

Emerging Concepts & Technologies Research Program

Annual Report

Funding early-stage research focused on emissions reduction and economic development in Nova Scotia.

2024/25



ACKNOWLEDGEMENTS

The Net Zero Emerging Concepts & Technologies Research Program was developed and led by Net Zero Atlantic and supported with funding from Nova Scotia's Department of Environment and Climate Change, Natural Resources Canada – Office of Energy Research and Development, and Mitacs.

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Introduction to the ECT Research Program

Net Zero Atlantic is a non-profit organization leading applied research to advance Atlantic Canada to a net-zero future. To achieve the region’s net-zero goals, we recognize that many solutions need to be invented, proven, and scaled up to commercial availability. These solutions, which will bring critical, emerging technologies from the laboratory to the market may take decades to achieve. Therefore, Net Zero Atlantic has developed a three-year program titled the Emerging Concept and Technologies (ECT) Research Program that provides funding to early-stage research and development in Nova Scotia.

The Program will invest in research focused on new technologies and practices to help Nova Scotians meet our net-zero by 2050 target.

The ECT Research Program selects projects through two funding streams:

Stream 1 – Conceptual, early-stage genesis of novel technologies/concepts in Nova Scotia. The award value is up to a maximum of \$50,000 for a duration of 12 months for project execution.

Successful Stream 1 projects are eligible to compete for **Follow-on Funding (FOF)** of up to \$250,000.

Stream 2 – Evaluating technologies/concepts developed in other jurisdictions for suitability and adoption in Nova Scotia. The Award value is up to a maximum of \$130,000 for a duration of 18 months for project execution.



Photo: Members of the ECT-NS program join Minister Halman of Nova Scotia Environment and Climate Change to celebrate progress.



Objectives



IDENTIFY KNOWLEDGE GAPS

Identify knowledge gaps to eliminate or offset the hard to abate GHG emissions (post 2030).



TECHNOLOGIES & APPROACHES

Advance promising technologies and approaches that can address the gaps to net zero.



COLLABORATIVE RESEARCH

Encourage collaborative research among Atlantic Canadian universities and community colleges, Indigenous-led institutions, and the private sector.



INTELLECTUAL PROPERTY

Generate intellectual property that has the potential to address global demands for low-carbon solutions.



ATTRACTING INVESTMENT

Foster thematic research networks that attract investment.

ECT-NS Program to Date



\$3.6M

Total dollars awarded



169

Proposals received



\$1M

Dollars for Follow-on Funding



38

Projects awarded



\$2.6M

Dollars for projects awarded



16

Projects completed

4



Open research calls
(+1 Follow-on Funding round)





ECT-NS Applicants vs Awards



The ECT research program has administered a total of four (4) open research calls in Nova Scotia since its debut in 2023. Net Zero Atlantic has seen a consistent level of interest, averaging 39 applications per call.

Eligible applicants must be located in NS, looking to grow their business in the local ecosystem.

