Applicant Guide

Net Zero Emerging Concepts and Technologies – Prince Edward Island (ECT-PEI): Clean Technology Challenge

Call Opens: March 25th, 2025
Proposals due: May 1st, 2025 **(3:00 pm ADT)**

Contents

1. Program Rationale

Atlantic Canada will not get to net-zero by 2050 without proven renewable energy and energy efficiency technologies. There are still significant knowledge and technology gaps that must be identified and addressed to tackle the most hard-to-abate greenhouse gas emissions (GHG) in the 2030-2050 period.

Many of the solutions required to achieve PEI's 2040 net-zero goals still will need to be adapted, invented, proven and scaled up to achieve further reductions in GHG emissions. Bringing critical, emerging technologies and concepts from the laboratory to the market may take decades to achieve. Given the critical importance of action during the next 10 years and the time that it typically takes for emerging technologies to get from the laboratory to market, Atlantic Canada cannot afford to wait for market incentives to deliver the level of change required.

The **Net Zero Emerging Concepts and Technologies - Prince Edward Island (ECT-PEI): Clean Technology Challenge** will help to expedite this process. The ECT-PEI Clean Technology Challenge seeks to identify gaps in GHG emissions reduction pathways for hard-to-abate emissions and prioritize solutions to reduce GHG in the post 2030-period.

Net Zero Atlantic, the ECT Research Program administrator, is a leading energy research organization advancing Atlantic Canada's transition to a low-carbon future. Our focus is on advancing research that will help decarbonize our region's economy, mitigate climate change impacts, and move PEI towards net-zero emissions by 2040. As a member of the 50-30 Challenge, Net Zero Atlantic is committed to increasing workforce diversity in the energy sector.

2. Program Objectives and Expected Outcomes

The primary objective of the ECT-PEI Clean Technology Challenge is to encourage and fund the research and innovation community (both private and academic sectors) to identify and develop a suite of promising, emerging clean technologies, approaches and practices that warrant continued funding from PEI's technology incubation ecosystem.

The ECT-PEI Clean Technology Challenge has the following objectives:

1. Identify knowledge gaps to eliminate or offset the hard to abate GHG emissions (post 2030).
2. Advance promising technologies and approaches that can address the gaps to net zero.
3. Generate intellectual property that has the potential to address global demands for low-carbon solutions, thus creating economic opportunities for Prince Edward Island.
4. Encourage collaborative research among universities, community colleges, Indigenous-led institutions, the private sector, and others.
5. Foster collaborative thematic research networks that can attract national and foreign investment.

Expected ECT-PEI Clean Technology Challenge outcomes are:

- New knowledge, exportable intellectual property, patents and products that are scalable to commercialization that have the potential to address global demands for low-carbon solutions thus creating economic opportunities for Islanders.
- Development of projects that can lead to investment from national and foreign partnerships.
- Increased investment in PEI's economy with companies outside of the province creating a presence and providing full-time positions for the local job market.
- Development of products scalable to commercialization with potential for economic development for PEI.

3. Eligible Applicants

To be eligible to receive funding through the ECT-PEI Clean Technology Challenge, the Lead Proponent must be registered in Prince Edward Island. Partner organizations may be registered or based elsewhere in Canada or internationally. Proposals will be accepted from:

a. For-profit and not-for-profit organizations such as academic institutions, companies including sole proprietors, industry associations, research associations, utilities, electricity system operators, transmission system owners and operators

b. Indigenous organizations and groups

c. Community groups

The ECT-PEI Clean Technology Challenge encourages collaborative research within and between institutions and between academic, private sector and Indigenous organisations.

The following entities are not eligible to receive this funding: federal, provincial, territorial, regional, and municipal governments and their departments and agencies.

4. Funding

A total of $400,000 is available for the eighteen-month ECT PEI Clean Technology Challenge, not including contributions by Mitacs, which will be approved on a project-by-project basis as described in Section 7.2.

Funding is provided through Innovation PEI. Innovation PEI is the province of Prince Edward Island's lead economic development agency.

5. Priority Research Themes

There is a variety of ways to reduce, or eliminate emissions related anthropogenic sources. However, there are select sectors where Atlantic Canada may have the leading edge for innovation based on our industries and environment. In addition, research investments are given to sectors where there is the greatest potential to support Atlantic Canadian needs and climate goals. To focus the program efforts, the program's management committees have identified select Priority Research Themes (PRTs).

