropriate.
- The applicants who do not meet the eligibility criteria will be informed by the end of April 2019.
- The Technical Evaluation Committee will provide a list with the ranking of each project to NRCan and BEIS for final decision before the official release of the finalists' names.
- Unsuccessful applicants will have the opportunity to receive feedback on their results.
- NRCan and BEIS, at their own discretion, may decide to cancel the Challenge, following recommendation from the Technical Evaluation Committee, if significant concerns exist about the quality of the applications or the projects.
- The selected projects will be announced in May 2019. The specific date will be posted at <http://impact.canada.ca>.

4. PHASE 2 – EXECUTION OF DEMONSTRATION PROJECTS & SELECTION OF WINNER (AUGUST 2019 – MARCH 2021)

4.1 Terms of Funding for Phase 2 Projects

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| <p><u>Phase 2 Projects in Canada</u></p> <ul style="list-style-type: none">• NRCan will fund Phase 2 projects located in Canada.• NRCan will undertake financial assessment on• Projects will be eligible for up to CAN\$3 million through a contribution agreement to be negotiated between NRCan and the finalists with projects based in Canada.• Project proposals must identify a maximum of four clear and measurable milestones for payment between August 2019 and December 2020. Provision of financial support will be based on demonstrating the achievement of the milestones identified in the project proposal.• NRCan will work with the applicant to validate the proposal and project funding requirements.• Once the project has started, the achievement of the milestones will be validated/verified in order to release payment.• NRCan does not guarantee payment of the full or partial amount of the agreement. Payments can be delayed or withheld if the project does not meet the expected milestones identified in the proposal.• The Minister reserves the right to terminate the agreement in the event that the Technical Evaluation Committee determines that some of the milestones could not be achieved.• If a milestone is not met, NRCan will not release the payment associated with that specific milestone. <p>Financial due diligence</p> <ul style="list-style-type: none">• NRCan will undertake financial due diligence on all semi-finalists. This will include looking at financial statements for the preceding two fiscal years, as well as the most recent interim internal financial statements and cash flow projections (if available). | <p><u>Phase 2 Projects in the UK</u></p> <ul style="list-style-type: none">• BEIS will fund Phase 2 projects located in the UK.• Phase 2 projects will be eligible for up to £1.6 million and BEIS will provide this grant programme within the terms of the <i>General Block Exemption Regulation</i> governing State aid (<i>Commission Regulation (EU) No. 651/2014</i>), which came into force on 1 July 2014 (GBER)—specifically Article 25 (Aid for research and development projects)¹.• Please carefully review Annex B, C, D and E for additional details on terms of funding for Phase 2 demonstration projects in the UK. <p>Financial viability checks</p> <ul style="list-style-type: none">• BEIS will undertake financial viability checks on all successful applicants. These will include looking at the latest independently audited accounts filed on the Companies House database.• Where a business is not required to file accounts with Companies House, other financial information may be requested to enable an appropriate financial viability review to be undertaken. We will be looking for evidence of your ability to resource the project appropriately, so the information we request will be focused on understanding how your business operates in this respect.• Before your project starts, BEIS will ask for evidence that you have the funding mechanisms in place to manage your cash flow across the life of your project. This could include letters of credit or other such mechanisms. We do not expect you to have cash deposits to cover the entirety of your project at the start. However, if you do not complete your project due to cash flow problems that you could have anticipated and managed, we may request repayment of any grant already issued to you. |
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¹<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0651&from=EN>.

- It will also require a letter of credit or bank reference letter from a relevant financial institution or parent company showing guarantees relating to the applicant's or any project partners' credit (if no public credit ratings are available).
- Proponents will be required to submit documentation and a corresponding dollar value relating to any of the following (if applicable):
 - Any current or potential litigation;
 - Any significant commitments and contingencies outside the normal course of business; and
 - Description of any other significant projects under consideration or currently being undertaken by the applicant.

