Dual FEED Services for LOHC Facilities

REQUEST FOR PROPOSAL (RFP)

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Acronyms

Acronym	Definition
BFD	Block Flow Diagram
BL	Battery Limits
BOE	Basis of Estimate
BoP	Balance of Plant
CAPEX	Capital Expenditure
EPC	Engineering, Procurement, Construction
EPF	Engineering, Procurement, Fabrication
ESG	Environmental, Social, Governance
FEED	Front End Engineering Design
HAZID	Hazard Identification
HAZOP	Hazard and Operability Study
HGP	Hydrogen Generation Plant
HSSE	Health, Safety, Security, and Environment
IP	Intellectual Property
ISBL	Inside Battery Limits
kTPA	Kilo Tonnes Per Annum
LOHC	Liquid Organic Hydrogen Carrier
MCH	Methylcyclohexane
NARC	North Atlantic Refining Corp.
NL	Newfoundland and Labrador
OSBL	Outside Battery Limits
PDP	Process Design Package
PEM	Proton Exchange Membrane
P&ID	Piping and Instrumentation Diagram
PFD	Process Flow Diagram
QA/QC	Quality Assurance and Quality Control
RFP	Request for Proposal
SIS	Safety Instrumentation System

1 Introduction

1.1 Project Overview

North Atlantic Refining Corp. (“NARC” or North Atlantic) is developing an integrated wind-to-hydrogen-to-LOHC export system centred on the Come By Chance refinery site in Newfoundland and Labrador, with dehydrogenation facilities in Europe. The Project will produce low-carbon hydrogen using wind generation and associated grid interconnections, convert that hydrogen into methylcyclohexane (MCH) using toluene as a Liquid Organic Hydrogen Carrier (LOHC), and export MCH via existing marine terminal infrastructure to European receiving terminals for dehydrogenation and injection into regional hydrogen networks.

Figure 1-1: North Atlantic Wind to Hydrogen Project Layout Come By Chance, NL

The Project is split into four main areas:

- Wind Farm, Transmission Lines and 35 /138 KV Substation at wind side and 138/35 KV substation on Hydrogen side.

- Hydrogen Generation Plant (HGP) and 480 V Unit Sub-Substation
- Liquid Organic Hydrogen Carrier Plant – Hydrogenation at Come by Chance, NL area.
- Liquid Organic Hydrogen Carrier Plant – Dehydrogenation at user location in Europe.

The wind farm consists of approximately 45–50 utility-scale turbines, each rated about 7 MW, providing an installed capacity of roughly 320 MW for annual hydrogen production of 30 kTPA. The site includes about 60 km of access roads and a 34.5 kV collector system, designed using regional wind and topographic data. Foundations are engineered to support large-capacity tower cranes for turbine assembly and maintenance.

A 138 kV transmission line, approximately 25 km in length, connects the wind farm to HGP and Hydrogenation Plant under a behind-the-meter configuration. Supplemental grid supply from the Sunnyside substation provides additional reliability for hydrogen production and hydrogenation operations.

The HGP will comprise of modular PEM (Proton Exchange Membrane) electrolyzer units, organized into multiple arrays totaling about 240 MW of electrolysis capacity for annual hydrogen production of 30 kTPA. Each array includes several electrolyzer cabinets integrated with rectifiers, transformers, and process auxiliaries.

The LOHC plants will employ a toluene–MCH carrier system using licensed commercial technology. Existing hydrocarbon storage tanks, pipelines, and jetty facilities at the North Atlantic Terminal will be repurposed for LOHC handling. The hydrogen-laden LOHC will be shipped to a dehydrogenation facility in Wilhelmshaven, Germany, or site in Antwerp, Belgium where hydrogen will be released and injected into the European hydrogen pipeline network for final delivery to offtakes.

1.2 Purpose of Request for Proposal

The Owner (North Atlantic) is soliciting proposals for a Dual Front-End Engineering Design (FEED) for a new LOHC based hydrogen storage facility. This facility will consist of two primary process plants: a **hydrogenation plant** that chemically binds hydrogen to a liquid organic carrier, and a **dehydrogenation plant** that releases hydrogen from the carrier.

The purpose of this Request for Proposals (RFP) is to engage two qualified engineering contractors to perform parallel Inside Battery Limit (ISBL) Front-End Engineering Design (FEED) studies for the LOHC hydrogenation facilities at Come By Chance and the dehydrogenation facilities at [redacted] (collectively, the “Project Facilities”). Each

FEED contractor is expected to deliver a complete, end-to-end FEED package and associated cost estimate and execution plan for the full LOHC chain within the defined battery limits.

This RFP outlines the project scope, requirements, and the terms under which the proposals are solicited and provides the information necessary for bidders to prepare and submit comprehensive proposals that address the technical and commercial requirements for the FEED services.

Following completion of the parallel FEEDs, North Atlantic will evaluate the deliverables and outcomes from both contractors and intends to down-select one contractor as preferred party to support implementation, which may include Engineering, Procurement and Construction (EPC) / Engineering, Procurement and Fabrication (EPF) services, subject to performance, negotiations, and internal approvals.

Unless otherwise agreed in writing, partial proposals (e.g., hydrogenation-only or dehydrogenation-only scopes) will not be generally considered. Bidders shall assume responsibility for all scope elements described herein and in the RFP attachments. However, North Atlantic keeps its right to entertain the partial proposals for hydrogenation only or dehydrogenation only scopes if it adds value to the overall project.

All information provided in proposals shall be non-proprietary and free of any company-specific branding or references. Bidders are expected to use globally accepted standards and terminology in their submissions. Any assumptions or exceptions should be clearly stated. North Atlantic reserves the right to award contracts to two bidders, to negotiate scope and terms, or to make no award as a result of this solicitation. By participating in this RFP, bidders acknowledge and agree to abide by the terms and conditions outlined herein.

1.3 Scope Boundaries and External Interfaces

The wind farm, regional transmission infrastructure, grid connection, and HGP works are being developed under separate contracts and are not part of this FEED scope. The FEED contractor shall treat these facilities as external interfaces and shall adopt the design basis, operating envelopes, and interface data provided in Attachment 1 and subsequent North Atlantic communications.

Similarly, at [redacted] the LOHC process units will be hosted within existing terminal facilities. The FEED contractor shall treat host utilities, infrastructure, and marine facilities as external interfaces, and shall design the dehydrogenation

units and associated systems to integrate with those host facilities in accordance with the interface information provided by North Atlantic.

2 Scope of Services

The scope of work for the Dual FEED encompasses development of all activities required to deliver comprehensive front-end engineering designs for the ISBL portion of LOHC facility, covering both the hydrogenation and dehydrogenation process units and all supporting systems inside each unit. The FEED shall be developed to a level suitable for investment decision support and subsequent EPC tendering and execution.

2.1 Hydrogenation Unit

The bids should include two options for scope of Hydrogenation is as follows:

1. Initially sized for an annual hydrogenation capacity of 30 kTPA hydrogen; and is fully future-proofed and plot-protected to enable a subsequent expansion to 60 kTPA within the same overall plot and battery limits, through defined pre-investments (e.g., oversized foundations and pipe racks, space reservations, tie-in points, and oversizing of selected equipment where technically and economically justified).

   Thus, the contractor shall provide:

   - A fully defined 30 kTPA FEED case, including process design, equipment specifications, layouts, utility loads, HSSE studies and a Class 3 cost estimate; and
   - A corresponding 60 kTPA FEED / CAPEX case, clearly identifying incremental scope, equipment, construction works and costs required to expand from 30 kTPA to 60 kTPA.
2. Second option shall be for the total annual production capacity of 60 kTPA case including process design, equipment specifications, layouts, utility loads, Health, Safety, Security, and Environment (HSSE) studies and a Class 3 cost estimate

The location for both the options is Come-By-Chance, NL, Canada adjacent to existing Braya Refinery and corresponding North Atlantic Terminal.

North Atlantic will try and eliminate one of the options during the bidding phase and only one option will be selected for performing the FEED.

2.2 Dehydrogenation Unit

The FEED contractor shall develop two options for Dehydrogenation as follows:

- Process Design Package for 30 kTPA capacity at [redacted] location.
- Process Design package for 60 kTPA capacity at [redacted] location.