For consideration of award, applicants must propose a project to address a knowledge gap relevant to at least one program's PRTs.

The PRTs are listed below. These Themes are described in more detail in **Appendix 1**.

Theme 1: Clean Technology Implementation in Marine Applications

Theme 2: Clean Technology Implementation in Agriculture Applications

Theme 3: Grid Modernization

Theme 4: Battery Development and Long-Term Energy Storage

Theme 5: Hydrogen as an Alternative Fuel

For projects that touch on more than one Theme, Applicants are asked to pick the one Theme that is most applicable or relevant to their project. Applicants will be expected to identify the GHG reduction problem their research is intended to address, then describe project objectives, methodology and outcomes.

6. Eligible Activities

The ECT PEI Clean Technology Challenge seeks to identify and develop a suite of promising, emerging clean technologies, approaches and practices that warrant continued funding from Prince Edward Island's technology incubation ecosystem and private investment. The Challenge aims to support projects that face difficulties securing early-stage investment.

The following eligible activities may be undertaken during the course of a project.

1. Research, development, assessment, data gathering, testing and integration of novel and innovative equipment, software, methodologies or approaches, for example:

    a. Proof of concept of technologies where there is a significant technical risk, including field trials, bench-scale testing, pilot plants, and prototypes.

    b. Research and/or development of new or iterative methodologies.

    c. Analytical tools and modelling software.

    d. Other.

2. Pre-demonstration field testing – limited duration tests designed to develop the knowledge and understanding of the technology or approach including the development of monitoring and verification technologies and methodologies.

3. The installation of a pre-commercial technology; installation of equipment and/or infrastructure to support a demonstration or multiple demonstrations.

4. Modification of existing processes, equipment, or systems to accommodate an innovative technology or processes or commercial purposes.

5. Operation, performance testing, and analysis of pre-commercial equipment in its intended environment to assess performance of an innovation.

6. Execution of patent protection and legal support.

7. Execution of regulatory testing and approvals.

7. Process and Funding

7.1 Timing

The program has been funded for an initial research call. The following table outlines the important research call dates.

Table 1: ECT-PEI Clean Technology Challenge Milestone Dates

Item	Date
Information Webinar	March 20 2025
Research Call Opens	March 25 2025
Question Period Closes	April 25 2025
Research Call Closes	May 01 2025
Project Awards	June 2025
Contracting	June- August 2025

7.2 Mitacs Accelerate Umbrella Grant Funding

All submitted proposals are potentially eligible for additional (matching) funding through a pre-approved Mitacs Accelerate Umbrella grant established for this program[1]. Mitacs funding is available for currently enrolled students at the undergraduate, graduate and post-doctoral levels, as well as recent graduates within less than two (2) years of their graduation date. The Applicant should consider ECT-PEI Clean Technology Challenge timelines (18 months) when selecting student grant opportunities. Net Zero Atlantic (NZA) qualifies as a partner organization. Please list NZA as well as any other partner organization who will contribute to the Mitacs sponsorship.

The proposal submission template includes a section related to Mitacs applications. Students must already be secured at the time the proposal is submitted to the ECT-PEI Clean Technology Challenge. Proposals that seek Mitacs funding will go through a two-step approval process: review by the ECT Proposal Review Committee with all other proposals, and if selected for funding, a three-week review by Mitacs.

7.3 Eligible Costs

The ECT PEI: Clean Technology Challenge will fund up to 100% of eligible projects costs. Eligible project expenditures can begin once the Applicant has been notified that they have been selected for funding under the ECT-PEI Clean Technology Challenge, but no payments will be made until NZA, and the successful proponent have completed the contracting phase.

Eligible costs are described below. Funds can be used for research, proof-of-concept or prototype development, technology design and technology optimization, intellectual property development, and assessment of market potential. Funds can cover cost of researchers, contractors, technicians, students and post-doctoral researchers.

[1] To apply for matching Mitacs funding, the Applicant would use all or a portion of the funding requested from NZA or the Applicant's own cash contribution. Please see the 'Budget Submission Template' for instructions on how to show this in the submission.