Notification and information sharing

- Applicants will be informed by email whether their application has been successful, subject to compliance with the terms and conditions of the Conditional Contribution Agreement.
- NRCan may wish to publicize the results of the Challenge, which may involve engagement with the media. At the end of the application and assessment process, NRCan may issue a press release or publish a notice on its website. These public documents may, for example, outline the overall results of competitions and describe some of the projects to be funded.
- NRCan may share information from applications with other Canadian and UK government agencies or departments.
- Some organizations may want their activities to remain confidential and will be given a chance to opt out of any involvement in media relations activity and further case study coverage of projects, should they see this as being absolutely necessary. However, the public description of the project you provide in your application will be made available in the public domain if your application is successful, and you are not able to opt out of the project description being published.

- BEIS will not make payments in advance of need and typically makes grant payments in arrears on satisfactory completion of agreed milestones and outputs. BEIS understands, however, the difficulties that small businesses may face when financing this type of project. BEIS will explore cash flow issues with the applicant as part of developing the financial and milestone profile during the Grant Award process. BEIS will offer flexibility in terms of profiles and payments, within the confines of the requirements for use of public money within which it operates.

Notification and information sharing

- Applicants will be informed by email whether their application has been successful, subject to compliance with the terms and conditions of the Conditional Grant Offer.
- BEIS may wish to publicise the results of the scheme, which may involve engagement with the media. At the end of the application and assessment process, BEIS may issue a press release or publish a notice on its website. These public documents may, for example, outline the overall results of competitions and describe some of the projects to be funded.
- BEIS may share information from applications with other UK government departments or with Ofgem.
- Some organisations may want their activities to remain confidential and you will be given a chance to opt out of any involvement in media relations activity and further case study coverage of projects, should you see this as being absolutely necessary. However, the public description of the project you provide in your application will be made available in the public domain if your application is successful, and you are not able to opt out of the project description being published. In addition, all funded projects must include reporting and dissemination milestones—agreed with BEIS—as part of their project deliverables.
- Any organisation that wishes to publicise its project, at any stage, must contact the Competition Project Manager or their Project Monitoring Officer at BEIS before doing so.

Project monitoring, knowledge sharing and evaluation

There will be a number of reporting requirements on project teams during the course of the project, including after the final payment milestone:

- Reporting: To track project progress and ensure payments are made according to a schedule of milestones to be agreed with selected projects. This reporting will be in confidence to NRCan and its technical advisers and will not be published. Any changes to schedules or project plans will need to be discussed with NRCan and applicants should expect significant interaction with the NRCan team during the project;
- Evaluation of the project: Successful applicants will be expected to participate in an evaluation of the project during and after final grant payments to assess the impact of the scheme, including value for money. This will include the requirement to participate in a third-party audit of the project; and
- Knowledge sharing: Effective dissemination and knowledge sharing are important requirements in this Competition—and applicants will be assessed on the scope and scale of their proposed knowledge sharing activities.

Project monitoring, knowledge sharing and evaluation

There will be a number of reporting requirements on project teams during the course of the project, including after the final payment milestone:

- Reporting: To track project progress and ensure payments are made according to a schedule of milestones to be agreed with selected projects. This reporting will be in confidence to BEIS and its technical advisers and will not be published. Any changes to schedules or project plans will need to be discussed with BEIS and applicants should expect significant interaction with the team during the project;
- Evaluation of the scheme: Successful applicants will be expected to participate in an evaluation of the scheme during and after final grant payments to assess the impact of the scheme, including value for money;
- Knowledge sharing: Effective dissemination and knowledge sharing are important requirements in this Competition—and applicants will be assessed on the scope and scale of their proposed knowledge sharing activities.

Confidentiality and freedom of information

- Where any request is made to BEIS under the *Freedom of Information Act 2000* (“FOIA”) for the release of information relating to any project or applicant, which would otherwise be reasonably regarded as confidential information, then BEIS will notify you of the request as soon as we become aware of it. An applicant must acknowledge that any lists or schedules provided by it outlining information it deems confidential or commercially sensitive are of indicative value only and that BEIS may nevertheless be obliged to disclose information that the applicant considers confidential.
- All assessors used during the assessment of applications will be subject to a confidentiality agreement.

