

Atlantic Canada Opportunities Agency
**Hull Design Efficiency
 Challenge**



Applicant’s Guide

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Introduction

Climate change is one of the most important environmental issues of our time. It is caused by the increase in concentrations of greenhouse gases (GHG) in the atmosphere. GHG emissions are often associated with agriculture, automobiles and factories; however, studies suggest that, in 2016, fishing vessels released 207 million tons of carbon dioxide, a number that has quadrupled since 1950. In fact, fuel consumption from fossil fuel engines onboard fishing vessels can account for 60-90% of fisheries life cycle GHG emissions.

Small-scale fishing contributes to about one-fourth of the global GHG from fishing vessels, but the intensity from small operations has shown a dramatic increase over time in comparison to industrial fishing. This increase can be attributed to the widespread adoption of fossil-fuel engines in small vessels in the 1980s. In addition, in order to carry more fishing gear and make fewer trips back to shore, smaller fishing vessels are now heavier and larger than earlier designs – reaching sizes of 45 feet wide and up to 33 feet across. As a result, they use more fuel, which results in more fuel combustion and, thus, contributes to higher GHG emissions from the industry.

In 2011, a study examining fuel use and GHG emissions of world fisheries found that Canadian fisheries made up one per cent of the global fishing catch, and one per cent of global fishing emissions. This makes the Canadian fishing fleet very close to average in terms of emissions per ton of fish or shellfish landed.

Any effort to address sustainable fisheries in Canada must ensure their continued prosperity. In 2018, Canada exported a record \$6.9 billion in fish and seafood products. Approximately 72,000 Canadians make their living directly from fishing and fishing-related activities.

In other industries, regulations are a key component of controlling GHG emissions. Due to a lack of suitable alternatives to diesel engines, a regulatory approach would likely have a negative economic impact on small-scale fishing vessels, and the fishing industry as a whole. As a result, their GHG output is largely unregulated. As such, addressing this issue in Canada requires the development of energy efficient designs to reduce fossil fuel consumption, such as reducing the weight of fishing vessels or utilizing advanced hull design using different materials.

Challenge Statement

The ACOA Hull Design Efficiency Challenge (the Challenge) aims to develop an innovative hull design that meets the needs of the Atlantic inshore fishery, maximizes energy efficiency, lowers operational costs and reduces greenhouse gas emissions.

The Challenge is organized and delivered by the Atlantic Canada Opportunities Agency (ACOA) under its Regional Economic Growth through Innovation (REGI) program.

The Challenge is governed by this Guide. All participating organizations are required to comply with this Guide and all applicable legislation and regulations.

The Challenge is void where prohibited by law or subject to legal restrictions.

Challenge Objective

The objective of the Challenge is to design an innovative fishing boat hull that will:

1. **Lower operational costs** – fishing boats will use less fuel to accomplish the same amount of work, lowering costs and increasing profits.
2. **Maximize energy efficiency** – inshore fishing vessels will be able to do more work using less fuel.
3. **Reduce greenhouse gas emissions** – using less fuel means fisheries activities will generate less greenhouse gases and pollution, contributing to a cleaner, healthier Atlantic Canada for everyone.

Grand Prize

The winner of the Challenge will be eligible to receive \$500,000 in financial assistance from ACOA in the form of a non-repayable contribution to support the further basic research and development of their design through pre-commercialization activities, such as prototype field testing, build of product in its final form, or successful deployment of final form in operation setting. Obtaining the financial assistance is conditional upon the winner entering into a contribution agreement with ACOA.

It should be noted that the eligibility criteria under this Challenge and the REGI program and the terms and conditions of that contribution agreement must be met throughout the duration of the agreement.

The terms and conditions of payment of the contribution will be set out in the contribution agreement.

Timeline

It is anticipated that the Challenge will run for a duration of approximately 12 months, from the official launch to the announcement of the winner.