10

Follow-on Funding applications received

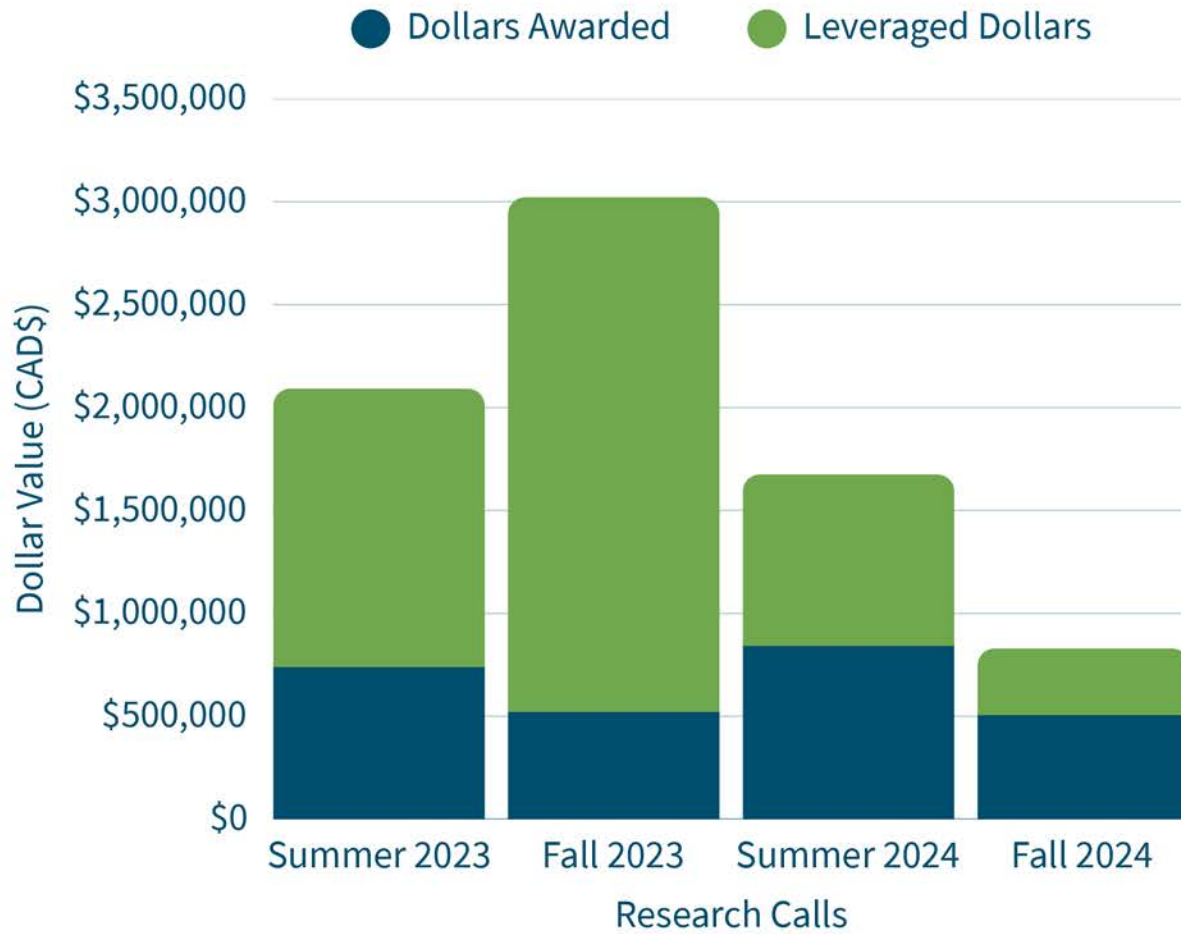
4

Projects Awarded

Applications



Funds Awarded and Leveraged Per Open Research Call



The investments in the ECT projects to date have unlocked an additional five million dollars (\$5M) in third party funding, contributing to a total program value in excess of eleven million dollars (\$11M).

Funds

Priority Research Themes

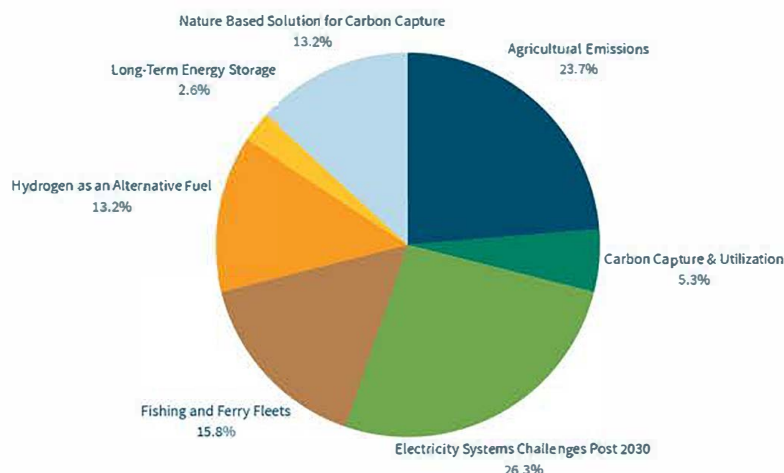
Before each open research call, the ECT team works with a Research Management Committee to select the priority research themes (PRT). Themes are selected based on provincial needs and the emerging markets. Applicants are encouraged to follow the themes, but applications are awarded based on proposal contents.

No quotas are set for each PRT. However, a comparison of charts for the PRT breakdown of awards vs. PRT breakdown of applications indicates that the PRT representation in projects selected are proportional to the demand seen in the proposals received.