Leverage and in-kind contributions will be evaluated on a project-by-project basis (see below). Equipment and other costs that are difficult to attribute directly to an individual project are generally ineligible but may be considered.

Eligible Expenditures

A. Salaries and Benefits

Eligible

- For employees on the payroll of the Lead Proponent for the actual time spent by employees on the project.
- Labour stipends for students (undergrad, Masters, PhD candidate) or recent graduates.
- A reasonable prorated share of benefits such as the employer's portion of Canada Pension Plan and Employment Insurance, health plan and insurance, Worker's Compensation, sick leave and vacation plus any other employer paid payroll related expenses.

Not Eligible

- Salary bonuses, performance pay, shares, stocks, stock options and the like.
- Incentives such as vehicle use and gym memberships.
- Salaries and benefits that have been reimbursed under other funding arrangements.

B. Contracting Services

Eligible

- Professional, technical, and scientific contracting services provided by partners, sub-contractors and consultants (i.e. not employees on the Lead Proponent's payroll).

Not Eligible

- Contractual services from a Lead Proponent's inter-related company.
- Items which have no relationship to the project, or which have been charged on an indirect basis in Overhead.
- Contracting services that have been reimbursed under other funding arrangements.

C. Capital Expenditures

Eligible

- Purchase, installation, testing and commissioning of qualifying equipment, materials and products, including diagnostic, testing tools and instruments.
- Materials consumed in carrying out the project, including those utilized in the production and operation of models, prototypes and pilot plants.

Not Eligible

- Items which have no relationship to the project, or which have been charged on an indirect basis in Overhead.
- Capital Expenditures that have been reimbursed under other funding arrangements.

D. Results Dissemination/Travel

Eligible

- Expenditures including meals and accommodation.
- Reasonable travel costs, including meals and accommodation necessary for project activities e.g. field trials and demonstrations at locations away from the Proponent's usual location.
- Conferences costs including travel, meals and accommodation **where project results are presented.**

Not Eligible

- Alcohol, entertainment and gifts.

E. Other Expenses

Eligible

- Printing services and translation.
- Data collection services, including processing, analysis and management.
- Elder Honoraria.

Not Eligible

- Education and outreach programs, training, workshops.

F. Overhead

Overhead expenditures which are directly related to the conduct of the project, and which can be attributed to it. Overhead expenditures cannot exceed a maximum of 15% of eligible expenditures[2]. Overhead expenditures include:

- Administrative and corporate support provided directly to the project by the Recipient's employee(s), including audit and similar professional fees.
- Routine laboratory and field equipment maintenance, based on the actual expenditure by a Recipient.
- Office operating expenses are directly related to the conduct of the project (e.g. faxes, telephone, photocopies, and office equipment).

[2] The overhead calculation excludes funding paid to Mitacs.

Not Eligible

- Utilities (electricity, fuel, internet), rent.

A predetermined overhead percentage (based on evidence provided by the recipient of expected overhead expenditures at the time of contracting), may be set and subsequently applied to each claim, in order to avoid unnecessary administrative burden to funding recipients.

G. Taxes

GST, PST and HST minus of any tax rebate to which the recipient is entitled. NZA will pay applicable taxes in addition to the funding award amount to ensure the full funding amount is available for the project.

7.4 Leveraging Funds and In-Kind

Leveraging ECT-PEI Clean Technology Challenge funds with funds obtained elsewhere is encouraged and will be included among the evaluation criteria. Preference will be given to projects that leverage funding from non-government sources and projects that include participation by or inclusion of Indigenous partner organisations.

Cash and/or in-kind funding from other sources are not required to qualify for ECT-PEI Clean Technology Challenge. In-kind costs are ineligible for reimbursement.

In recognition that both private sector and academic researchers are competing for funding, NZA takes a restrictive view of in-kind contributions. In-kind support must be reportable by the proponent and easily verifiable, directly support the project, and fall into the same cost categories as identified for Eligible Expenditures.

Note that only one contract will be issued per project; it is the Lead Proponent's responsibility to contract with and disburse funds to their research collaborators.

8. How to Apply

The **deadline** for the ECT-PEI Clean Technology Challenge call for submissions is **May 01, 2025, at 3:00 pm ADT**.