4.2 Final Evaluation and Selection of the Winner

- The finalist teams will be required to submit a third party audit of their demonstration projects. They will be evaluated on the performance of their solution, giving consideration to the same set of criteria used in the evaluation of demonstration project proposals at the end of Phase 1. NRCan and BEIS reserve the right to provide additional requirements for the final evaluation prior to the start of Phase 2 of the Challenge. Additional details on the final evaluation will be made available on the Impact Canada website: <http://impact.canada.ca>.
- The \$1 million prize will be awarded to the finalist team whose demonstration project exhibits the best-in-class performance and end-user satisfaction. Finalists will be evaluated and ranked by the Technical Evaluation Committee. The winner will be selected by NRCan and BEIS. The winning team will then be subject to a grant agreement, whose terms and conditions will be negotiated between NRCan and the winner. In addition, BEIS and NRCan will support the finalists via various mechanisms, such as opportunities to pitch investors at showcase events.

ANNEX A – CONSENT FOR INFORMATION SHARING

By submitting a proposal, you agree to the information provided in your application, including personal data, being used as described in the Privacy Section of the Canada-UK Power Up Challenge Applicants Guide, and as indicated in this form.

Do you agree that Natural Resources Canada (NRCan) and the UK Department for Business, Energy & Industrial Strategy (BEIS) may access the information included in this document [required for consideration in the Challenge]:

YES ____

Do you agree that Natural Resources Canada (NRCan) and the UK Department for Business, Energy & Industrial Strategy (BEIS) may share any information provided for the purposes of the Power Up Challenge with other funding entities of the:

- Government of Canada
- Government of the United Kingdom
- Provincial, territorial, or municipal governments
- Not-for-profit sector (e.g. Sustainable Development Technology Canada, the Green Municipal Fund).

YES ____

Do you agree that Natural Resources Canada (NRCan) may share any information provided for the purposes of the Challenge with the Government of Canada’s Clean Growth Hub? The Clean Growth Hub is a whole-of-government focal point for clean technology focused on supporting companies and projects.

YES ____

Full Name: _____

Address: _____

Signature: _____

Date: _____

Please complete and attach this form to your submission in order for information to be shared.

ANNEX B – Technology Readiness Levels (TRLs)

Technology readiness levels are an indication of the maturity stage of development of particular technology on its way to being developed for a particular application or product. The table below provides a definition of Technology Readiness Levels 1 to 9.

| | |
|--|--|
| TRL 1 – Basic Research | Scientific research begins to be translated into applied research and development. |
| TRL 2 – Applied Research | Basic physical principles are observed; practical applications of those characteristics can be 'invented' or identified. At this level, the application is still speculative: there is not experimental proof or detailed analysis to support the conjecture. |
| Applied research and development | |
| TRL 3 – Critical Function or Proof of Concept Established | Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative. |
| TRL 4 – Laboratory Testing/Validation of Component(s)/ Process(es) | Basic technological components are integrated to establish that the pieces will work together. |
| TRL 5 – Laboratory Testing of Integrated/Semi-Integrated System | The basic technological components are integrated with reasonably realistic supporting elements so it can be tested in a simulated environment. |
| Demonstration | |
| TRL 6 – Prototype System Verified | Representative model or prototype system is tested in a relevant environment. |
| TRL 7 – Integrated Pilot System Demonstrated | Prototype near or at planned operational system, requiring demonstration of an actual system prototype in an operational environment. |
| Pre-commercial deployment | |
| TRL 8 – System Incorporated in Commercial Design | Technology is proven to work; actual technology completed and qualified through test and demonstration. |
| TRL 9 – System Proven and Ready for Full Commercial Deployment | Actual application of technology is in its final form; technology proven through successful operations. |

Annex C – BEIS Eligible Costs for UK-Based Projects and Feasibility Studies

General Requirements

Timing: In addition to the requirements of the *EU General Block Exemption Regulation*, BEIS will provide the grant only to cover eligible costs incurred and defrayed in the period between acceptance of the BEIS grant or the project start date specified in the grant offer letter and the deadline specified in the grant offer letter for completion of the project.

Who can incur eligible costs: The definition of eligible costs includes the applicant's own costs, eligible costs incurred by consortium members and eligible costs incurred by companies sub-contracted to the applicant or consortium members.

