

BC Bioenergy Network RNG Supply Chain Enhancement ARCTIC Challenge FAQ

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The Challenge Competition

What is the application deadline?

Applications will be received by Foresight up to February 28, 2018, 11:59 PM Pacific Time.

Who is eligible to participate in the Challenge?

Any organization is eligible to participate in the program so long as there are demonstrable benefits to developing and commercializing the innovation in Western Canada.

Innovators applying to participate do not require a current working relationship with BC Bioenergy Network or any company in the RNG or Agriculture sector.

What Technology Readiness Levels are relevant?

This Challenge will focus on advancing solutions/technologies at Technology Readiness Levels (“TRL”) 5-9. Partial solution submissions are encouraged and welcome. Through the ARCTIC program and its multiple stages the technology will be de-risked as it advances in maturity. This program references the Build in Canada Innovation Program definition of TRL:

<https://buyandsell.gc.ca/initiatives-and-programs/build-in-canada-innovation-program-bcip/program-specifics/technology-readiness-levels>.

What is the Evaluation Process?

Projects will be evaluated through four stage gates:

- **Stage Gate 1: Completeness.**
Applications received by Foresight will be reviewed for completeness and their ability to provide relevant information to a technical reviewer.
- **Stage Gate 2: Technical Review.**
Based on a review of submitted information, technical reviewers will assess the fit of the proposed technical solution against their ability to meet the criteria identified in the Challenge Application Package. Selected Applicants will be invited to Stage 3.
- **Stage Gate 3: Presentations.**
Presentations to the selection team will be invited in mid-March, 2018. These presentations will be via videoconference or in person in the Foresight or BCBN Offices. Stage 3 participants will receive more details on the specific elements their presentations need to address based on the feedback of reviewers and whether any additional supporting documents may be needed.

- **Stage Gate 4: Shortlist Due Diligence.**

Shortlisted applicants will be provided with supplementary questions and information requests to assist with the final selection committee decision. The focus of this stage of evaluation will be on the business and the project requirements.

A decision of the Selection Committee is anticipated by the end of the first quarter, 2018.

Where will the selection process meetings be, and what meetings will be needed?

There will be a selection committee that will consist of individuals from BCBN and Foresight ARCTIC. We may also utilize the skillsets of National Research Council Industrial Research Assistance Program (NRC IRAP) and other external experts. Meetings of the selection committee will occur as necessary to review the proposals and finalise the 2-5 Challenge Sprint participants. The presentation meetings from the individual companies would be scheduled either online or in person, with the location to be determined.

Will there be feedback on submissions?

Participants interested in receiving feedback on their submission will have an opportunity for a debrief meeting with Foresight at the conclusion of the selection process.

Participation

What support do innovators receive for participation?

The total funding available for projects supported through this call for proposals is up to **\$300,000** Canadian Dollars (CAD), subject to the discretion of Foresight Cleantech Accelerator Centre/ARCTIC and BCBN, and the availability of funds.

The Challenge “Sprint” Phase is designed to involve 2 to 5 proponents in advancing proposed solutions. The per project costs can go up or down based on the final number of projects in the Sprint. The maximum contribution includes provision for lab space and overheads, marketing, a lab manager, equipment, materials, accelerator mentoring and cash. The winner(s) of the Challenge Sprint will be invited to undertake the next step in the development of the innovation/field trial (or equivalent). The maximum contribution from ARCTIC and BCBN to this phase includes support for a test site, test support, equipment, materials and cash.

‘In kind’ contributions from candidates includes time of key project staff or other resources required to complete the Challenge Sprint stage.

Proceeds received by proponents from the program may be designated for specific deliverables or provided to offset the costs associated with a proponent's participation. These decisions will be based on the submitted proposal and the discretion of the Challenge sponsor (i.e., BCBN) and Foresight.

How will Intellectual Property be treated?

Background Intellectual Property (IP) of an applicant will remain the property of the applicant. Phase 3 Challenge Spring does not anticipate the development of any new IP by applicants. Applicants' participation in Phase 4 will be governed by an agreement with the industry partners that will address IP development in the Phase 4 Field Trial.

What role will past references play in the evaluation process?

The Selection Committee will use references to support the evaluation of proposals if they are provided.

Are partnerships between potential solution providers actively encouraged?

Yes, we are looking for a complete solution that hits the objectives of the request for proposals.

Will there be an FAQ update following the webinar?

Yes – it will be posted on the ARCTIC website under the BCBN Challenge.

Can you clarify the financial information that would need to be provided to determine the amount of financing that is provided?

The amount of financing information that is included in the proposal does not determine the amount of financing that is received. The amount that each company receives will be made as close to equal as it can be, depending on the number of companies that go into the sprint. The information in the proposal is for evaluating the financial viability. We expect companies to have enough cash flow to see them through the Challenge.

The Challenge Sponsors and the ARCTIC Program

What is ARCTIC?

The Advanced Resource Clean Technology Innovation Centre (ARCTIC) was established by Foresight in early 2015 to fulfill the need for a demand-pull approach to innovation targeting both specific environmental, operational and environmental challenges and potential sources of innovation from across Canada and marrying them to drive performance improvements and accelerate the commercialization of new technologies. ARCTIC model is a new approach for industry/innovator collaboration.