Applicants are asked to download our *Proposal Submission* and *Budget Submission Templates* from the ECT website and fill out the project description and budget sections. Submissions are made online by uploading the proposal form to: https://netzeroatlantic.sharefile.com/r-rd6d2b345cd1d4d45b8c4ab0758ac0c3d . Proponents will receive a return email acknowledging receipt of submission on the day the call closes.

Submissions are to include the following three (3) files:

A. One (1) completed Proposal Submission in word format.

B. One (1) completed Budget Submission Template in excel format.

C. One (1) pdf compiling both the A and B.

All files must use the following naming structure:

- APPLICANT LAST NAME_Proposal_ECT_PEI_ YYMMDD
- APPLICANT LAST NAME_Budget_ECT_PEI_ YYMMDD
- APPLICANT LAST NAME_COMPLET PDF SUBMISSION_ECT_PEI_ YYMMDD

9. Questions and Clarifications

Net Zero Atlantic will accept questions from interested Applicants on an ongoing basis until 5 pm AST, Friday April 25, 2025. Questioners will receive a direct email response from NZA, and all questions and answers will be posted anonymously on the NZA website FAQ.

Please submit your questions by email to the NZA Program Coordinator at info@netzeroatlantic.ca. Please do not contact Innovation PEI with questions.

10. Proposal Contents

As outlined in the Proposal Submission Template, all proposals must include:

1. **Scope Statement:** A statement of the project's research objective(s).

2. **Knowledge Gap and PRT Alignment:** A description of how the proposed work will address the knowledge gap(s) in **one** of the Priority Research Themes in **Appendix 1** and how addressing the knowledge gaps will result in economic benefits for Prince Edward Island. Applicants should outline the residual benefit of the program to PEI in their application.

3. **Work scope:** A description of the research methodology by task including the expected time needed to complete each task. This section will be used in the contract with successful Applicants, so Applicants must use a structured approach that lists, for example, tasks or work packages, their duration and expected outcomes.

4. **Risk:** A description of perceived risks to project success, such as risk in securing needed personnel and/or additional funding or leverage, risks to project timing, safety or environmental-related risks, along with how the Applicants will manage these risks should they arise.

5. **Team:** A summary of key research team members' expertise and their roles in the project (CVs not required).

6. **Budget:** A budget presented on the template provided.

7. **Planned Outcomes:** A description of project outcomes and a plan to disseminate outcomes and deliverables to knowledge consumers (e.g., via project reports, theses, presentations at conferences, etc.) to ensure and facilitate the distribution and uptake of ECT-PEI Clean Technology Challenge outcomes. Planned outcomes should include an outline of the business strategy for the project concept/technology.

8. **EDIA:** A statement regarding how the ECT-PEI Clean Technology Challenge Equality, Diversity, Inclusion and Accessibility (EDIA) expectations will be met (Section 11).

In fairness to other Applicants, a winning proponent is expected to complete the project as proposed in their original application. Once a project commences, NZA reserves the right to decline any modifications to the project budget, schedule or tasks requested. In addition, Applicants that commit to securing funds/in-kind leverage from other agencies, programs, etc. are expected to follow through with such plans. NZA reserves the right to cancel the contract in the event that pledged funding or leverage cannot be obtained.

11. Equity, Diversity, Inclusion and Accessibility Framework

The ECT-PEI Clean Technology Challenge seeks to support an inclusive and equitable transition to net zero emissions. Research carried out under the program must therefore support the pursuit of equity, diversity, inclusion, and accessibility (EDIA) in both research practice and in research project design. To support EDIA in research *practice*, proponents must take steps to consider EDIA in the hiring of and management of their research teams. To support EDIA in research *design*, proponents must ensure that they have taken relevant EDIA concerns (i.e., potential impacts of a project on equity-seeking communities) into account in the design of their research projects. Proponents will further be expected to report on EDIA outcomes at project close.

The Program administrators will use the following definitions in the evaluation of proposals.

> **Equity:** the removal of systemic barriers and biases that have contributed and currently contribute to disparities in opportunities and outcomes for diverse communities.
>
> **Equity-Seeking Groups:** communities that, due to historical and contemporary injustices, experience and seek to address barriers to equal access of resources and opportunities. These

communities include Indigenous peoples, racialized minorities, LGBTQ2S+ people, people with disabilities, and women in STEM fields.