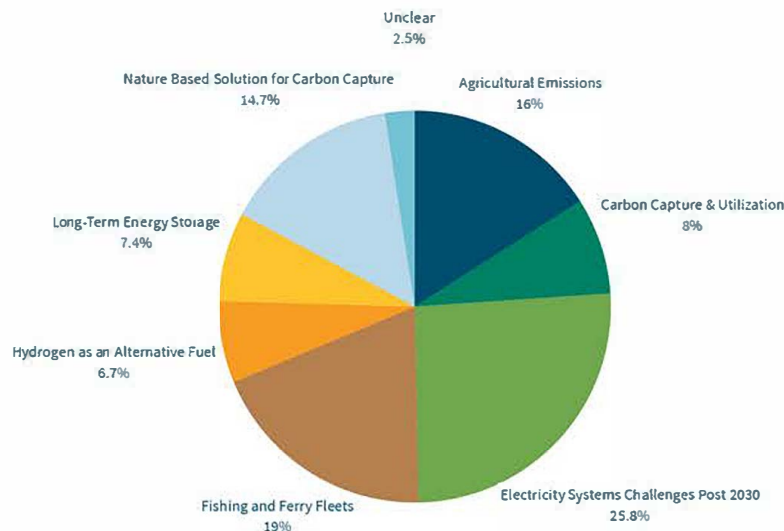
The top priority research themes represented in the ECT program are:

1. Electricity System Challenges
2. Decarbonization of the Agricultural Sector
3. Decarbonization of Fishing and Ferry Fleets

PRT Breakdown of Awards



PRT Breakdown of Applications



ECT-NS FY24/25

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2.3M+

Dollars awarded

93

Proposals received

22

Projects awarded

16

Projects completed

2

Open research calls
(+1 Follow-on Funding round)

Dollars Awarded in FY24/25

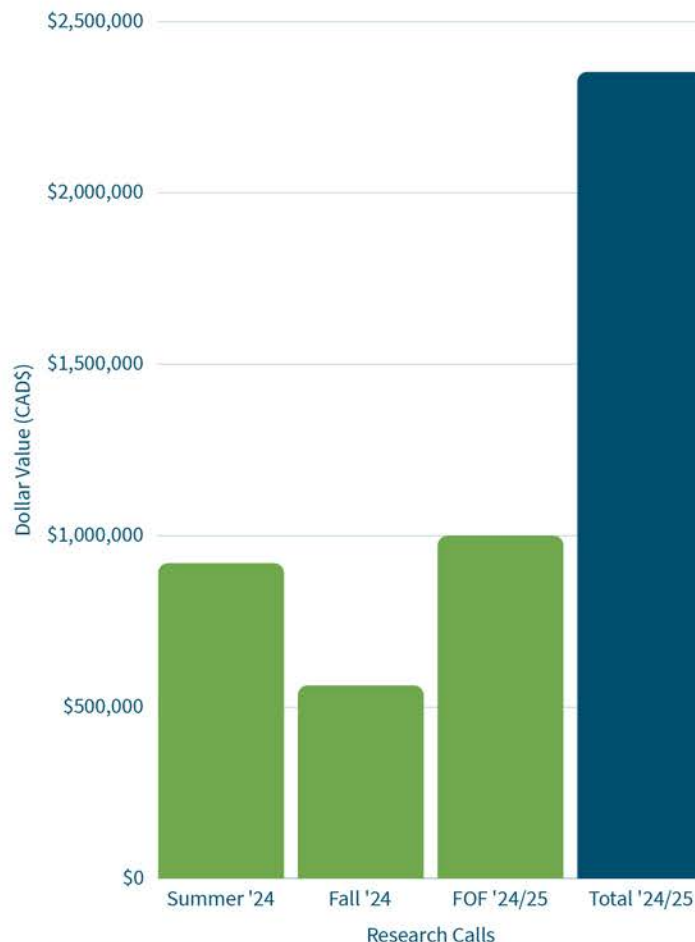


Figure 1 - Total dollars awarded per call and for the fiscal year 2024/25.

In the 2024/25 fiscal year, the ECT-NS Research Program issued two open research calls and one call for Follow-on Funding (FOF). The amounts awarded were \$840K+ for the Summer '24 call, \$508K+ for Fall '24, and \$1M for FOF '24/25.



Follow-On Funding

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Stream 1 projects completed prior to January 10th, 2025, were eligible to apply for the first round of Follow-on Funding of up to \$250K. The four (4) projects selected are highlighted below.

➤ Acuity Inc.

