Request for Proposals

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Socioeconomic impacts of hydrogen production in Nova Scotia

RFP Release Date: September 16, 2022

Proposal Due Date: October 14, 2022

Contact:
Sven Scholtysik, Research Manager
sscholtysik@netzeroatlantic.ca

1. Introduction

Net Zero Atlantic is a leading energy research organization advancing Atlantic Canada's transition to a low-carbon future. We are encouraging growth of a sustainable energy sector by leading applied research in critical topics, including hydrogen, offshore wind, geothermal energy, tidal energy, and energy system modeling. Our focus is on advancing research that will help decarbonize our region's economy, mitigate climate change impacts, and move Atlantic Canada toward net-zero emissions by 2050. As a member of the 50-30 Challenge, we are committed to increasing workforce diversity in the energy sector.

2. Context

Under the Sustainable Development Goals Act, Nova Scotia has legislated a net-zero greenhouse gas (GHG) emission economy by 2050. Reaching these GHG emission reduction targets necessitates the decarbonization of all economic sectors. While traditional decarbonization strategies (e.g., decarbonizing electricity generation and the subsequent electrification of end-uses) will help reduce GHG emissions, they will not be sufficient to reach our deep decarbonization goals.

Parts of the economy are inherently difficult to electrify, and a widespread integration of variable renewables (i.e., wind and solar) must be managed closely to avoid grid instability and other intermittency issues. One strategy that could help meet our clean energy goals and could diversify the economic base in Atlantic Canada, is the adoption of low-carbon fuels – with hydrogen being one of the most promising options.

Studies facilitated by Net Zero Atlantic found that hydrogen and hydrogen-derived fuels can play an important role in domestic decarbonization and offers a significant export opportunity for the region. One hydrogen-derived fuel, ammonia, has been at the center of the international discussion around potential decarbonization options for, among other things, marine transportation.

In the Maritimes, hydrogen has the potential to deliver up to 22% of the end-use energy demand by 2050 and mitigate 21% of the region's GHG emissions. In addition, hydrogen has the potential to put Nova Scotia back on the map as an energy exporter.

The provincial government is interested in deepening its understanding of the economic impact that a large-scale hydrogen production facility would bring to the province. Net Zero Atlantic, on behalf of the Nova Scotia Department of Natural Resources and Renewables, is therefore requesting an investigation of the socioeconomic impacts that a large-scale hydrogen facility would entail. For the purposes of this study, a "large-scale hydrogen facility" would include hydrogen production, the process of converting hydrogen to ammonia and storage/transport prior to shipping for global markets. More specifically, the report should focus on infrastructure and services necessary and determine the socioeconomic impacts of both the construction and operational phases of such a project.

The Province of Nova Scotia understands that the benefits of hydrogen development will not be realized without the right number of workers, with the right skills, in the right places, and at the right time to enable its growth. It is further understood that some project information may need to be updated during the project lifecycle, including the timing, location and size of temporary workforces and the inter-relationship between other activities in the area.

The resulting report will be a reference document for program and project-related decision making and will support the objectives of the Sustainable Goals Development Act while continuing to advance Nova Scotia's economic, social, and environmental well-being.

3. Objective

The objective of this RFP is to obtain the services of a consultant (the Respondent) to prepare a report that provides the provincial government with information necessary to deepen its understanding of the socioecnomic impacts of hydrogen production in Nova Scotia.

4. Scope of Work

The scope of work consists of three primary tasks:

Task 1: Information Review and Data Gathering

Task 2: Assessment and Analysis

Task 3: Reporting

The final deliverable must cover the following topics, although the report structure can be defined by the Respondent.

1. Project Design

   The Respondent is requested to develop and define generic but realistic project development assumptions and provide a detailed overview of a greenfield hydrogen production facility that includes hydrogen/ammonia conversion, storage/bunkering and construction of a marine fuelling jetty, as well as transport infrastructure to the fuelling jetty. The overview should provide details on the design, permitting, construction and operational phases of the facility and list typical project timelines, costs and risks.

   The Respondent can assume a minimum capacity of 500 MW to be constructed in the project's first phase, with the potential to expand the capacity in future project phases. Furthermore, the Respondent can assume a coastal location and that the hydrogen production facility will use electrolysis to produce hydrogen from water and low-carbon electricity.

   Analyzing the construction and operation of the electricity generation facility is out of scope for this report. However, the respondent is expected to comment on the electricity-related infrastructure that is needed to generate sufficient electricity and transport it to the project site project. This should include a discussion of suitable electricity generation options that exist in on- and offshore Nova Scotia.

2. Economic Impacts

   The report should analyze and comment on the economic effects (e.g., creation of employment opportunities) that arise during the design/permitting, construction and operational phases of a typical hydrogen production project. An economic analysis should be accompanied by economic modelling that allows for the identification of inter-sectoral relationships and growth opportunities for local

businesses. This section should also provide commentary around how local hydrogen production could facilitate future domestic hydrogen use in support of Nova Scotia's decarbonizations targets.