Diversity: the presence of individuals, organizations, and communities with varying attributes including, but not limited to, race, ancestry, culture, language, gender identity, religion, sexual orientation, and ability.

Inclusion: the creation of an environment in which all individuals, particularly those identifying as belonging to an equity-seeking group, feel valued for their contributions and supported to fully participate.

Accessibility: the provision of conditions required to enable the participation of all individuals, particularly those identifying as belonging to an equity-seeking group.

Within the Proposal Submission Template, proponents will be asked to respond to the following questions, which will be scored during the evaluation process as described in Section 12.

EDIA in Research Practice

1. Do you or any of your co-applicants identify as belonging to an equity-seeking group?

   -Yes
   -No
   -Do not know
   -Prefer not to answer

2. If you plan to hire additional team members to work on the proposed project, what measures will you take to ensure that a diverse pool of candidates can access and apply for positions?

3. In the management of your team, how will you ensure that all team members have the support needed to fully participate in the research program and to access opportunities for networking and skill development?

EDIA in Research Design

1. If any of your research activities will be carried out at an offsite location and/or will require the participation of community members, what measures will you take to ensure that community needs and/or concerns are accounted for in the design and execution of your research project?

2. Could the outcomes of your research project impact (positively or negatively) equity-seeking groups? If so, what measures will you take to avoid any negative impacts and enhance benefits to those equity-seeking groups?

Note: This Framework assumes that EDIA in Research *Practice* will apply to all projects. However, EDIA in Research *Design* may not apply to all projects (i.e., if the research activities will not be conducted offsite and/or if the research activities and/or outcomes will have no significant impact on equity-seeking groups). In this case, the proponent will be asked at the proposal submission stage to explain and justify why EDIA in Research Design does not apply to their project.

12. Proposal Evaluation

Proposal evaluation panels will be managed by the Program Administrator and will include external subject matter experts as applicable. External reviewers will be asked to sign a Non-Disclosure Agreement (NDA) to protect commercially sensitive information and ideas.

The following criteria will be used to evaluate proposals:

Factor	Weight
1. Project Need and Responsiveness to the Applicant Guide (AG): a. Research objective clearly stated; b. Project aligns with one Priority Research Theme and proponent has articulated a real knowledge gap(s) and economic benefits to Prince Edward Island.	30%
2. Approach and Methodology: a. Proponent has outlined a clear and effective workplan that will achieve the stated objectives, and a sound approach in undertaking this project; b. Communication format and frequency are described; c. Proponent describes an achievable schedule with well-defined milestones and deliverables.	30%
3. Qualifications, Capabilities and Management: a. Experience and capabilities of the lead proponent and delivery team; b. Collaboration, team organisation and scale are appropriate for this project; c. Risks have been sufficiently assessed and managed.	15%
4. Budget, Leverage and Value: a. The budget is clear and complete and well described; b. The Team will offer leverage and good value for the proposed budget.	10%
5. Outcomes Dissemination and EDIA: a. Proposal includes a robust communication plan to disseminate findings; b. Proposal articulates measures to include EDIA in Research Practice; c. Proposal articulates measures to include EDIA in Research Design.	15%
Total:	100%

Confidentiality: *The successful Applicant herein authorizes Net Zero Atlantic to reveal the Applicant's name, title, affiliate institution, title and lay summary of the project, duration of support, and approved funding amount. Please indicate if the application contains any information, apart from rates and prices, that cannot be shared.*

Appendix 1: Priority Research Themes

Emerging Concepts and Technologies - Prince Edward Island (ECT-PEI): Clean Technology Challenge

Priority Research Themes

version. Winter 2025

This document describes current Priority Research Themes of the ECT PEI: Clean Technology Challenge. This list is current as of the date given above and may be updated with new or expanded Themes for subsequent calls. The research subjects and key issues listed below are not intended to be exhaustive nor restrict Applicants to consideration of these issues alone; other subjects proposed by the Applicant will be considered as long as they broadly fall within a Priority Research Theme.