The Acuity team was awarded a \$50k Stream 1 grant in the Fall 2023 open research call. Allison Murray and team successfully finished the development of software to incentivize decarbonization of agriculture supply chain and has delivered their solution to market. The team will use the Follow-on Funding to build out with software for aquaculture industry.

Photo: Acuity's Allison Murray presents at the ECT Showcase.



Project: Enhancing net-zero recommendations for Nova Scotia aquaculture companies through AI and Machine Learning R&D



PRT: Agricultural Emissions



ECT Contribution: \$300K
Total Project Value: \$546K



Target Completion Date: Summer 2026

➤ Integrated Nanotech Inc.

"The ECT program has filled a critical gap in supporting the commercialization of technology in the CleanTech space in Atlantic Canada. The early-stage support enabled us to quickly move from an early proof-of-concept through to a fully functional prototype ready for market testing. Because of this, the ECT funding has enabled us to get to market significantly faster, helped us attract private investment, and allowed us to create additional high-quality jobs here in Atlantic Canada." - Hunter King, Founder & CEO

Photo: Integrative Nanotech's Brenden Nickerson presents at the ECT Showcase.



Project: HY-SECURES Hydrogen Sensors for Commercial Use to improve Reliability and Safety



PRT: Hydrogen as an Alternate Fuel Source



ECT Contribution: \$300K
Total Project Value: \$741K



Target Completion Date: Spring 2026



CarbonRun

“The ECT program has catalyzed CarbonRun's ability to innovate a new form of carbon dioxide removal and enabled us to explore new markets. Thanks to Net Zero Atlantic's support, we are now scaling this made-in-Nova Scotia climate solution across Canada and the world.” - Dr. Shannon Sterling, Founder, COO and CSO, CarbonRun

Photo: CarbonRun's Edmund Halfyard presents at the ECT Showcase.



Project: A Feasibility Study for Nature-Based Carbon Dioxide Removal Solutions at Nova Scotia Power's Hydroelectric Facilities



PRT: Nature-Based Solution for Carbon Sequestration



ECT Contribution: \$300K
Total Project Value: \$848K



Target Completion Date: Winter 2026

Dr. G. Manafiazar - DAL

A Dalhousie University team of researchers under the direction of Dr. Manafiazar have developed a sensing device and management practices for accurate herd level GHG emission rate monitoring. With the Follow-on Funding, Dr. Manafiazar and his team aim to refine the technology, validate its performance with a large-scale pilot test, and transition their technology from a prototype to a market-ready product for widespread adoption across the livestock (dairy, beef, swine, and chicken) industry.

Photo: Dr. Manafiazar presents at the ECT Showcase.



Project: Further development and field validation of IoT-based technology for GHG emissions measurement



PRT: Agricultural Emissions



ECT Contribution: \$300K
Total Project Value: \$406K



Partner: Dalhousie University



Target Completion Date: Fall 2026

Outreach Highlights



**SERIES OF OPEN
RESEARCH CALLS**



**IN-PERSON EVENTS
AND ON-SITE VISITS**



**TWO-PHASED
PROMOTIONS**



ECT Program: Maritimes

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The ECT-NS program has grown into a Maritime-wide initiative.

The inaugural open research call was for Nova Scotia in 2023. Since then, the program is now operating in New Brunswick and Prince Edward Island.

The timeline shows the total number of open research calls held to date for all Maritime provinces and the two future calls planned for 2025.

8

2025 Fall Call -
Nova Scotia

6

2025 Winter Follow-on
Funding Round 1 -
Nova Scotia

4

2024 Summer Call
- Nova Scotia

2

2023 Summer Call -
Nova Scotia

2025 Fall Follow-on
Funding Round 2 -
Nova Scotia

7

2025 Winter Call -
Prince Edward Island

5

2024 Fall Call -
Nova Scotia and
New Brunswick

3

2023 Fall Call -
Nova Scotia and
New Brunswick

1





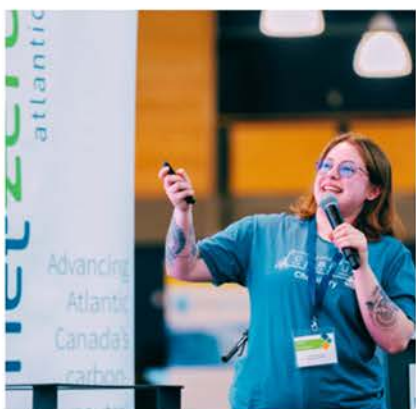
Events

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Funding Announcement

On April 30, 2024, a media event was held at the PIER in partnership with the Nova Scotia Department of Environment and Climate Change. This event was used to publicly announce the province's contribution to funding for the program and to reveal the Fall 2023 recipients.