Use of contractors: BEIS would not normally expect to see contractors in key posts, e.g. CEO, FD, etc., within the applicant company or consortium members. Exceptionally, where BEIS is willing to fund a project that includes contractors in key posts, the day rate attributable to the project must be agreed with BEIS at the outset and cannot be varied without written agreement.

Non-sterling costs: Costs must be denominated in GB pounds. If relevant, applicants should indicate where conversion has been made to GB pounds from other currencies and indicate the conversion rate and assumptions used.

List of Eligible Costs

Under Article 25(3) of the *EU Block Exemption Regulation*², eligible costs are defined as the following:

- a. Personnel costs: Researchers, technicians and other supporting staff to the extent employed on the project;
- b. Costs of instruments and equipment to the extent and for the period used for the project. Where such instruments and equipment are not used for their full life for the project, only the depreciation costs corresponding to the life of the project, as calculated on the basis of generally accepted accounting principles, are considered as eligible;
- c. Costs of buildings and land, to the extent and for the duration period used for the project. With regard to buildings, only the depreciation costs corresponding to the life of the project, as calculated on the basis of generally accepted accounting principles, are considered as eligible. For land, costs of commercial transfer or actually incurred capital costs are eligible;
- d. Costs of contractual research, knowledge and patents bought or licensed from outside sources at arm's length conditions, as well as costs of consultancy and equivalent services used exclusively for the project;
- e. Additional overheads and other operating expenses, including costs of materials, supplies and similar products, incurred directly as a result of the project.

List of Non-Eligible Costs

Under no circumstances can the grant be claimed or used:

- a. For activities of a political or exclusively religious nature;
- b. In respect of costs reimbursed or to be reimbursed by funding from other public authorities or from the private sector;
- c. In connection with the receipt of contributions in kind (a contribution in goods or services as opposed to money);
- d. To cover interest payments (including service charge payments for finance leases);
- e. For the giving of gifts to individuals, other than promotional items with a value of no more than £10 a year to any one individual;
- f. For entertaining (entertaining for this purpose means anything that would be a taxable benefit to the person being entertained, according to current UK tax regulations);
- g. To pay statutory fines, criminal fines or penalties; or
- h. In respect of VAT that you are able to claim from HM Revenue and Customs.
- i. Contractors in key roles: BEIS would not normally expect to see contractors in key posts, e.g. CEO, FD, etc. Exceptionally, where BEIS is willing to fund a project that includes contractors in key posts, the day rate attributable to the project must be agreed with BEIS at the outset and cannot be varied without written agreement.

² <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0651&from=EN>

Annex D – BEIS Reasons for Exclusion

If you cannot answer ‘no’ to every question in the table below, it is very unlikely that your application will be accepted and you should contact us for advice before completing the Competition Application form.