The ARCTIC program is funded with support from BC Innovation Council (BCIC), Western Economic Diversification (WD) and Canada's National Research Council's Industrial Research Assistance Program (NRC IRAP). In this Challenge, the ARCTIC program is working with BCBN to identify opportunities to improve the economics of on-farm anaerobic digestion technologies to foster the development of greater RNG production in British Columbia.

Where can I learn more about ARCTIC?

The website for ARCTIC is <http://arctic.foresightcac.com> where more information about the program and Open Challenges is available.

What is the Foresight Cleantech Accelerator Centre?

Foresight is a catalyst and connector, providing Canadian and international innovators with access to resources, expertise, talent and partners to mature and implement innovative solutions quickly. The Advanced Resource Clean Technology Innovation Centre (ARCTIC) is a Foresight program designed to fulfill the need for a demand-pull approach while identifying both specific environmental, operational and environmental challenges in the resource sector and potential sources of innovation from across Canada, and connecting them to drive performance improvements and accelerate the commercialization of new technologies. The ARCTIC program is funded with support from the British Columbia Innovation Council (BCIC) and Western Economic Diversification (WD). Foresight is located in Surrey, British Columbia, Canada.

What is the BC Bioenergy Network?

Since its establishment in 2008, BC Bioenergy Network (BCBN) has been the leading agency accelerating the demonstration of bioenergy technologies in the Province. This has been realized through project investment, championing the utilization of BC biomass, forming partnerships between B.C.'s research institutions and the private sector, attracting

international partnerships, and by actively communicating the importance and potential of bioenergy.

To achieve this, BC Bioenergy Network invests in capital and technology demonstration, targeted capacity building, as well as education and advocacy. These efforts promote the utilization of BC's biomass— specifically using waste streams in the forest, agriculture, and municipal sectors to produce energy and value-added products. To date, BCBN has invested \$15 million in 17 capital projects; \$1.4 million into 12 capacity-building projects; and more than \$375,000 into conferences, workshops and other educational initiatives.

As steward to one of the largest forested areas on earth, B.C. is well-positioned to become a major player in developing clean energy for the global bioenergy sector. BCBN is aligned with the B.C. Government's mission to decarbonize the economy. BCBN is focused on implementing innovative solutions involving low-carbon renewable fuel supply chains. Current areas of focus include the RNG supply chain and decarbonizing long-distance transportation including the marine, aviation, rail and trucking sectors.

Additional Relevant / Technical Information

Would foreign technologies be eligible?

Yes, as long as there is lasting benefit to Western Canada. This usually sees proponents required to make a commitment to have a presence in Western Canada.

Is the anaerobic digestion process limited to dairy manure or are other types of manure also allowed?

Most AD systems are not economic with manure alone. Under BC regulations, farms can be permitted to bring up to 49% of off-farm waste on to the farm to incorporate into the anaerobic digester to increase biogas production. Poultry litter and swine manure can be used/and or incorporated if the business case is feasible.

There is a dairy farm AD facility in BC willing to provide support to participants in this Challenge Sprint and Field Trial. Proponents should identify what other manures and/or feedstocks their solution may address.

Is there a preference to focus on the treatment of either the liquid by-product or the cake?

Either is relevant and understanding the value your solution provides may also help identify potential collaboration opportunities we may see with other solution providers to result in a more complete solution.

We are interested in digestate as a whole, either concentrating materials or extracting nutrients for easier / cheaper transport and/or creating more valuable products to be sold to offset the cost of the process.

Is there a specific water quality target or what would be the intended use of that by-product?

There is no specific target, but that water quality would ultimately depend on the farm. Extracting all nutrients would limit on-farm uses. Though safe discharge to waterways would be a good outcome, the cost effectiveness of the solution would drive the relevance of the solution.

Can the solution be a net producer of energy?

Yes, however, the impact on the overall system, or system outputs, such as biogas or nutrients should be explained.

Would Field Trials be possible to start during Phase 3, the Sprint Phase?

Yes, if the solution is ready for field validation.

Are existing technologies applied in other sectors eligible, e.g., a solution from industrial waste water treatment migrated into Agriculture?

Yes, such technology migration is encouraged if it does not create a challenge for use of agricultural land. Question 2.6 of the Response Template allows a direct response to this point.

Are collaborations and consortiums accepted as part of the proposals?

Yes, as part of the application and during the evaluation process the selection committee will review proposal with a view to potential collaborations to address gaps.

Can the agronomist drivers for the dairy operations be clarified (outside of over-nutriented fields)?

The interest to source lower cost supply of nutrients or higher quality nutrients at the same or lower cost.

Are there concerns with pollution or farm image in BC, or is all excess volume current hauled away?

To build a digester, a farmer is required to develop and follow a nutrient management plan to address uses of AD digestate on-farm.

What should we assume as the market price for phosphorous or nitrogen?

The cost of nitrogen (purchased as a 40-0-0 product) is typically \$1/lb (if not slightly less). The cost of phosphorous (purchased as phosphate starter) is typically \$1.2/lb (or slightly higher). If you are using a different price, please state your assumptions clearly.

Do you have further information about the host industrial site?

Characteristic	Quantity
Herd Size:	350 milking cows
Off Farm Substrates:	8T FOG; 20T SSO/day
Process Volume:	28T off farm; 40T manure/day
Retention Time:	30 days
Gas Volume:	200m ³ /hr
Electrical Production:	0 kw
Additional Production Information:	
Cake:	20T/day
Tea-water:	30T/day
Bedding:	10T/day