The following are the Challenge milestones:

Stage	Date	Activity
	July 31, 2019	Challenge launch
1 – Initial Intake	August 31, 2019	Application deadline
	September 2019	ACOA review of applications
	September 2019	Jury assessment of applications
	September 30, 2019	Up to 10 semi-finalists selected
2 – Computer Modeling	October 25, 2019	Deadline for semi-finalists to submit technical plans to facilitate computer simulations.
	November 1, 2019 – December 31, 2019	The semi-finalist designs will undergo computer simulation at the National Research Council's (NRC) Ocean, Coastal and River Engineering Research Centre in St. John's, NL.
	January 2020	Jury to assess results of simulations based on specified criteria.
	January 31, 2020	Up to three finalists announced
3 – Scale Model Testing	February 1, 2020 – June 30, 2020	The finalists' designs will undergo scale model building and testing at the NRC's Ocean, Coastal and River Engineering Research Centre in St. John's, NL. Finalists are required to submit a detailed commercialization plan for their design.
	May 31, 2020	Deadline for commercialization plan submission.
	July 2020	Jury to assess findings of NRC scale model testing and commercialization plans.
	By July 31, 2020	Winner announced

ACOA reserves the right to change any of these above dates at its discretion, and where applicable, ACOA will notify applicants of the date changes and will post them on the Challenge website.

Where dates are given throughout the Challenge as deadlines for submissions by applicants, the time-period for those submissions will close at 11:59 pm (AST) on the specified date, unless otherwise indicated.

Who can apply?

The Challenge is pan-Atlantic (New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland & Labrador) in scope and is open to commercial and non-commercial organizations in Atlantic Canada as listed below:

- Small or medium-sized business or other for-profit organization incorporated in Atlantic Canada;
- Small or medium-sized business or other for-profit organization incorporated under legislation in effect in Canada that is registered to do business in and has its principal place of business in Atlantic Canada;
- Not-for-profit organization incorporated in Atlantic Canada or incorporated under legislation in effect in Canada and has its principal office in Atlantic Canada;
- Indigenous organization or group located in Atlantic Canada; and
- Post-secondary/academic institution located in Atlantic Canada.

An applicant may partner with organizations outside of Atlantic Canada provided the primary applicant meets one of the eligible categories listed above and complies with this Guide.

Applicants must meet one of the categories of eligible applicants listed above in order to apply for the Challenge and be awarded the prize funding, and the winner will need to be able to operate in Atlantic Canada to be eligible for the contribution agreement. The outcomes and results of the contribution funding will need to be of primary benefit to Atlantic Canadians.

Submission Requirements

The following are specific application criteria for Stage 1, and will be assessed using a PASS/FAIL system. Failure to meet any criteria in this section will render your application ineligible for further consideration, and you will not be eligible for the Challenge.

- Hull designs must be for a small fishing vessel under 15m/50ft.
- Submissions must focus on innovations to the hull design while keeping the operation of the topside of the fishing boat largely unchanged, as this exceeds the scope of this Challenge.
- Applicants' hull designs must meet relevant Canadian and provincial regulations for commercial fishing vessels at point of application. Guidance may be provided to applicants, as required.

The Challenge welcomes applicants with early-stage concepts for hull designs. At the Stage 2 assessment of the Challenge, selected applicants will be required to provide a technical plan for their design for simulation at NRC's [Ocean, Coastal and River Engineering Research Centre](#) in St. John's, NL. At the Stage 3 assessment, selected applicants will need to develop test models with NRC for testing at NRC's [Ocean, Coastal and River Engineering Research Centre](#).

The detailed criteria and requirements for Stage 2 and Stage 3 will be provided to the applicants selected for those stages by way of Supplements to the Applicant's Guide. All references to "Applicant's Guide" and "Guide" in this and any related documents means, collectively, this Guide and all official Supplements to the Applicant's Guide that may be issued by ACOA in the course of this Challenge.

Applicants will be required to meet all criteria and requirements applicable to a stage in order to be eligible for that stage. Failing to provide the information required for a future stage, or failing to meet applicable criteria or requirements, will result in the application being rejected for assessment for that stage.

Application Form: Section by section description

The Application Form will be made available and can be submitted via the Impact Canada Challenge Platform. More information on the tool used is available on the Application Form.

Applicants must provide

- Contact information of the applicant;
- Business Identification number where applicable;
- List of partners, where applicable.

Applicants must demonstrate their eligibility by indicating how they are an eligible applicant and how they meet the Submission Requirements above, and must provide supporting documents as required.

It is the applicant's sole responsibility to provide information and documents that are sufficiently detailed and legible to support the application and enable ACOA and the Challenge jury to evaluate it against eligibility and evaluation criteria.

Applicants not meeting the Challenge's eligibility criteria or from which the information or documents are missing, insufficient, incomplete or were not received by ACOA within the allocated time period will be rejected at the sole discretion of ACOA. An application may also be rejected if ACOA determines, at its sole discretion, that the application or project does not comply with the terms and conditions of this Guide.