The contractor shall include process design basis, functional descriptions, standard design data and proprietary equipment specifications as a minimum in Process Design Package ("PDP") for each facility. Contractor shall also provide a plan to quickly move from PDP to FEED development so that overall project schedule can be maintained. **Only one of the two options will be progressed further into FEED development.**

Each selected FEED contractor will be responsible for performing, at a minimum, the following scope elements for the FEED package:

- **Process Design:** Develop the process design for the hydrogenation and dehydrogenation units using the bidder's proprietary LOHC technology. This includes establishing the design basis (feedstock and product specifications, capacities, conversion rates), preparing process flow diagrams (PFDs), heat and material balances, and detailed process descriptions for how hydrogen will be absorbed and released by the LOHC.
    - **Equipment and Facilities Engineering:** Perform preliminary design and specification of all major equipment and systems. This covers reactors, heat exchangers, distillation columns, drums, vessels, pumps, compressors and any specialty equipment, hydrogen and toluene purification systems, and any other critical equipment in both units. Contractors shall size and specify equipment based on their technology, and provide general arrangement drawings, equipment datasheets, and layouts for the process units.
        - **Integration and Utilities:** Design the integration of hydrogenation and dehydrogenation units with common facilities available at respective sites. This includes all required utility systems (electric power, cooling, heating, inert gas, etc.), controls and instrumentation, safety systems (fire and gas detection, emergency shutdown systems), and any required infrastructure (such as storage

for hydrogen-rich and hydrogen-lean carrier, loading/unloading facilities as applicable). The FEED shall ensure that the two process units are properly interfaced and that the overall facility operates safely and efficiently as a single system at each location.

- **Safety, Health, and Environment:** Incorporate best-practice safety and environmental design principles. Conduct preliminary hazard identification and operability studies (HAZID/HAZOP) during the FEED to ensure the design meets all safety requirements. Consider environmental controls for emissions, effluents, and waste associated with the LOHC processes (for example, any vented gases or spent catalysts) in compliance with relevant regulations and standards.
- **Project Deliverables Preparation:** Prepare all required FEED deliverables (as detailed in Section 4) including engineering documents, drawings, specifications, and reports. The FEED packages developed by each contractor should be sufficient in detail and quality to enable North Atlantic to confidently assess the feasibility, obtain accurate cost estimates, and proceed to EPF roll over or EPC bidding and execution after FEED.
- **Coordination and Reviews:** Coordinate with North Atlantic's project team for data exchange, design reviews, and interface management. The contractors will participate in periodic progress reviews and a final FEED review with North Atlantic. Each contractor is expected to proactively identify any scope ambiguities or required project decisions and engage with North Atlantic to resolve them during the FEED phase.
- **Schedule and Reporting:** Develop and adhere to a FEED schedule that meets North Atlantic's overall project timeline objectives. Provide regular progress reports to the North Atlantic, highlighting accomplishments, upcoming work, and any issues or risks that need attention. Maintain quality management throughout the FEED in line with the contractor's QA/QC procedures and North Atlantic's expectations.

Each FEED contractor's scope for FEED phase concludes with the handover of a complete FEED package and associated documentation as per Section 4 (Technical Deliverables). North Atlantic expects that the scope will be executed in accordance with international engineering standards and that the deliverables will reflect a high-quality, thoroughly vetted design ready for advancement to the implementation stage.

2.3 ISBL Scope Definition

In order to maintain consistency between the bidders, a general definition of scope for ISBL FEED Contractor is provided below with the basic assumption that ISBL FEED contractor will assume all the above ground ISBL scope and provide required interface information to Balance of Plant (BoP) and Outside Battery Limit (OSBL) FEED contractor:

- Process units and piping within unit battery limits
- Unit utility systems
- In-unit LOHC storage (if applicable)
- ISBL relief and vent systems, above ground drains to battery limits (BLs) or up to underground tie-in points. Flare system is outside the scope.
- All electrical / instrumentation and control systems up to junction boxes, MCCs or substations as applicable.

See Figure 2-1 and 2-2 for high level Block Flow Diagrams (BFD) outlining the RFP boundaries for both the Come By Chance and European Facilities.

Contractors shall produce an Interface Register covering all external interfaces (wind farm, grid, terminals, marine loading, hydrogen network) for piping, electrical, instrumentation and civil engineering.

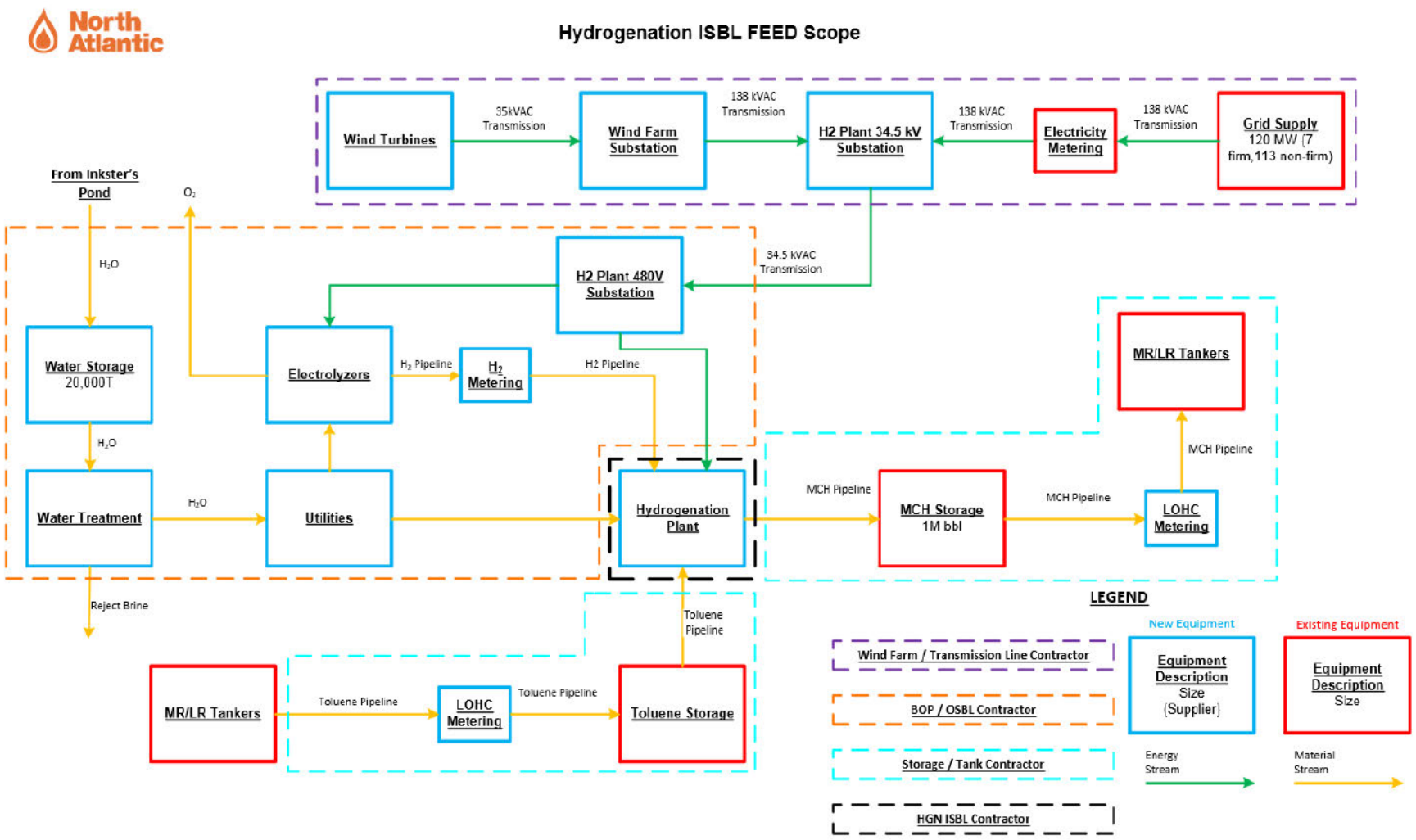

Figure 2-1: Hydrogenation ISBL FEED Scope BFD (Come By Chance)