| Has your organisation or any directors or partner or any other person who has powers of representation, decision or control been convicted of any of the following offences? | Answer |
|--|--------|
| a. conspiracy within the meaning of section 1 or 1A of the Criminal Law Act 1977 or article 9 or 9A of the <i>Criminal Attempts and Conspiracy (Northern Ireland) Order 1983</i> where that conspiracy relates to participation in a criminal organisation as defined in Article 2 of <i>Council Framework Decision 2008/841/JHA</i> ; | |
| b. corruption within the meaning of section 1(2) of the <i>Public Bodies Corrupt Practices Act 1889</i> or section 1 of the <i>Prevention of Corruption Act 1906</i> , where the offence relates to active corruption; | |
| c. the offence of bribery, where the offence relates to active corruption; | |
| d. bribery within the meaning of section 1 or 6 of the Bribery Act 2010; | |
| e. fraud, where the offence relates to fraud affecting the European Communities’ financial interests as defined by Article 1 of the <i>Convention on the protection of the financial interests of the European Communities</i> , within the meaning of: | |
| i. the offence of cheating the Revenue; | |
| ii. the offence of conspiracy to defraud; | |
| iii. fraud or theft within the meaning of the Theft Act 1968 , the <i>Theft Act (Northern Ireland) 1969</i> , the <i>Theft Act 1978</i> or the <i>Theft (Northern Ireland) Order 1978</i> ; | |
| iv. fraudulent trading within the meaning of section 458 of the <i>Companies Act 1985</i> , article 451 of the <i>Companies (Northern Ireland) Order 1986</i> or section 993 of the <i>Companies Act 2006</i> ; | |
| v. fraudulent evasion within the meaning of section 170 of the Customs and Excise Management Act 1979 or section 72 of the Value Added Tax Act 1994 ; | |
| vi. an offence in connection with taxation in the European Union within the meaning of section 71 of the <i>Criminal Justice Act 1993</i> ; | |
| vii. destroying, defacing or concealing of documents or procuring the execution of a valuable security within the meaning of section 20 of the <i>Theft Act 1968</i> or section 19 of the <i>Theft Act (Northern Ireland) 1969</i> ; | |
| viii. fraud within the meaning of section 2, 3 or 4 of the <i>Fraud Act 2006</i> ; or | |
| ix. making, adapting, supplying or offering to supply articles for use in frauds within the meaning of section 7 of the <i>Fraud Act 2006</i> ; | |
| f. money laundering within the meaning of section 340(11) of the <i>Proceeds of Crime Act 2002</i> ; | |
| g. an offence in connection with the proceeds of criminal conduct within the meaning of section 93A, 93B or 93C of the <i>Criminal Justice Act 1988</i> or article 45, 46 or 47 of the <i>Proceeds of Crime (Northern Ireland) Order 1996</i> ; or | |
| h. an offence in connection with the proceeds of drug trafficking within the meaning of section 49, 50 or 51 of the <i>Drug Trafficking Act 1994</i> ; or | |
| i. any other offence within the meaning of Article 45(1) of <i>Directive 2004/18/EC</i> as defined by the national law of any relevant State. | |

Annex E – UK Funding Levels and State Aid Requirements

This Challenge will be operated in accordance with the terms of the revised *General Block Exemption Regulation* governing State aid (*Commission Regulation (EU) No. 651/2014*), which came into force on 1 July 2014 (GBER) – specifically Article 25 (Aid for research and development projects)³.

E.1 Grant intensity guidelines

The Challenge will be delivered as a UK grant programme within the terms of the GBER, specifically, Article 25 (Aid for research and development projects) will apply and this will define the type of innovation activities that can be funded and will limit the amount of funding that can be provided to each participant in a funded project.

The Challenge will fund feasibility studies (for Phase 1) and industrial research (for Phase 2) as defined in the GBER and outlined below:

Feasibility study means “the evaluation and analysis of the potential of a project, which aims at supporting the process of decision-making by objectively and rationally uncovering its strengths and weaknesses, opportunities and threats, as well as identifying the resources required to carry it through and ultimately its prospects for success.”

Industrial research means “the planned research or critical investigation aimed at the acquisition of new knowledge and skills for developing new products, processes or services, or for bringing about a significant improvement in existing products, processes or services. It comprises the creation of components part of complex systems, and may include the construction of prototypes in a laboratory environment or in an environment with simulated interfaces to existing systems as well as of pilot lines, when necessary for the industrial research and notably for generic technology validation.”

The funding levels applied for must be consistent with the appropriate GBER aid intensity levels in Article 25, which are summarised in Table 1—although these are maximum spending levels and BEIS may decide to provide less than the maximum in order to strengthen leverage and value for money, depending on the specific project requirements.

Table 1: Maximum public funding for projects in the Challenge

| Research category | Type & size of applicant | Maximum amount of public sector funding towards eligible project costs |
|---|---|--|
| Feasibility study | Small enterprise | 70% |
| | Medium enterprise | 60% |
| | Large enterprise | 50% |
| Industrial research – Companies in Collaborations (i.e. consortium made up of either several businesses, including at least one SME; or business(es) and at least one research organisation) Note: Certain conditions must be fulfilled for collaboration (See section 5.3 below & Article 25(6) of the <i>Block Exemption</i> ⁴) | Small enterprise | 80% |
| | Medium enterprise | 75% |
| | Large enterprise | 65% |
| Industrial research – Universities or Research Organisations in Collaborations | Universities or research organisations [defined as collaborative fundamental research projects in GBER Article 2 (84)] may be entitled to receive full funding for their eligible project costs as long as they are not undertaking any economic activities in the project. University and research organisations should confirm the funding position with BEIS prior to application. | |

^{3,4} <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0651&from=EN>

Note: State aid compliance is a legal requirement and the risk of non-compliance rests with the grant recipient⁵. It is therefore crucial that you address State aid fully within the application, as any errors at this stage may result in BEIS being able to offer only a reduced level of funding or repayment of grant by applicants.