Original, supporting and/or additional documentation may be requested by ACOA at any time during the Challenge.

The applicant's eligibility and completeness of the application will be determined by ACOA.

Section 1: Project Name or Title

Please include your official project name or title. This name or title may be used to promote your application publicly.

Section 2: General Description of the Proposed Design

Challenge Statement: *The ACOA Hull Design Efficiency Challenge aims to develop an innovative hull design that meets the needs of the Atlantic inshore fishery, maximizes energy efficiency, lowers operational costs and reduces greenhouse gas emissions.*

In this section, you are asked to clearly describe how your proposed design will address the Challenge Statement. This information will be assessed by the Challenge jury as part of the review process. Note

that this description could also be used to share and promote your application, should you be chosen as a semi-finalist.

Section 3: Technical Information and Design Drawings

This section will require you to include any and all technical background or design information on your proposed design. This information will be assessed by the jury as part of the review process.

Please provide all necessary technical background information to support the design and implementation of the innovation on the vessel. Ensure to include preliminary design drawings for the hull form and a general arrangement of the vessel, ensuring that the innovation is clearly identified on the drawings to allow the jury to evaluate the design.

Assessment Criteria

Each of the numbered criterion below will be evaluated and scored using a scale of 1 to 5:

Criterion 1: Increase in hull efficiency as measured by the power required to move a hull at a given speed with a given engine.

Stage	Information required by Innovator
1	Online application.
2	Submission of technical plan and digital design files (e.g. .iges, .stp files). Note: Applicants who cannot develop their hull design to a 3D computer modeling design state (e.g. by providing an .iges or .stp file) will no longer be eligible for the Challenge.
3	NRC will produce scaled self-propulsion boat hull models for each of the three finalists with a stock propeller provided by NRC. Applicants' designs will be towed and evaluated in the Ocean, Coastal and River Engineering Research Centre tank and the results compared between entries.

Criterion 2: Operational suitability for the Atlantic Canadian inshore fishing industry, considering:

- **Safety Standards** (Transport Canada Small Fishing Vessel Safety Regulations available [here](#).)
- **Appropriateness for operational environment** (fishing harbours, Atlantic Canadian sea state, etc.)

Stage	Information required by Innovator
1	Online application.
2	Scores from Stage 1 will be carried forward.
3	Scores from Stage 1 will be carried forward.

Criterion 3: Affordability

Stage	Information required by Innovator
1	Online application.
2	More information on estimated unit production costs and selling price may be requested.
3	More information on estimated unit production costs and selling price may be requested.

Criterion 4: Feasibility of Commercialization Plan, considering:

- Sustainability of commercial model
- Achievable timeline

Stage	Information required by Innovator
1	Online application.
2	Provide an updated "Go to market plan" and timeline for commercialization.
3	Provide a detailed commercialization plan for implementing the hull design into a working-vessel design.

Jury and Selection Process

All applications will be assessed by a jury, who will make recommendations to ACOA for the selection of the semi-finalists, finalists and the winner. The jury will be comprised of both members of the public (private sector, stakeholder groups) and of the Government of Canada, including the NRC and ACOA. The jury will apply the assessment criteria for each stage of the Challenge in order to:

- In Stage 1, review the initial applications and make recommendations to ACOA for the selection of up to 10 semi-finalists;
- In Stage 2, review the findings of the NRC computer modeling and make recommendations to ACOA for the selection of up to three finalists; and
- In Stage 3, review the commercialization plan submitted by the finalists and the findings of the NRC scale model and make recommendations to ACOA for the selection of the recipient of the prize.

Further to the jury's recommendations, ACOA will select and announce the semi-finalists, finalists and winner as applicable to each stage of the Challenge. All of ACOA's decisions and selections will be final and not subject to appeal.



Privacy

The collection, use and disclosure of the information and data collected in the context of the Challenge will apply in accordance with the *Privacy Act* and the *Access to Information Act*.

All information collected in the context of the Challenge is collected under the *Atlantic Canada Opportunities Agency Act* and the *Financial Administration Act*.

All information submitted for the Challenge, including the information submitted in this Form and via the Impact Canada Challenge Platform, is submitted and collected for ACOA's use and disclosure as set out herein.