Dehydrogenation ISBL FEED Scope

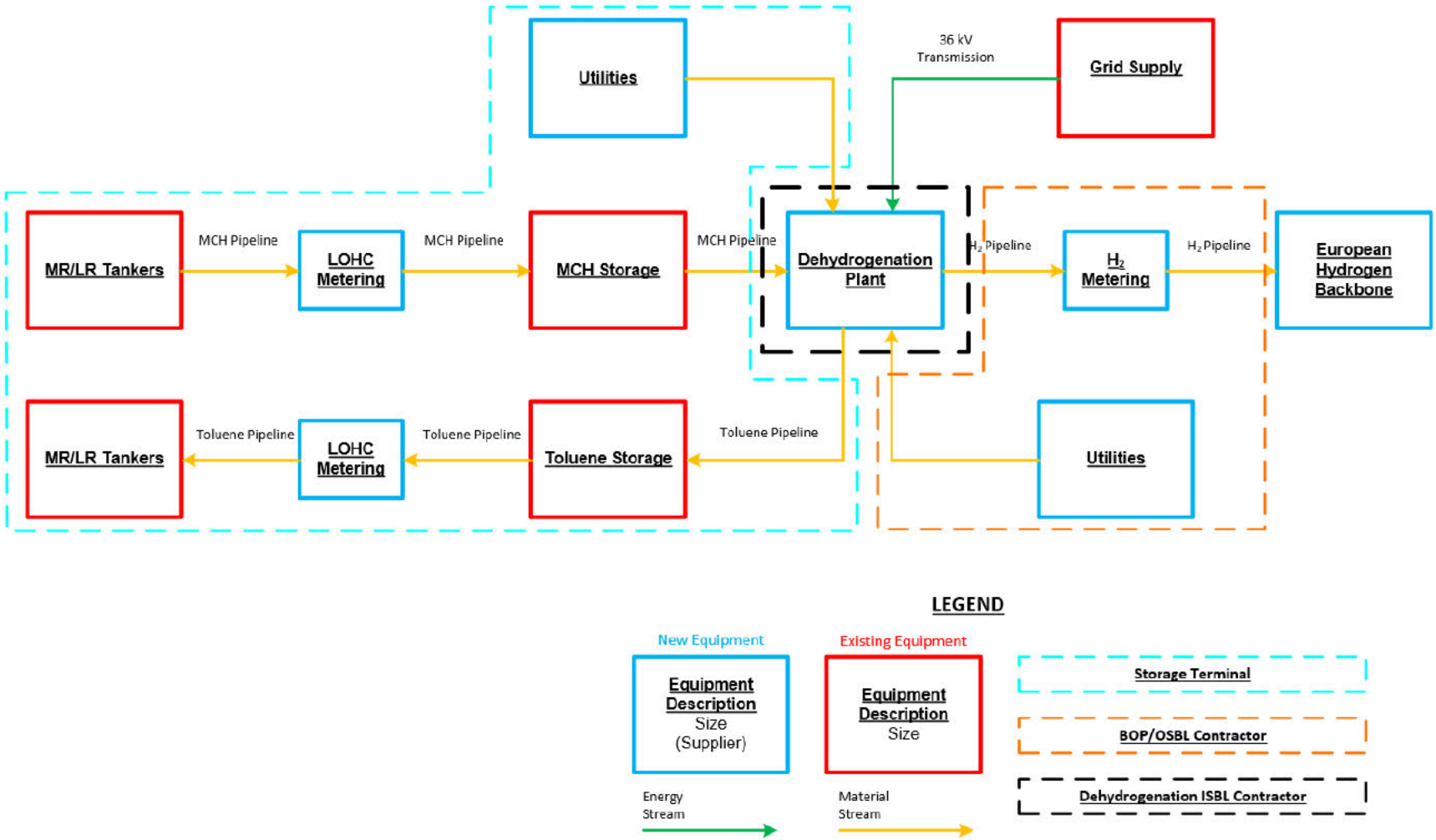

Figure 2-2: Dehydrogenation ISBL FEED Scope BFD (Europe)

2.4 Permitting and Environmental Support

North Atlantic will lead permitting process; however, the FEED contractor shall provide technical inputs including but not limited to:

- Emissions inventories
- Technical process descriptions
- Plot plans and key drawings
- Environmental and safety study inputs

3 Proposal Submission Requirements

Bidders shall prepare a clear and comprehensive proposal in response to this RFP. The proposal must be organized into two parts – a Technical Proposal and a Commercial Proposal – and should address all requirements outlined below. All proposals must be written in English with a professional and concise style, free of marketing fluff and extraneous information.

3.1 Technical Proposal

The Technical Proposal should detail the bidder's approach, capability, and technical solution for executing the FEED. It should include:

- **Introduction and Understanding:** A brief executive summary of the proposal, outlining the bidder's understanding of the project and the RFP objectives. Highlight any unique aspects of the proposed approach or technology.
- **Bidder Experience and Qualifications:** An overview of the bidder's relevant experience, particularly in LOHC technology or similar hydrogen-related projects. Include a summary of past projects or case studies (without referencing specific client names or locations) that demonstrate the bidder's capability to deliver FEED and subsequent project phases in EPF modular concept for comparable process facilities. Emphasize any successful hydrogenation/dehydrogenation plant designs or hydrogen infrastructure projects completed by the bidder. Also, contractor shall include an organization chart showing execution model with resource allocation and CVs of key project personnel.
- **Technology Description:** A description of the LOHC technology the bidder will utilize. Explain the chemistry and process for hydrogenation and dehydrogenation, the carrier medium involved (without using proprietary trade names if possible), and the performance characteristics (e.g. hydrogen storage capacity per cycle, expected efficiency, operating

conditions like temperature/pressure). Confirm the technology's readiness level and any industrial references (again, without disclosing proprietary names).

- **Scope Execution Plan:** A detailed plan for how the bidder will execute the FEED scope of work. This should include the proposed project organization and team structure (identifying key personnel and their roles/qualifications), the design methodology, and how the bidder will manage interface between hydrogenation and dehydrogenation design, as well as interface with North Atlantic. Provide a preliminary project schedule for the FEED activities, showing key milestones, deliverables, and reviews. Describe type of digital tools or software and data environment to be used (e.g. process simulation software, P&ID drafting, 3D modeling, etc.).
- **Deliverables and Quality Assurance:** Confirm understanding of the required FEED deliverables (Section 4) and describe the bidder's internal quality assurance process to ensure deliverables are completed to a high standard. If the bidder has standard deliverable lists or templates, the proposal may reference them (to be provided in the appendix of the proposal if needed). Discuss how the bidder will incorporate safety and regulatory compliance in the design process.
- **Risk Management:** Identify any major risks or challenges foreseen in this FEED or the subsequent project execution (for example, scale-up of new technology, supply chain for key equipment, etc.) and describe strategies to mitigate them. Explain how the bidder's dual FEED involvement will be managed to protect the confidentiality of its proposal and design vis-à-vis any parallel competitor efforts (North Atlantic will also manage information separation).
- **Interface Management**: Each contractor will develop a framework for an interface management plan to interchange required project data between various other FEED contractors on timely basis and create various interface tables such as battery limit tables, civil loads, utility summaries, electrical loads, emissions summary and relief load summary necessary to maintain the overall project schedule.

  The plan shall also contain the interface or coordination with the owner team on regular basis as well as request for information required from North Atlantic to carry out FEED scope.

- **Execution to EPC Transition:** Although the RFP is for FEED services, briefly describe how the bidder envisions the transition from FEED to EPF phase. Outline any continuity

plan or advantages the bidder's organization offers for moving into the EPF phase (such as having module construction management capability, established procurement networks for equipment, etc.). This section helps demonstrate the bidder's ability to support the project beyond FEED.

- **Assumptions, Clarifications and Deviations** – Contractor shall provide complete list of all the Assumptions, Clarifications, and Deviations to the RFP explaining the reasons with any benefits to the project.

The Technical Proposal should be structured and paginated clearly, with a table of contents and section headings corresponding to the points above. All pages should be numbered. Any confidential or proprietary content in the proposal should be minimized and, if necessary, clearly marked.

3.2 Commercial Proposal

The Commercial Proposal must contain all relevant financial and commercial information. It should include:

- **FEED Pricing:** A lump-sum price (or other agreed pricing structure, if requested by North Atlantic for execution of the complete FEED scope of work as defined in this RFP. The price should be inclusive of all labor, subcontracts, licenses, software, travel, overheads, and profit. Provide a breakdown of the lump sum price into major categories (e.g. engineering man-hours/costs, specialist sub-consultants, studies, etc.) for transparency. Proposal shall clearly mention the main execution center and offshore or high value center cost breakdown and manhour costs. Refer to Form C-2 in Attachment 3 for indicative rate schedule.

  Contractor shall include the pricing in a specified currency (e.g. USD is preferred) and whether it is subject to any exchange rate conditions or inflation adjustments if the FEED extends over a certain time along with all the tax considerations. Contractor shall also specify foreign exchange assumptions for EUR exposed costs.

- **Payment Schedule:** A proposed milestone payment schedule or invoicing plan for the FEED. Payments may be tied to key deliverables or progress milestones (e.g. % completion of FEED, draft deliverables, final deliverables).
- **Commercial Terms and Exceptions:** A clear statement of compliance with the RFP's commercial and contractual terms (Section 7). The bidder should explicitly confirm

acceptance of the draft contract terms provided in the attachments or enumerate any exceptions or deviations they propose. Any exceptions to terms will be considered in the evaluation and may affect the bidder's standing.