E.2 Public funding

When considering levels of aid intensity (described above in section E.1), public funding includes the grant and all other funding from, or which is attributable to, other government departments, UK public bodies, other governments or EU institutions. Such funding includes grants or other subsidies made available by those bodies or their agents or intermediaries (such as grant funded bodies).

In applying to this Challenge, you must state if you are applying for, or expect to receive, any funding for your project from public authorities (in the UK or in other governments) or the EU or its agencies. Any other public funding will be cumulated with BEIS funding to ensure that the public funding limit and the aid intensity levels are not exceeded for the project.

Whilst BEIS will check the information provided to try and ensure that applicants meet the requirements of State aid, applicants should establish that they fall within the State aid rules before submitting applications. BEIS requires applicants to notify them of any change to their situations or circumstances during the project.

If there is a breach of State aid regulations, for whatever reason, the European Commission requires repayment of any grant received, including interest, above that which was due. In this situation, applicants will be required to repay any funding received. It is also important to ensure that the total grant funding for the project from public sources (including from the European Commission) does not exceed the relevant permitted GBER aid intensity levels.

As part of the assessment process, the added value and additionality of public funding will be tested. Applicants will need to demonstrate why public funding is required to deliver this project.

E.3 Collaborative projects

Under the GBER Article 25 regulation, additional public funding (up to 15%) can be awarded to participants in collaborative projects (not feasibility studies) as long as they meet one of the following conditions:

“(i) the project involves effective collaboration:

— between undertakings among which at least one is an SME, or is carried out in at least two Member States, or in a Member State and in a Contracting Party of the EEA Agreement, and no single undertaking bears more than 70% of the eligible costs, or

— between an undertaking and one or more research and knowledge-dissemination organisations, where the latter bear at least 10% of the eligible costs and have the right to publish their own research results.

(ii) the results of the project are widely disseminated through conferences, publication, open access repositories, or free or open source software.

⁵The UK's rights and obligations of EU membership, including compliance with State aid rules, continue to apply until the UK's exit from the EU has been completed, and therefore for this Challenge.

Annex F: Financial Risk Assessment Report

The following information must be included for the applicant and any major financial contributors to the project (excluding governments & academia) in a report and submitted as part of the application. For further guidance, please contact the Challenge team at nrcan.cleantechimpact-impacttechpropres.nrcan@canada.ca.

1. Organizational description – Including, but not limited to, the following:
 - a. A description of what the applicant does (i.e. industry, product/service offering);
 - b. Number of employees in the applicant organization (at time of application);
 - c. When the applicant incorporated and where it is located;
 - d. Whether the company is privately held or publicly traded;
 - e. Indicate whether the applicant is a wholly owned subsidiary and provide information on the parent company (e.g. name, industry, location, etc.); and
 - f. If the applicant is not a wholly owned subsidiary, indicate who the majority shareholders are (include capitalization table).
2. Financial statements (including balance sheet, income statement, cash flow, notes to the financial statements and, if available, management discussion and analysis) for the preceding two fiscal years. If available, please include the most recent interim internal financial statements and cash flow projections. If financial statements are publicly available, you may refer to the location on your website where they can be found.
3. Letter of credit or bank reference letter from the relevant financial institution or parent company showing guarantees relating to the applicant's or any project partners' credit (if no public credit ratings are available).
4. Documentation and a corresponding dollar value relating to any of the following (if applicable):
 - a. Any current or potential litigation;
 - b. Any significant commitments and contingencies outside the normal course of business; and
 - c. Description of any other significant projects under consideration or currently being undertaken by the applicant.