Information collected in the Applicant Form and throughout all stages of the Challenge will be used to:

- Assess the applications for each stage of the Challenge, as applicable;
- Make recommendations for and select the semi-finalists, finalists and winner, as applicable;
- Promote the semi-finalists, finalists and winner, as applicable; and
- Evaluate the impact of the Challenge.

By applying for the Challenge, the applicant and its shareholders and members, as applicable, agree to ACOA using and disclosing the information provided in their application package, and in all stages of the Challenge, with the jury members and any federal agency or department (such as the National Research Council Canada, Innovation, Science and Economic Development Canada and the Privy Council Office) for the following purposes:

- Administrating and evaluating the application at each stage of the Challenge;
- Reviewing eligibility at each stage of the Challenge, as applicable;
- Evaluating the Challenge, including statistics and reporting; and
- Evaluating the funding program.

ACOA may ask for certain personal information about individuals associated with the applicant, such as shareholders, members, directors and employees, as applicable, to be able to determine eligibility and to assess the quality of the organization's application at various stages of the Challenge. Individuals are free to decide whether to provide that information. However, failure to provide required information will result in the application being rejected.

Costs and Expenses

Applicants are not required to make a purchase or pay a fee to participate in or win the Challenge. However, applicants are fully responsible for all expenses incurred in connection with their participation in the Challenge, including the submission of their application and participating in further stages, as applicable.

The National Research Council services and facilities utilized to support the Stage 2 computer modeling and the Stage 3 scale model building and testing will be at no cost to the selected applicants. However, selected applicants will remain fully responsible for all expenses incurred and resources expended in connection with preparing for, attending and participating in the said simulation and scale

model building and testing, as the case may be, and for costs of any services that may exceed the scope of the Challenge.

General conditions

When applying, in addition of the consents and authorizations contained in the Application Form, applicants agree and certify:

- that they will comply with all applicable legislation and regulations as well as this Guide, as defined herein;
- that the information, statements and consents provided and all documents submitted are complete, true and accurate, including the Application Form;
- that, in the event of a discrepancy or contradiction, this Guide takes precedence over all other documents pertaining to the Challenge;
- that ACOA may, at any time and at its sole discretion, cancel, modify, extend or suspend the Challenge. In such a case, no liability shall be incurred by ACOA or by the members of the jury;
- that ACOA may, at any time and at its sole discretion, reject any application that fails to comply with this Guide, attempts to register for the Challenge in any manner or by any means other than those described in this Guide, attempts to disrupt the Challenge or circumvent any rule in this Guide;
- that ACOA and the members of the jury cannot be held responsible for any rejected, lost, delayed, illegible, damaged or undeliverable applications or any delay or problem in the sending, processing, receiving or review of applications at any stage of the Challenge;
- that, if applicable, the applicant owns the intellectual property rights or is authorized to use them in connection with its project and the content presented in the application; and
- that ACOA may, at any time, require the applicant and its shareholders or members, as applicable, to provide it with any original document or additional information for the purpose of verifying the application or other information submitted or representation made in the course of the Challenge.

Release, liability and compensation

The applicant agrees to hold harmless and discharge ACOA, the members of the jury and other federal departments or agencies from any and all liability for claims, losses, damages or expenses arising from its project and/or participation in the Challenge, as well as personal injury or death, loss or damage to property, or allegedly caused by the applicant, its shareholders, members, directors, officers, employees, contractors or volunteers, as applicable, when carrying out its project or during the course of its participation in the Challenge.

ACOA, the members of the jury and other federal departments or agencies will not be liable to the applicant, its shareholders, members, directors, officers, employees, contractors or volunteers, as applicable, for any third party claims, lawsuits, demands or actions.

Legislation

This Guide shall be governed and interpreted in accordance with the laws of Nova Scotia and the applicable federal laws.

Severability of Paragraphs

If a paragraph in the Guide is declared or deemed illegal, unenforceable or null by a court of competent jurisdiction, then that paragraph will be considered null and void. However all other paragraphs that are not affected will remain applicable within the limits of the law.

Official Languages

French and English are the official languages of Canada. The Government of Canada is committed to supporting the vitality and development of the English and French language minorities in Canada and encouraging full recognition of the use of French and English in Canadian society. Companies can apply and require that they be contacted and served in the official language of their choice.

Contact

Send us your questions at: acoa.cleantechimpact-impacttechpropre.apeca@canada.ca. We will get back to you within two business days.