- **Technology Licensing and Royalties:** If the bidder's proposal involves any proprietary technology licenses, catalysts, or patented equipment for the LOHC process, the Commercial Proposal should outline the intended licensing terms or fees. This includes any one-time license fee for the technology usage, royalties per unit of hydrogen throughput (if applicable), or costs of proprietary catalyst supply for initial fill and subsequent operations. These costs can be presented as part of the FEED proposal or as separate information but must be clearly disclosed for North Atlantic's consideration.
- **Future EPC Phase Commitments:** While not required at this RFP stage, the bidder may provide any indicative proposal or commitments for the EPC phase to demonstrate the competitiveness of their overall offering. For example, the bidder can indicate their openness to a lump-sum EPF contract or other execution models, provide a level 4 EPF cost estimate based on current knowledge, or propose performance guarantees for the plant. Such information, if provided, will be treated as indicative and used to understand the bidder's full project capability.
- **Validity and Schedule:** State the validity period of the proposal (which should be sufficient to cover the RFP evaluation and award period, e.g. 90-120 days). Also confirm the bidder's availability to commence work immediately upon award and any assumptions on schedule (for instance, a FEED duration of X weeks from award to completion). All Commercial Proposals must be submitted separately from Technical Proposals (e.g. in a separate file or sealed envelope if physically delivered) to ensure objective evaluation. No pricing information should appear in the Technical Proposal. Proposals should be submitted by the deadline specified by North Atlantic, in the manner (electronic portal/email) indicated. Late submissions or submissions that do not follow the requirements may be disqualified. Each bidder is responsible for ensuring their proposal is complete and compliant with all requirements of this RFP.

4 Technical Deliverables (FEED Outputs)

By the conclusion of the FEED phase, each selected contractor shall produce a comprehensive set of technical deliverables. These deliverables will form the basis for the project's investment decision and the input to the EPC phase. The required FEED deliverables include, but are not limited to, the following:

- **Design Basis Memorandum:** A complete Basis of Design document covering all key design criteria for the project. This includes feed and product specifications (purity, pressure, temperature of hydrogen and LOHC at battery limits), design capacity (throughput of hydrogen to be stored/released per day or year), site conditions (environmental data, utilities available, design ambient conditions), and any specific client requirements or standards to be adhered to. This document will be the reference for all subsequent design work.
- **Process Flow Diagrams (PFDs):** Diagrams for the hydrogenation and dehydrogenation processes, showing all major equipment and process streams. Accompanied by corresponding detailed heat and material balance sheets for each major operating case (e.g. normal operation, turndown, startup/shutdown as relevant).
- **Piping and Instrumentation Diagrams (P&IDs):** Issued for Design P&IDs for all process and utility systems in the scope accompanied by line lists. These should illustrate equipment items, piping, instrumentation, control loops, safety valves, and interlocks. Each FEED package should have complete P&IDs that will later be refined in detailed design.
- **Equipment Datasheets and Specifications:** Issued for Design datasheets for all significant equipment, including reactors (hydrogenation reactor, dehydrogenation reactor), pumps, compressors, heat exchangers, pressure vessels, storage tanks, fired heaters, and filtration or purification units. Each datasheet should specify design and operating parameters, materials of construction, design codes, and utility requirements. Vendor quotes or budgetary pricing for key equipment should be obtained during FEED to support the cost estimate.
- **General Arrangement and Plot Plan:** Drawings showing the proposed layout of the facility, including equipment footprints, elevations, and routing of major piping runs. The plot plan should illustrate the optimized arrangement of the hydrogenation unit, dehydrogenation unit, storage areas for LOHC (if required), hydrogen storage (if any), flare system (if required), control room, substation, and any other ancillary facilities. Ensure that layout considerations include safety spacing, access for maintenance, and future expansion if relevant.

  Contractor shall develop FEED level 3D model (typically 30% stage) for layout, safety spacing, access, maintenance space such as exchanger bundle pulling, modularization and clash review, etc.

- **Instrumentation and Control Philosophy:** A narrative or document describing the overall control strategy for the facility, including how the two process units will be monitored and controlled. Identify the proposed automation system platform (DCS/PLC) and any advanced control or safety instrumented systems (SIS) intended. Include an alarm and safeguarding philosophy, and basic cause & effect matrices for critical shutdowns along with preliminary description (to be detailed in EPC phase).
- **Electrical and Utilities Design:** Key one-line diagrams for power distribution showing how major electrical loads (compressors, pumps, etc.) will be fed. Include load lists for electrical power and summaries of other utility consumption (water, steam, fuel gas, etc.). Specify any new utility systems or utility upgrades needed. If the project requires a power supply arrangement or backup generators, include conceptual designs for those.
- **Utility and Chemicals Summaries:** Detailed requirements of utilities and chemicals during start-up, shutdown and normal operations for ISBL facility to support the design of BoP FEED contractor.
- **Emission and Effluent Summary:** Detailed estimate of continuous and intermittent plant emissions, liquid and solid effluents.
- **Relief Load Summary:** Estimate of relief load from each of the ISBL units including preliminary datasheets of relief valves. The summary should describe various relief scenarios considered for the design.
- **Safety Studies and HSE Plan:** Documentation of the HAZOP study findings and recommendations conducted during FEED (or plan for it if scheduled late in FEED). A preliminary hazard analysis and risk assessment report covering major accident scenarios (e.g. hydrogen leaks, fires, etc.) and how the design mitigates them. Additionally, an outline of the environmental management plan, noting any emissions or effluents expected and design provisions to minimize environmental impact. Ensure compliance with all relevant safety standards (such as process safety requirements, hazardous area classification for electrical design, etc.).
- **Project Execution Plan (FEED Phase and Beyond):** A document detailing how the project can be executed in the next phases, building on the FEED results. This includes a proposed contracting strategy (if the FEED contractor were to carry on, or the strategy if it goes to market), module construction plan overview, module construction sequencing, and commissioning/startup plan at a high level. While much of execution planning will be refined post-FEED, the FEED contractor should highlight any important execution

considerations discovered during FEED (for example, any unique construction requirements for the chosen technology).

- **Project Schedule:** An updated level 3 project schedule covering the FEED work (as executed) and a proposed timeline for detailed engineering, procurement, module construction, and commissioning. This schedule should validate that the project can be delivered within the timeframe expected by North Atlantic. Key milestones (like long-lead equipment orders, permitting, etc.) should be identified.
- **Cost Estimate:** (See Section 5 for details) A detailed cost estimate for the capital project, developed to a Class 3 accuracy or better. This should include a breakdown of costs by discipline or by plant area (hydrogenation unit, dehydrogenation unit, utilities, offsites, etc.), including direct costs (equipment, bulk materials, construction labor) and indirect costs (engineering, procurement, construction management, contingencies). The estimate must be accompanied by an explanatory basis of estimate document listing the assumptions, exclusions, sources of cost data (vendor quotes, factors, benchmarks), applied contingency and its rationale, and an estimate of accuracy range.
- **Interface Register** – A Battery Limit interface tables covering all the technical interface boundaries between ISBL and OSBL areas.
- **Others:** Any additional documents and /or deliverables that are necessary to support cost estimate and for a complete FEED package, such as:
    - Line lists, valve lists, instrument indexes.
    - Preliminary piping layouts or isometrics for critical lines (if any high-risk or long-lead piping items).
    - Material selection diagrams or corrosion study results for handling hydrogen and LOHC chemicals.
    - A 3D model review summary or screenshots, to demonstrate design completeness and allow North Atlantic to visualize the facility.
    - Commissioning and Decommissioning considerations for the LOHC (like how initial fill and regeneration cycles will be handled).

All deliverables should be provided in both native format (e.g., CAD drawings, Excel datasheets or software used) and compiled format (PDF files for documents and drawings). The FEED contractors shall ensure that the deliverables are sufficiently detailed and meet industry standards so that the next phase engineering teams (whether the same contractor or others) can seamlessly take the design forward.

At the end of FEED phase, contractor shall handover all the FEED deliverables data including tag register, equipment list, line list, instrument index, I/O list in machine-readable formats.

5 Cost Estimation

A critical outcome of the FEED phase is a robust cost estimate for the LOHC facility project. Each FEED contractor is required to develop and provide a comprehensive cost estimation as part of their deliverables (referenced in Section 4). The expectations for the cost estimate are as follows:

- **Accuracy and Classification:** The cost estimate should be developed to an expected accuracy of approximately -10/+15% (typically corresponding to a Class 3 estimate as defined by AACE International or similar industry classification). The estimate should reflect the level of definition achieved during FEED and be suitable for budget authorization and investment decisions.
- **Scope Coverage:** The estimate must cover the entire scope of the project as defined in FEED, including the hydrogenation plant, dehydrogenation plant, associated utility systems and any other project components inside battery limit area (ISBL). It should also include costs for site preparation, transportation, and installation, as applicable. Contractor shall provide cost estimate for both the units separately and then provide combined cost estimate showing benefits achieved, if any due to integration of the design development and module construction.
- **Cost Breakdown:** Provide a structured breakdown of the total installed cost. This breakdown may be organized by:
- **Discipline:** e.g., civil/structural, mechanical, piping, electrical, instrumentation, etc.
- **Facility Area:** e.g., hydrogenation unit, and dehydrogenation unit.
- **Cost Categories:** e.g., equipment, bulk materials, labor, engineering, construction management, contingency, etc. The breakdown should be detailed enough to facilitate analysis and understanding of cost drivers.
- **Basis of Estimate:** Accompany the numerical estimate with a Basis of Estimate (BOE) document as follows:
    - Base currency (USD / CAD) for all costs.
    - Base date clearly stated.
    - FX assumptions for EUR-denominated costs.
    - Sensitivity analysis for FX variations.
    - Clear statements regarding duties, customs and indirect taxes.