Showcase

An R&D showcase event was held on February 6th 2024, celebrating the progress of research and business developments in Nova Scotia, funded through the ECT program. This was a public forum to share the results of eight of the completed projects. Attendees included representation from academia, private industry, investors and the program funders.



Student event

Over the course of the program Net Zero Atlantic has welcomed 20+ students to the PIER in Halifax to participate in our Lightning Talks & Speed Mentoring events. This event is held annually as a professional development opportunity for all ECT Mitacs Students. The event aims to hone students pitch presentations and networking skills.



Site Visits

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Net Zero Atlantic's ECT Research Program team enjoyed a series of site visits with funding recipients in their labs and field sites. The project teams were enthusiastic to share their work and project progress.



Ravindra Kempaiah, Zen Energy



Mita Dasog, DAL



Derek Lynch, DAL



Alison Thompson, DAL



Martin Mkandawire, CBU



Geniece Hallet-Tapley, St. FX



David Percival, Bragg Lumber Co



Ghader Manafiazar, DAL



Mason MacDonald, DAL

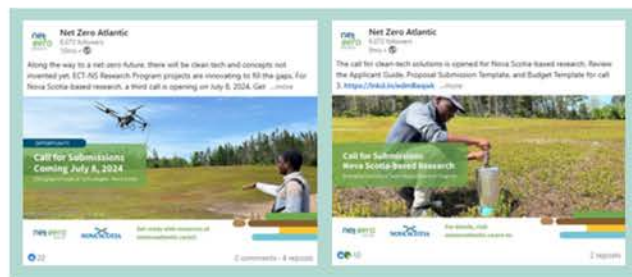


Promotions

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The ultimate objective of communications was to attract quality, on-target ideas. To achieve this aim, we issued clear and consistent communications on the program objectives and resources available.

Two-phase digital campaigns promoted the call for submissions. Phase 1 focused on awareness of the opportunity, driving potential applicants to resources for preparations. Phase 2 focused on the submission deadline.



Swipe-to-Know profiles of the projects underway demonstrated ECT's support for projects.



Newsletters answered common questions about the program were answers in newsletters and during open call question periods.





A Successful Year

The close of FY2024/25 marks the completion of the second year of the ECT program. This year saw many firsts - the first completed projects, product sales, media events, and showcases.

Net Zero Atlantic is proud to see the program grow from nineteen (19) to forty-two (42) projects. This growth is further supported by the increasing level of awareness of the ECT program throughout Atlantic Canada. This is reflected in the number of inquiries regarding the next call, and interest in the future of the program.

The past year saw the first round of Follow-on Funding (FOF). NZA was excited to select four of the ten FOF applications to receive \$250K in additional funding to continue their ECT project work. NZA is looking forward to see how these project teams impact the agricultural, hydrogen and carbon capture industries.

“The importance and long-term impact of investments in early-stage R&D cannot be overstated. The Emerging Concepts and Technologies Research Program has supported over 40 projects that are providing solutions to problems that are essential to meeting Nova Scotia’s emissions reductions goals while stimulating economic development. The team and I are excited to see the commercial successes that will be launched from the support of the program.” - Tim Bachiu, Director of Research, Net Zero Atlantic



Next Up



➤ Project Spotlights

With a focus on showing impact, Net-Zero Atlantic will publish on our social networks the various projects of diverse themes pushing Nova Scotia to its net-zero goal, while driving economic development in the region.

➤ Fall 2025 Open Call

Net Zero Atlantic is currently preparing for a 5th open research call in Nova Scotia. Announcements will be made in late Q1 with proposal deadlines.

➤ Follow-on Funding 2

The ECT program plans to award up to \$1,000,000 in Follow-on Funding for completed phase 1 projects to scale ideas and innovations up the TRL and be well positioned to compete in the investment space. This is planned for FY2025/26 Q3.

➤ ECT Showcase 2026

The ECT Program will continue to celebrate the progress of clean technology research and business development in the Atlantic region and the resources available to innovators. The R&D showcase event will occur in the second half of FY2025/26.



Our Team



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