3. Trades & Skills

   It is important to the Nova Scotia Department of Natural Resources and Renewables to understand what trades and skills are needed to satisfy the labour, service and material demands of this facility. The report should therefore provide an overview of the skills and trades that are needed in this context. The respondent is expected to draw from their own analysis as well as from experiences in other jurisdictions and other sectors.

4. Social Impacts

   The report should analyze the social impacts of a hydrogen production facility. This section should comment on expected impacts on housing availability and affordability, necessary health care infrastructure and services, emergency response and protection services and any other community infrastructure and services that are necessary for the successful and safe construction and operation of a hydrogen production facility.

5. Lessons Learned

   The report should provide an overview of lessons learned from other hydrogen production projects and comment on the applicability of these lessons in a Nova Scotian context. This section should also comment on typically encountered project risks and their potential impact on project cost and scheduling.

In summary, this report will provide a broad understanding of the socioecnomic impacts of large-scale green hydrogen/ammonia production would have in Nova Scotia. The outputs of this report are expected to be detailed enough to be used in the provincial Input-Output Model. Details on the provincial I-O model can be found here.

5. Deliverables

Upon project completion, the Respondent will provide:

(1) A report that presents the findings of Tasks 1 and 2. Both a draft version and final version are required, with the opportunity for the project management committee to recommend reasonable changes to the draft version for inclusion by the Respondent in the final version before the project ends.

(2) Presentations (in PowerPoint) to the project management committee to accompany submission of the draft and final versions of the report. The presentations will review the project and its main findings.

6. Timelines

The Respondent is expected to host regular project status meetings via video conference. Net Zero Atlantic will host the kickoff meeting. The following timeline outlines Net Zero Atlantic's expectations with respect to timing.

RFP release date:	September 16, 2022
Proposal due date:	October 14, 2022 (5 pm ADT)
Project kickoff:	Week of November 7, 2022
Draft report:	January 31, 2023 (latest)
Final report:	March 31, 2023 (latest)

7. Funding

Funding available for this project is capped at a maximum of CAN $150,000 including taxes. Proposals that exceed this amount will not be considered. Note that proposals will be rated first in terms of experience/team/work plan and second in terms of value. Please include a cost-task breakdown (time per person per task) showing hourly or daily rates.

Please note that Net Zero Atlantic reserves the right not to proceed with project award.

8. Respondent Qualifications

The successful applicant must demonstrate knowledge of and experience with socioecnomic analyses, particularly regarding impacts of large-scale energy projects. In addition, the successful applicant must demonstrate knowledge of hydrogen production projects and the Nova Scotian energy supply chain. Proposals should explain the experience and qualifications of the project team and provide references where available (both literature and previous clients).

Proposal Requirements

- The proposal should be concisely worded with clearly described objectives, methods, budget, schedule, and deliverables. Maximum 15 pages excluding appendices, title page, and cover letter. Please assemble all components into a single PDF document.
- The proposal should include a description of the Respondent's organization and its relevant experience with similar projects. The Respondent must also describe the relevant work experience of the key staff assigned to this project and their roles on the project. This material should be summarized in the body of the RFP and can be presented in more detail, if needed, in the appendix.
- Please provide a project organizational chart showing the role and reporting hierarchy of project partners, and reporting lines to the Net Zero Atlantic project management committee.
- A single electronic document is sufficient. Please ensure the proposal or cover letter is signed by an officer or equivalent with authority to bind the Respondent to the statements made in the proposal.
- The electronic copy should be uploaded in PDF format to the Net Zero Atlantic-FTP site available at https://oera.sharefile.com/r-rfc9e39db2a3648d8ae21879ed7bd3386. The file name should include an abbreviated form of the Respondent's name.

9. Questions and Clarifications

Net Zero Atlantic will accept content-related questions from interested applicants on an ongoing basis until September 30, 2022. A Q&A page will be available on the Net Zero Atlantic website https://netzeroatlantic.ca/opportunities/request-proposals/socioeconomic-impacts-hydrogen-production-nova-scotia. The names and organizations of those submitting questions will remain anonymous; only the question and Net Zero Atlantic's response will be posted. Interested parties are encouraged to check the Q&A page for updated information and/or clarifications that may help in completing their proposal. The Q&A page will only be available if content-related questions have been received.

10. Evaluation

This project will be administered through Net Zero Atlantic. As shown below, proposals will be quantitatively evaluated against a set of criteria.

Factor	**Weight**
Experience and Knowledge: Qualifications, experience and capabilities of the company and delivery team; demonstration of knowledge relevant to this study.	30%
Project Plan, Approach and Methodology: Respondent demonstrates an understanding of the project service requirements and has outlined a clear and effective work plan. Proposal describes the objectives, methodology, milestones and deliverables, and a sound approach in undertaking this project. Communication format and frequency between the Respondent and Net Zero Atlantic are clearly described. Respondent describes an achievable schedule and demonstrates the ability to complete the work on or before the desired completion date.	30%

Proposal Presentation and Organization: The proposal includes all RFP requirements, demonstrates attention to clarity, grammar, presentation, and comprehensibility.	20%
Value: The project will offer good value for the proposed budget. The budget is clear, convincing, and well-described.	20%
Total:	100%