- Explicit listing of exclusions, owner-furnished items and assumptions.

The BOE should clearly state all assumptions and inclusions, such as: design basis for costing (capacity, design conditions), source of pricing data (vendor quotes for major equipment, cost databases for bulk materials and labor unit rates, etc.), assumed labor productivity and working hours, any location factors or adjustments used (without naming specific countries, just general conditions), contingency philosophy, and escalation if assumed. Note any costs excluded (e.g., land acquisition, certain owner costs like licensing fees if not included, etc.) and any specific risk allowances.

- **Operational Costs Estimate:** In addition to CAPEX, provide an estimate or analysis of expected operational costs (OPEX) for the facility. This includes estimated utilities consumption (and costs), catalyst or chemical consumption (e.g. periodic replacement of LOHC or catalyst if applicable), manpower requirements for operation, maintenance costs, etc. This information will help in evaluating the life-cycle cost effectiveness of the proposed technology.
- **Validation and Benchmarking:** The contractor should perform basic validation on the estimate, such as benchmarking key metrics (e.g., cost per ton of hydrogen storage capacity, or per kW of throughput) against industry data or similar projects (if available). All such comparisons should be presented in generic terms without reference to specific projects. Identify any areas of significant cost uncertainty or potential opportunities for cost optimization that were observed during FEED.
- **Review and Iteration:** The cost estimate should undergo the contractor's internal review process (with cross-discipline input) to ensure completeness. The final estimate will be reviewed with North Atlantic as part of the FEED completion, and contractors should be prepared to discuss and justify the estimate details. North Atlantic may engage an independent reviewer to audit the estimates from both FEED contractors for fairness and accuracy.

The cost estimation deliverable will play a significant role in the final selection of the implementation contractor. Bidders are thus expected to put forward their best effort in providing a reliable and well-documented estimate. North Atlantic emphasizes transparency in the estimate; any use of allowances or factors should be clearly explained. The currency for all cost reporting shall be [specified currency, e.g., USD], and costs should be based on price levels of 2026. No

inflation escalation should be included beyond this point for comparison purposes, unless specifically requested by North Atlantic.

6 Execution Approach

This section describes the intended project execution strategy and how the dual FEED process will be managed by North Atlantic. Bidders should read this carefully, as it sets the context for how their work will feed into the larger project timeline and decision-making process.

North Atlantic's current intent is to select one FEED contractor as preferred EPC / EPF contractor following dual FEED completion, subject to performance and commercial agreement. North Atlantic reserves the right to tender EPC separately if in its best interest.

- **Dual FEED Competition Structure:** North Atlantic plans to award FEED contracts to two separate contractors (as a result of this RFP) to pursue parallel FEED studies. Both contractors will work over the same timeframe, starting concurrently, to develop their respective designs and deliverables independently. Each contractor will utilize its own technology and expertise for the LOHC hydrogenation and dehydrogenation processes. North Atlantic will ensure a fair and confidential competitive environment; no exchange of proprietary information will occur between the two FEED contractors. Periodic progress meetings may be held, but they will be separate for each contractor to protect competitive data.
- **FEED Timeline and Coordination:** The expected duration of the FEED phase is approximately 6 months or better from kick-off to final deliverables. During this period, North Atlantic will assign a dedicated owner's team to interface with each FEED contractor. Regular coordination meetings (e.g., weekly progress calls and monthly formal reviews) will be conducted to monitor progress, clarify any questions, and ensure alignment with project objectives. Key milestones during FEED may include Kick-off Meeting, Design Basis Freeze, Mid-way Design Reviews (PFD, P&IDs, Single Line Diagrams, etc.), HAZOP completion, 3D Model Review (as applicable), Draft Deliverables Submission, and Final FEED Completion Review.
- **Interim Deliverables and Reports**: Each FEED contractor will be expected to submit interim deliverables or summary reports at defined milestones (for instance, a 30% design review package or a preliminary cost report mid-way through FEED). This allows North Atlantic to track whether the designs are evolving in a direction that meets the project requirements. Feedback from North Atlantic at these stages will be provided separately to

each contractor, focusing on clarifications or requested adjustments, without revealing any competitive information.

- **Evaluation and Down-Selection:** Upon FEED completion, both contractors will have delivered their FEED packages including technical designs, cost estimates, and execution plans. North Atlantic will then conduct a thorough evaluation of the outcomes. Criteria will include technical viability, cost-effectiveness, execution risk, and alignment with the north Atlantic's strategic goals (the same general areas outlined in Section 8 for proposal evaluation will also guide the FEED outcome evaluation). North Atlantic's intent is to select one of the FEED contractors to proceed to the next phase of the project, which could be a direct award of an EPF contract or a separate tender for EPC where the FEED contractors may have an advantage.
- **Post-FEED Implementation:** The contractor selected to continue will likely enter into negotiations for an EPF (or EPC) contract to execute the project, using their FEED as the basis. At that stage, any remaining design optimization, detailed engineering, procurement, and module construction will be carried out. The FEED contractor not selected will be compensated as per the terms of the FEED contract for the scope delivered but will not proceed to execution. North Atlantic may consider an honorarium or partial compensation for the unsuccessful FEED contractor's efforts (if such terms are defined in the contract) to acknowledge their participation and the value of their work.
- **Technology and Intellectual Property:** During execution, any proprietary technology information provided by either FEED contractor will remain confidential. North Atlantic will ensure that intellectual property rights are respected: the selected design will be used solely for North Atlantic's project implementation. North Atlantic will not share or use the losing contractor's detailed design for execution, beyond extracting any general lessons or data that are not proprietary. Bidders should be assured that the dual FEED approach is intended to select the best solution, not to mix designs or divulge trade secrets.
- **Future Collaboration:** North Atlantic encourages both FEED contractors to maintain a collaborative stance with North Atlantic throughout the FEED. In case the project scope is expanded or if future similar projects arise, there may be opportunities for both contractors beyond this specific competition. Thus, even though this is a competitive FEED, maintaining professionalism and quality throughout is in the long-term interest of all parties.

The above approach is provided to ensure transparency on how the dual FEED will be executed. Bidders should align their proposals and internal planning to this execution strategy. Any concerns or suggestions regarding the execution approach can be addressed during the RFP clarification period prior to the proposal submission deadline.

7 Commercial Terms

This section summarizes key commercial and contractual terms that will govern the FEED contracts and highlights important conditions for this RFP. Bidders must carefully review these terms and ensure their Commercial Proposals are compliant or note any exceptions explicitly.

- **Contract Structure:** The contract awarded for the FEED services to each selected bidder will be a standalone agreement based on a bidder's standard FEED contract format. It is anticipated to be a fixed-price (lump sum) contract for the defined FEED scope. Bidders should account for all costs in their lump sum price, as no additional compensation will be provided for completing the scope aside from agreed variations.
- **Payment Terms:** Payments for FEED services will be made against milestones or progress as outlined in the contract. Bidders may propose a milestone payment schedule in their Commercial Proposal, which will be subject to negotiation. Typically, a portion of the payment is tied to contract award/kickoff (mobilization), with subsequent payments upon intermediate deliverables and a final payment upon acceptance of all FEED deliverables. North Atlantic may retain a small percentage of each payment (retainage) until final completion as a performance security.
- **Confidentiality and Data Use:** All data provided by North Atlantic to bidders (including in this RFP and attachments) and all data developed by contractors during FEED must be kept confidential and used solely for the purposes of this project. The FEED contract will include confidentiality provisions binding the contractor. Similarly, North Atlantic will treat the bidders' proprietary technical information confidentially. Both FEED contractors will be required to operate independently and not disclose any information to each other.
- **Intellectual Property Rights:** Any intellectual property (IP) or proprietary technology brought by the contractor for the purpose of the project remains the property of the contractor or technology provider. However, all FEED work products (documents, models, drawings, calculations) developed under the FEED contract will become the property of North Atlantic upon payment. North Atlantic will receive an unrestricted right to use the FEED deliverables for executing the project. If licenses are required for the technology to

build or operate the facility, the commercial terms of such licenses should be identified in the proposal and will be included in the contract negotiations.