All projects submitted to the ECT PEI: Clean Technology Challenge must align with one of these Themes. For projects that touch on more than one Theme, Applicants are asked to pick the one Theme that is most representative of their project. Applicants must identify the particular knowledge gap(s) within a Theme that will be addressed by their project. Applicants should consider the following points when designing their projects and address these points, as applicable, in their application:

1. For the 2030-2050 period, what are the expected sources of greenhouse gas (GHG) emissions in this sector in Prince Edward Island?
2. What are the gaps between what is currently being done and what needs to be done to ensure decarbonization targets are reached in this sector?
3. In what way(s) will your proposed project address these knowledge gap(s) and ultimately reduce GHG emissions in the province?
4. What economic benefits to Prince Edward Island will result by addressing the identified knowledge gap(s)?

Clean Technology Implementation in Marine Applications

The marine industry is core to the provincial economy, culture, and identity. Net-zero enabling technologies, such as advanced batteries and alternative fuels for marine transportation, remain at an early stage of development.

Some key issues when it comes to managing emissions include:

- Vessel/equipment upgrades to reduce fuel use.

- Adoption of fishing techniques, sensors and other equipment that reduce or replace bottom trawling.
- Adoption of best practices to improve resource harvest efficiency and thus achieve emissions reductions (e.g., better planning, use of science-based decision making, improving rule enforcement, implementing better monitoring programs, etc.).

Clean Technology Implementations in Agricultural Applications

Agricultural emissions, largely generated through non-combustion activities, defy easy abatement using standard mitigation strategies such as electrification and fuel-switching. Research and development are needed to accelerate the development of solutions that prevent and or/capture emissions from agricultural processes and scale-up their adoption in Prince Edward Island.

The main sources of emissions in this sector include:

- Enteric (ruminant) fermentation.
- Manure management.
- Liberation of N_20 from soils.
- 'Indirect emissions'.

Some of the main issues when it comes to managing emissions in this sector include:

- Development of zero-emissions farm machinery and equipment.
- Use of alternative energy sources.
- Efficiency of crop production.
- Enhancing carbon sinks (e.g., through reduction in tillage, restoring degraded land, improving pasture management, reducing fallow periods, managing residues, etc.).
- Reducing methane emissions (e.g., through extending lactation periods of dairy cows, using more efficient breeds, feed additives, improving reproductive performance, etc.).
- Reducing nitrous oxide emissions (e.g., through better measurements of N_20 loss, improvements to fertilizer management and application practices; greater use of legumes as a nitrogen source; use of cover crops to remove excess available nitrogen; adjusting tillage intensity, etc.).

Grid Modernization

With the focus on electrification, PEI, along with the Atlantic region are seeking innovative solutions for updating the reliability and efficiency of the power grid. This priority research theme is open to projects which address current and future challenges associated with PEI's power grid.

Areas that require innovation and investigation include:

- Grid Stability
- Integration or application of storage technologies
- Asset management and maintenance practices

Battery Development & Long-Term Energy Storage

Prince Edward Island is a winter-peaking, cold climate jurisdiction that has transitioned to a low-carbon electricity generation system powered by variable-output renewable energy (i.e., wind and solar). This makes Prince Edward Island vulnerable to supply interruptions during periods of limited solar and wind availability, which in turn necessitates the use of both short-term and long-term energy storage. Cost-effective long-term energy storage solutions are not yet commercially available. In addition, the technical and regulatory integration of long-term energy storage into the province's energy grid is still unexplored.

Some of the main issues with resulting implications for future GHG reduction include:

- Understanding the value that energy storage can provide in energy systems with large penetrations of variable renewables.
- Improving the capacity and longevity of lithium ion and other battery types.
- Assessing the technoeconomic system impacts of adopting compressed air or other storage opportunities.
- Understanding the applicability of thermal energy storage in residential, commercial and industrial buildings.

Hydrogen as an Alternative Fuel

Hydrogen is an energy carrier that has the potential to contribute to the reduction of GHG emissions in Atlantic Canada. For hydrogen to be accepted and widely used as an alternative fuel after 2030, work is required to further our knowledge on production techniques and applications that are reliable, economically feasible, and safe.

Areas that require innovation and investigation include:

- End use applications.
- Small scale production of hydrogen for use on site.
- Transportation and storage of hydrogen.
- Monitoring of equipment and transportation methods.

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