- **Liabilities and Warranties:** The FEED contract will define the liability of the contractor for its work. Bidders shall state their standard liability positions, and professional indemnity limits/duration. Typically, the contractor will be liable for the consequences of errors or omissions in the FEED deliverables. Bidders should carry professional indemnity insurance and provide proof of such insurance if requested. The FEED contract may also include warranties that the work is performed in a professional manner and that the deliverables will meet the specified requirements. Any performance guarantees for the technology (e.g. efficiency, capacity) will primarily be formalized in the subsequent EPC phase, but bidders should stand behind the technical viability of their FEED designs.
- **Governing Law and Arbitration:** The contract and all matters arising in connection herewith, including validity and enforcement, will be governed by, interpreted and construed in accordance with the laws of the Province of Newfoundland and Labrador, without giving effect to any conflicts of laws principles that would result in the application of a different law. Disputes that cannot be resolved amicably will be settled by arbitration under a recognized international arbitration body or rules. Bidders shall accept the proposed governing law and dispute resolution mechanism.
- **Health, Safety, Security & Environment (HSSE):** Contractors must perform their work in compliance with all applicable HSSE laws and regulations. While most FEED work is office-based, if any site visits or field work is required during FEED, the contractor must adhere to North Atlantic's safety requirements. No alcohol, drugs, or other prohibited activities are allowed on site. The contract will include standard HSSE requirements, and the contractor shall have to provide an HSSE plan if performing any on-site activities.
- **Code of Conduct and Compliance:** Bidders and their personnel must conduct business in a responsible and ethical manner. North Atlantic expects compliance with anti-bribery, anti-corruption laws (e.g., not offering any inducements to North Atlantic employees or stakeholders), and adherence to international standards for business conduct. The contract will have clauses addressing these compliance requirements. Any conflict of interest must be disclosed. North Atlantic reserves the right to disqualify a bidder or terminate a contract if any compliance violations are discovered.
- **Reservation of Rights:** North Atlantic reserves the right to accept or reject any and all proposals, to negotiate contract terms with the selected bidders, and to award or not award the FEED contracts at its sole discretion. Issuance of this RFP and even selection of

contractors for FEED does not commit North Atlantic to proceed with the project to EPC or beyond. North Atlantic may also choose to terminate the project or the FEED contracts at any stage, subject to fair compensation for work done, if business circumstances warrant.

- **Clarifications and Amendments:** Bidders may seek clarification on the RFP by submitting questions in writing by the date specified (in the RFP schedule or instructions). North Atlantic will issue clarifications or amendments to all bidders to ensure a fair and transparent process. All such addenda become part of the RFP requirements and must be acknowledged in the proposal. Bidders are advised to regularly check for any updates before finalizing their submissions.

Bidders should review the attached draft contract and ensure that their proposals either accept the terms or flag specific exceptions. Extensive exceptions or unwillingness to adhere to standard terms may result in a proposal being considered less favorable. North Atlantic aims to establish a fair contract that protects both parties and ensures a successful partnership through FEED and potentially into project execution.

8 Evaluation Criteria

The selection of the two FEED contractors through this RFP will be based on a multi-criteria evaluation to determine the best overall value to North Atlantic. The proposals will be evaluated by an evaluation committee against the following criteria (not necessarily listed in order of importance, unless weightings are specified):

- **Technical Capability and Solution (Technology Merit):** Evaluation of the proposed LOHC technology and design approach. This includes the efficiency and reliability of the hydrogenation/dehydrogenation process, the maturity of the technology (proven track record vs. novel approach), and how well the proposed design can meet the specific project requirements (capacity, safety, operability w.r.t wind power without energy storage). Bidders offering a robust, proven technology with clear advantages (e.g., higher hydrogen storage density, lower energy consumption, etc.) will be rated highly.
- **Execution Plan and Schedule:** The quality and credibility of the bidder's FEED execution plan. This covers the proposed schedule (e.g. can the FEED be completed within the required timeframe?), the adequacy of the project team (skills and experience of key personnel), resource allocation, and the approach to managing the FEED work (including

interface management and risk mitigation). A realistic schedule and a well-structured plan indicating a clear path to deliverables will score well.

- **Experience and Track Record:** The bidder's experience with projects of similar nature and scale. This includes successful completion of FEED and EPF for related process plants (especially hydrogen-related or chemical process facilities). The expertise in LOHC or hydrogen technologies, and general engineering performance demonstrated in past projects, will be considered. Client references or performance on past projects (if known to North Atlantic or provided in the proposal) will also influence this criterion.
- **Commercial Offer:** The competitiveness and completeness of the Commercial Proposal. A key factor is the lump sum price for FEED services – North Atlnatic will evaluate whether it is reasonable and within budget expectations. However, the lowest price will not automatically win; price will be considered in relation to the overall value and quality offered. The proposed payment schedule, any exceptions to contract terms, and any cost-saving offers for the EPF/EPC phase (if provided) will also be taken into account.
- **Life-Cycle Considerations:** Though the immediate selection is for FEED, North Atlantic will consider the implications of each bidder's proposal on the overall project life-cycle. This includes the anticipated capital and operating costs of the final facility (from the provided technology and initial cost estimates), the ease of implementation (construction and startup considerations), and long-term operability/maintainability. A proposal that might have a higher FEED cost but leads to a significantly more economical or lower-risk project execution could be favored.
- **Compliance and Quality of Proposal:** The degree to which the bidder's proposal adheres to the RFP instructions. A well-organized, clearly written, and complete proposal that addresses all requirements is essential. Proposals that contain ambiguities, omissions, or deviations without explanation may be scored lower. The responsiveness during the RFP process (such as timely clarification questions and professional communication) will also reflect the bidder's commitment and competence.
- **Safety and ESG (Environmental, Social, Governance):** The emphasis the bidder places on safety in design and their track record for safety in engineering projects. Additionally, North Atlantic may consider the bidder's corporate commitment to sustainability and any innovative ideas to minimize the environmental footprint of the project (for instance, energy optimization in the process, use of waste heat, recyclability of the LOHC material, etc.). While these may not be primary selection criteria, a strong safety culture and alignment with North Atlantic's ESG values can distinguish a proposal.

North Atlantic may assign weighted scores to these criteria or use a qualitative ranking process.

Indicative evaluation weightings are as below:

- Technical Capability & Technology Merit – 25%
- Execution Strategy & Schedule – 20%
- Relevant Experience & Team Strength – 15%
- Commercial Offer – 30%
- HSSE & ESG Alignment – 10%

Bidders shall complete the Compliance Matrix (Attachment 3).

Bidders might be invited to an interview or clarification meeting as part of the evaluation, where they can present their proposal and address questions. Ultimately, North Atlantic will select the two proposals that are deemed most advantageous, balancing both technical excellence and cost considerations.

All bidders will be notified of the outcome of the RFP. After selection, North Atlantic may offer a debrief to unsuccessful bidders upon request, to provide feedback (in general terms) on areas for improvement. North Atlantic appreciates the effort involved in preparing these proposals and will conduct the evaluation in a fair and confidential manner.

9 Attachments

The following attachments are listed, and some are included with this RFP to provide additional information and templates to assist bidders in preparing their proposals. Bidders should ensure they have received all documents and should incorporate the requirements and information from these attachments into their response where applicable:

- **Attachment 1: Design Basis** – Detailed project description, design basis data, and technical requirements for the LOHC facility. This document includes specifics such as hydrogen supply details, required hydrogen output specifications, preliminary site information, environmental conditions, and any predefined design standards or codes to be followed.
- **Attachment 2: FEED Deliverables List and Format Guidelines** – A list of minimum required FEED deliverables (expanding on Section 4) with expected number of revisions to ensure consistency between the two FEED contractors. Contractor may propose any additional deliverables that may be required for complete FEED package.

- **Attachment 3: Proposal Templates and Forms** – A list of forms for inclusion in proposal submission, which may include a pricing breakdown form, a compliance matrix for RFP terms (where bidders indicate their compliance or exceptions to each item), and any required declarations (e.g., a no-conflict-of-interest declaration). Bidders should use these forms, where provided to structure their proposals.
- **Attachment 4: Draft FEED Contract Terms and Conditions** – A draft version of the contract terms that will be included in the signed contract with the selected FEED contractors shall include the general terms highlighted in Section 7, as well as project-specific clauses. Bidders must review these contract requirements and include any comments or requested modifications as part of their proposal (as noted in Section 3.2, Commercial Proposal).
- **Attachment 5**: **Health, Safety, Environment and Quality (HSEQ) Questionnaire** – A mandatory corporate HSEQ form is peovided. f applicable, any additional attachments such as HSE requirements, design standards, etc., would be listed here.

This RFP document, along with its attachments, constitutes the complete set of requirements for the Dual FEED for the LOHC facilities project. Bidders are expected to carefully review all sections and attachments. North Atlantic looks forward to receiving well-prepared proposals from capable bidders and proceeding with the successful execution of the dual FEED process.

Attachment 1: Design Basis

Provided as a Separate Document

Attachment 2: FEED Deliverables List, Format Guidelines and Minimum Number of Revisions

Structure, Drafting, and Review Requirements

1. Language: English
2. Units: SI (mandatory)
3. Drawing Format: ISO A-series / PDF and native
4. Document Control:
    a. Title block with: Document Number, Revision, Date, Author, Checker, Approver
    b. Revision history with description of changes
    c. “Issued for FEED” stamp
5. 3D Model Requirements:
    a. AVEVA E3D or equivalent
    b. 30% FEED design review snapshots
    c. Model export in IFC format

FEED Deliverables Register (Full List)

Table A2.1 Project Management and Execution

Deliverable	Description	Format
Project Execution Plan (PEP)	Full FEED execution methodology	PDF + Native
Interface Management Plan	Interfaces between hydrogenation/dehydrogenation units, utilities, FEED contractor and owner teams	PDF
Risk Register & Mitigation Plan	Identification and ranking of risks with mitigation actions	Excel + PDF
FEED Schedule (Level 3)	Resource-loaded schedule; critical path	Primavera (.xer) + PDF
FEED Progress Reports	Monthly progress; S-curves; risks	PDF
Change Management Procedure	FEED variation control	PDF

Table A2.2 Process Engineering

Deliverable	Description
Design Basis Memorandum	Process, operating, and design criteria
Process Design Criteria	Codes and Design Margins
Process Flow Diagrams (PFDs)	With stream tables and H&MBs
Heat & Material Balances	For all cases: normal, turndown, startup

Deliverable	Description
Piping & Instrumentation Diagrams (P&IDs)	All systems, including shutdown functions
Process Descriptions	Narrative per unit
Utility Summaries	Electrical load, cooling, heating, instrument air
Chemicals Summary	Various chemicals required as dosing or for catalyst activity and performance etc...
Emissions and effluent Summary	Continuous or intermittent gaseous emissions and any liquid effluent discharges.
Process Safeguarding Memorandum	Overpressure protection, relief philosophy
Cause & Effect Diagrams (C&E)	Facility-level shutdowns
Relief Load summary and Calculations	For all PSVs
Control Philosophy	DCS/PLC, SIS architecture
Hazardous Area Classification	Drawings + basis
Process Simulation Files	Fully converged cases

Table A2.3 Mechanical Engineering

Deliverables	Content
Mechanical Equipment Datasheets	All major equipment
Mechanical Design Criteria	Codes, materials, design temperature/pressure
Rotating Equipment Specification	Compressors, pumps
Static Equipment Design	Vessels, reactors, tanks
Fired Heater/Dehydrogenation Heater Specs	Fired heaters
Materials Selection Diagram	Material Selection
HVAC Engineering	Load and equipment lists

Table A2.4 Piping Engineering

Deliverable	Description
Piping Material Class Index	Full MOC and ratings
Line List	All lines tagged, sizes, MOC
Valve List	Type, MOC, class

Deliverable	Description
Tie-in List	All battery limits
Specialty Items List	All piping speciality items
Battery Limit Interface Tables	List of all pipelines in and out of the unit
Plot Plan	Full site layout
3D Piping Model Snapshots	30/60/90% as applicable.
Stress Analysis Reports	Critical lines

Table A2.5 Electrical Engineering

Deliverable	Description
Electrical Design Criteria	Codes and Standards, Power System Philosophy
Electrical Load List	All equipment
One-Line Diagrams	MV/LV systems
Substation Layout	If applicable
Earthing Study	Calculations + layout
Cable Routing Plan	Trays, sizing, segregation
Hazardous Area Electrical Review	Compliance

Table A2.6 Instrumentation & Control

Deliverable	Description
Instrumentation Design Criteria	Codes and Standards, Control System Philosophy
Instrument Index	Complete list
I/O List	With DCS/SIS segregation
Control Narratives	All process units
SIS Architecture & SIL Assessment	LOPA results
Instrument Datasheets	All field devices
Interlocks and Logic Diagrams	Shutdown, permissive logic

Table A2.7 Civil/Structural

Deliverable	Description
Design Basis	Contractor to provide required information for BoP FEED contractor such as Loads, etc.
Geotechnical Interpretation	From owner's survey
Foundation Design	Contractor to provide required FFED level civil load information to BoP FEED contractor
Structural Steel Plans	Units, pipe racks
Roads, Drainage, Paving Layout	By BoP FEED contractor. Contractor to provide required information.

Table A2.8 Safety & Environment

Deliverable	Description
HAZID Report	Early-phase hazard identification
HAZOP Report	Full node-by-node
LOPA Report	SIL assignment
Quantitative Risk Assessment (QRA)	Fire/explosion modeling
Environmental Impact Memorandum	Emission sources and controls
Fire Protection Layouts	F&G device, hydrants, extinguishers

Table A2. 9 Cost & Estimating

Deliverable	Description
Class 3 CAPEX Estimate	-10/+15%
BOE (Basis of Estimate)	Assumptions, factors
Vendor Quotes (Major Equipment)	3 competitive quotes (where possible)
OPEX Estimate	OPEX

Table A2.10 FEED and EPF Schedule

Deliverables	Description
FEED Schedule – Level 3	Proposed FEED schedule for FEED execution
EPF Schedule – Level 3	Expected EPF Schedule after FEED

Table A2.11 FEED Reports

Deliverables	Description
FEED Report	Full FEED Report (Master Document)
Execution Recommendations	Proposed Project execution recommendations
Key Design Decisions Register	
Detailed Design Work Scope	Scope for EPF Model Execution

Table A2.12 FEED Deliverables – Owner Minimum Requirements

Project Management				
Deliverable	IFR	IFA	IFD	IFI
Project Execution Plan	✓	✓		
Interface Management Plan		✓		
Risk Register & Mitigation Plan		✓		
FEED Schedule (Level 3)	✓		✓	
FEED Progress Reports		✓		
Change Management Procedure		✓		
Process Engineering				
Deliverable	IFR	IFH	IFD	IFI
Design Basis Memorandum	✓		✓	
Process Design Criteria	✓		✓	
Process Flow Diagrams	✓		✓	
Heat & Material Balances	✓		✓	
Piping & Instrumentation Diagrams	✓	✓	✓	
Process Description	✓		✓	
Utility Summary	✓		✓	
Chemicals Summary	✓		✓	
Emissions and Effluent Summary	✓		✓	
Process Safeguarding Memorandum	✓	✓	✓	
Cause & Effect Diagrams	✓	✓	✓	
Relief Load Summary and Calculations	✓		✓	
Control Philosophy	✓	✓	✓	
Hazardous Area Classifications	✓		✓	

Deliverable	IFR	IFH	IFD	IFI
Process Simulation Files				✓
Mechanical Engineering				
Deliverable	IFR	IFH	IFD	IFI
Mechanical Equipment Datasheets	✓		✓	
Mechanical Design Criteria	✓		✓	
Rotating Equipment Specification	✓		✓	
Static Equipment Design	✓		✓	
Fired Heater / Dehydrogenation Heater Specifications	✓		✓	
Material Selection Diagram	✓		✓	
HVAC Engineering	✓		✓	
Piping Engineering				
Deliverable	IFR	IFH	IFD	IFI
Piping Material Class index	✓		✓	
Line List	✓	✓	✓	
Valve List	✓		✓	
Tie-in List	✓		✓	
Specialty Items List	✓		✓	
Battery Limit Interface Tables	✓		✓	
Plot Plan	✓		✓	
3D Piping Model Snapshots	✓			
Stress Analysis Reports	✓		✓	
Electrical Engineering				
Deliverable	IFR	IFH	IFD	IFI
Electrical Design Criteria	✓		✓	
Electrical Load List	✓		✓	
One-Line Diagrams	✓		✓	
Substation Layout	✓		✓	
Earthing Study	✓		✓	
Cable Routing Plan	✓		✓	
Hazardous Area Electrical Review	✓		✓	

Instrumentation & Control				
Deliverable	IFR	IFH	IFD	IFI
Instrumentation Design Criteria	✓		✓	
Instrument Index	✓		✓	
I/O List				✓
Control Narratives	✓	✓	✓	
SIS Architecture & SIL Assessment	✓		✓	
Instrument Datasheets	✓		✓	
Interlocks and Logic Diagrams	✓	✓	✓	
Civil / Structural				
Deliverable	IFR	IFH	IFD	IFI
Design Basis	✓		✓	
Geotechnical Interpretation	✓			
Foundation Design	✓		✓	
Structural Steel Plans	✓		✓	
Roads, Drainage, Paving Layout	✓		✓	
Safety & Environmental				
Deliverable	IFR	IFH	IFD	IFI
HAZID Report	✓		✓	
HAZOP Report	✓		✓	
LOPA Report	✓		✓	
Quantitative Risk Assessment	✓		✓	
Environmental Impact Memorandum	✓		✓	
Fire Protection Layouts	✓		✓	
Cost & Estimating				
Deliverable	IFR	IFH	IFD	IFI
Class 3 CAPEX Estimate	✓		✓	
Basis of Estimate	✓		✓	
Vandor Quotes (Major Equipment)	✓			
OPEX Estimate	✓		✓	

FEED Reports				
Deliverable	IFR	IFH	IFD	IFI
Final FEED Report (Master Document)	✓		✓	
Execution Recommendations	✓			
Key Design Register	✓			

*IFA – Issued for Approval, IFD – Issued for Design, IFH – Issued for HAZOP, IFI – Issued for Information, IFR – Issued for Review.

Attachment 3: Proposal Template and Forms

Bidders must complete and submit the following forms.

Bidder's Compliance Matrix

Bidders must complete the following table showing compliance vs deviations.

RFP Section	Requirement Summary	Complies? (Y/N)	Bidder Comment
Section 2	Complete FEED scope	Y/N	
Section 3	Dual FEED confidentiality	Y/N	
Section 4	Full deliverables submission	Y/N	
Section 7	Contract terms	Y/N	
Attachment 4	FEED contract acceptance	Y/N	

Bidder's Technical Forms

Form T-1: Bidder Experience Summary

Project Type	Year	Scope	Key Achievements	Client (Generic)
…	…	…	…	…

Form T-2: Key Personnel List

Position	Name	Experience (years)	Relevant FEED Experience	Availability (%)
…	…	…	…	…

Form T-3: Technology Summary

Indicative parameters are shown below, Bidder is free to update it with relevant parameters as applicable to the technology.

Parameter	Bidder Value	Notes
Hydrogenation Conversion (%)		
Dehydrogenation Efficiency (%)		
Energy Consumption (kWh/kg H2)		
LOHC Degradation Rate (%)		
Catalyst Life (years)		

In lieu of the above table, bidder may submit the key technology summary as deemed applicable.

Bidder's Commercial Forms

Bidder shall submit the following forms as mentioned below in bidder's format. The minimum information required to be included is as listed in each of the sections. Some of the forms are also included for reference.

Form C-1: Lump-Sum FEED Pricing

Cost Category	Amount
Engineering Man-hours	
Specialist Subcontractors	
Studies & Safety	
Travel & Expenses	
Overheads & Profit	
TOTAL FEED PRICE	

Form C-2: Indicative Rate Schedule

Items	Hydrogenation Plant (40 hour / Week)	Dehydrogenation Plant (40 Hour / week	FEED Total (40 hour/week)
1 Project Management			
2 Risk Management			
3 Quality Management			
4 Project Controls			
4.1 Planning and Scheduling			
4.2 Cost Estimating			
5 Engineering			
5.1 Engineering Management			
5.2 Process Engineering			
5.3 Geotechnical Engineering			
5.4 CSA Engineering			
5.6 Mechanical Engineering			
5.7 HVAC			
5.8 Piping Engineering			
5.9 Process, Environment and Fire Safety			
5.10 Electrical Engineering			
5.11 Control and Automation Engineering			
6 Procurement & Logistics			
7 Construction Management			
8 Information Management			
9 Document Management			
10 Any Other Function			
TOTAL			

NOTE 1: Rate sheet at each location of work should be provided.
NOTE 2: Bidder to expand rate for each discipline by grade level.

Form C-3: Payment Milestones

Milestone	Deliverable	% Payment
Kickoff	Mobilization	X%
30% Package	Design Basis, PFDs and HMB	X%
60% Package	P&IDs, Plot Plan	X%
90% Package	Cost Estimate	X%
Final FEED	All FEED Deliverables - final	X%

Form C-4: Exceptions to Contract

Clause	Bidder Exception	Proposed Alternative
…	…	…

Form C-5: Technology Licensing Declaration

Bidders must declare:

- Whether FEED includes technology license
- Any license fee (one-time)
- Any royalty or catalyst proprietary requirements

Attachment 4: Draft FEED Contract Terms and Conditions

Contract Type

- Lump-sum FEED contract
- No adjustment except agreed variations

Contractor Obligations

Contractor shall:

- Perform FEED with due professional care
- Provide competent personnel
- Maintain quality systems
- Deliver all FEED documents complete and on time
- Coordinate with North Atlantic's FEED oversight team
- Maintain confidentiality and data protection

North Atlantic Obligations

North Atlantic shall:

- Provide input data, site information
- Review submissions in 10 working days
- Pay invoices per payment schedule
- Provide timely clarifications

Schedule & Deliverables

- Contractor shall meet the FEED schedule
- Delays attributable to Contractor may trigger LDs (liquidated damages)
- Deliverables as per Attachment 2

Payment Terms

- Milestone-based
- Invoices payable net 30 days
- Retainage: 5% until FEED acceptance

Variations

- Any change to the FEED scope requires written North Atlantic approval
- Variation orders must include:

- Change description
- Cost and schedule effect
- Revised deliverables

Intellectual Property

- Contractor retains IP in proprietary technology
- North Atlantic owns all FEED deliverables
- North Atlantic granted perpetual right to use FEED outputs

Confidentiality

- Both parties must protect confidential data
- No distribution without permission
- Dual FEED contractors must operate independently

Liability & Insurance

- Contractor liable for errors/omissions up to 100% of FEED contract value
- Mandatory insurance:
  - Professional liability
  - Employer liability
  - General liability

Termination

North Atlantic may terminate:

- For convenience (with compensation)
- For cause (non-performance)

Contractor may terminate only for North Atlantic material breach.

Governing Law & Disputes

- Governing law: Specified by North Atlantic
- Dispute resolution:
  - Negotiation
  - Senior management meeting
  - Arbitration (ICC or UNCITRAL recommended)

HSSE Requirements

Contractor must comply with:

- All HSSE rules
- Safety training for any site visits
- No work permitted without approved HSSE plan

Code of Ethics

Contractor must maintain:

- Anti-corruption compliance
- Anti-bribery compliance
- Conflict of interest disclosure

Breaches may result in termination.

Attachment 5: Health, Safety, Environment and Quality (HSEQ) Questionnaire

Health, Safety, Environment and Quality (HSEQ) Questionnaire

Please complete the relevant sections. If a question is not applicable to the scope of work, please mark "NA".

Company Information

Company Name	
Address	
Contact Name	**Title**
Telephone	**E-mail**
Number of Employees	

Please list or attach any additional information you feel is relevant in demonstrating Health, Safety, Environment and Quality Management

Quality Management

Have you implemented a Quality Management System?	☐ Yes ☐ No
Is your company registered to ISO 9001 or other recognized standard? *Please provide a copy of certificate(s).*	☐ Yes ☐ No
If "No", is your system compliant to ISO 9001 requirements?	☐ Yes ☐ No

If you do not have a Quality Management System, what processes and practices do you have in place to ensure that you are capable of meeting contractual requirements, including those relating to product or service quality.

What is your process for management of changes?

How do you identify problems that have the potential to affect your customer deliverables?

Please provide a copy of your Quality Policy, if available

Health, Safety & Environmental Management

Have you implemented an Occupational Health & Safety Management System?	☐ Yes ☐ No
Have you implemented an Environmental Management System?	☐ Yes ☐ No

To which standards and regulatory requirements does your system comply (e.g. ISO 45001, PRIME, COR, ISO 14001, etc.) *Please provide a copy of certificate(s) if relevant.*

North Atlantic	Health, Safety, Environment and Quality (HSEQ) Questionnaire

Please provide a copy of:

- Health and Safety Policy
- Environmental Management Policy
- Drug and Alcohol Policy

Will your employees or subcontractors be visiting North Atlantic worksites or the worksite of North Atlantic's customers? If "Yes" please provide copies of: ☐ Yes ☐ No

- Certificate of Insurance
- Workplace NL Letter of Clearance
- Applicable training certificates

Does your company have a competency assurance and training program in place to ensure that personnel are qualified and competent to perform their work safely? ☐ Yes ☐ No

Does your company have a maintenance program to ensure that equipment is safe and fit for purpose? *Please provide details.* ☐ Yes ☐ No

How are health, safety and environmental risks and controls identified, controlled and communicated. *Please provide details of procedures and processes.*

Does your company identify potential environmental impacts associated with your work and operations? *Please provide details.* ☐ Yes ☐ No

Does your company have processes in place to ensure the protection and security of products, premises and client information? *Please provide details.* ☐ Yes ☐ No

Supplier / Contractor Statement			
All of the information provided in this document and attachments is complete, true and correct. I am authorized by my company to provide this information.			
Name		**Title**	
Email		**Telephone**	
Signature		**Date**	
Comments:			